Nunavut Communicable Disease and Surveillance Manual

Contents

10.0 Vectorborne and Zoonotic Infections

11.0 Other

12.0 Forms

1.0 Introduction to the Nunavut Communicable Disease and Surveillance Manual

Purpose

The purpose of this document is to present the basic protocol for public health investigation, management and reporting of communicable diseases and outbreaks in Nunavut. It provides a quick snap shot of the steps involved and the roles and responsibilities at each level of the system, e.g. community, regional and territorial level.

The primary public health objective of investigation and management of communicable disease is to prevent transmission to others. This is done by early identification of cases through mandatory reporting of these diseases and careful public health follow-up of cases and contacts. The outbreak investigation and management protocols are activated when an unusual number of cases of a communicable disease occurs.

Principles

A hardcopy of the Communicable Disease and Surveillance Manual is available in every community health centre and public health centre in Nunavut as well as Qikiqtani General Hospital. It is also accessible online at the Nunavut Department of Health website: http://www.gov.nu.ca/health

As the practice of public health surveillance and disease management constantly evolves with new information, the documents included in this manual will be evergreen and updated as needed. The updated documents will be sent in hardcopy to the health centres and will be uploaded onto the Nunavut Department of Health website in a timely manner.

The diseases included in this Manual are categorized into the following sections:

- Enteric, Food and Waterborne
- Blood-Borne
- Sexually Transmitted
- Vaccine Preventable
- Direct Contact
- Respiratory
- Vectorborne and Zoonotic
- Other

Although some diseases may belong to more than one section, each disease has been categorized into only one section for ease of use. Each section includes public health directives and roles and responsibilities of public health staff, as well as public health protocols, report forms, fact sheets where applicable, and additional information if needed for each disease in the section.

2.0 Public Health Investigation, Management and Reporting of Communicable Diseases and Outbreaks in Nunavut

2.1 Legislative Authority

Communicable diseases are those that are listed in the Communicable Disease Regulations of the Public Health Act as diseases that a medical practitioner, nurse, laboratory, or dentist is required by law to report to the Chief Medical Officer of Health (CMOH). The list of communicable diseases in Nunavut can be found in Table 2.1. This list is currently being updated as part of the work on developing a new Public Health Act for Nunavut.

Reports (with non-identifiable information) are subsequently made to the Public Health Agency of Canada (PHAC) and the International Circumpolar Surveillance System (ICS) for the specific diseases established by agreements with PHAC and ICS.

The CMOH has significant authority under the Public Health Act to ensure that individuals with communicable diseases are followed up and advised to take steps to prevent transmission to others.

Individuals required to report cases of notifiable diseases and conditions must provide the office of the CMOH all relevant demographic, clinical, personal, and epidemiological details. The CMOH may also request any additional information (e.g. copies of class lists, absentee reports, daily logs, etc.) required to complete the necessary follow-up.

Table 2.1 Reportable Diseases in Nunavut (as per the 1990 *Public Health Act*, amended January 6, 2000)

Reportable Diseases in Nunavut
(as per the 1990 *Public Health Act*, amended January 6, 2000)

SCHEDULE A – Item I

Reportable to Chief Medical Health Officer by telephone as soon as suspected and followed **within 24 hours** by a written report.

1. Amoebiasis
2. Anthrax
3. Botulism
4. Campylobacteriosis
5. Cholera
6. Diphtheria
7. *E. coli* (verotoxigenic)
8. Food Poisoning
   - I. Staphylococcal
   - II. *Bacillus cereus*
   - III. *Clostridium perfringens*
   - IV. Other and undetermined
9. Gastroenteritis, epidemic (including institutional outbreaks)
10. Hantaviral Disease (including Hantavirus Pulmonary Syndrome)
11. Hemorrhagic fevers
12. Hepatitis (all forms)
13. Invasive *Streptococcus pneumoniae* infection
14. Influenza
15. Invasive Group A Streptococcal infections (including Toxic Shock Syndrome, necrotizing fascitis, myositis and pneumonitis)
16. Invasive *Haemophilus influenzae* type B (HiB) infections
17. Invasive *Neisseria meningitidis* infections
18. Legionellosis
19. Malaria
20. Measles
21. Meningitis/Encephalitis
22. Neonatal group B Streptococcal infections
23. Pertussis (whooping cough)
24. Plague
25. Poliomyelitis
26. Rabies (or exposure to rabies)
27. Rubella and congenital Rubella syndrome
28. Salmonellosis
29. Severe Acute Respiratory Syndrome (SARS)
30. Shigellosis
31. Smallpox
32. Syphilis
33. Tetanus
34. Tuberculosis
35. Typhoid and paratyphoid fevers
36. West Nile Virus
37. Yellow fever
38. Epidemic forms of other diseases
39. Unusual clinical manifestations of disease

SCHEDULE A – Item II

Reportable to Chief Medical Health Officer in writing **within 7 days**.

1. Acquired Immunodeficiency Syndrome (AIDS) and any Human Immunodeficiency Virus (HIV) Infection.
2. Brucellosis
3. Chancroid
4. Chicken Pox (Varicella)
5. Chlamydial Infections
6. Congenital Cytomegalovirus infection
7. Congenital or Neonatal Herpes simplex infection
8. Creutzfeldt-Jacob Disease
9. Cryptosposidiosis
10. Cyclospora
11. Giardiasis (symptomatic cases only)
12. Gonococcal infections
13. Hemolytic Uremic Syndrome
14. Human T-cell lymphotrophic Virus infection (HTLV-1 or 2)
15. Leprosy
16. Listeriosis
17. Lyme Disease
18. Methicillin-resistant *Staphylococcus aureus* infection (MRSA)
19. Mumps
20. Psittacosis / Ornithosis
21. Q-fever
22. Respiratory Syncytial Virus (RSV)
23. Tapeworm infestations (including Echinococcal disease)
24. Trichinosis
25. Toxoplasmosis (symptomatic only)
26. Tularemia
27. Vancomycin-Resistant Enterococci (VRE)

Contact Info:

Communicable Disease Control Office
Health Protection Unit
Department of Health
Box 1000, Station 1000
Iqaluit, Nunavut X0A 0H0
Phone (867) 975-5772
Fax: (867) 979-3190

2.2 Communicable Disease Surveillance and Follow-up

Below is a general protocol for the follow-up of communicable diseases. The specific protocols for each disease are included in the Communicable Disease and Surveillance Manual. Each level of the public health system has a role to play: community, regional and territorial level.

Roles and Responsibilities

1. Community Level

This follow up is done by the Community Health Nurse, Public Health Nurse, or physicians depending on the community. Regional staff are available for consultation and guidance. The CMOH or Deputy CMOH is consulted as appropriate. See Figure 1 for Public Health management of communicable disease cases.

a) Report of a communicable disease is received by the CMOH delegate (Regional Communicable Disease Coordinator, Territorial Communicable Disease Coordinator, Deputy CMOH, or CMOH directly). Sources may include:
    - Health Care providers such as physicians, nurse practitioners, community health nurses and public health nurses
    - Laboratories both within and outside of the Territory
    - Public health authorities in other provinces and territories or at the federal level
b) Review report to determine if it is a reportable disease and follow-up is required.
c) Review case (chart review and interview if necessary) to determine:
    a. If treatment was appropriate and the case was compliant.
    b. If the case was educated about the disease and prevention measures.
    c. Exclude the case from work or school if appropriate.
d) Identify contacts (contact tracing depending on the disease) to:
    a. Assess if exposure actually occurred.
    b. Determine if the contact is susceptible to the communicable disease.
    c. Determine if the contact is symptomatic.
    d. Refer for clinical assessment as needed.
    e. Educate about the disease, e.g. signs and symptoms and how it is transmitted.
    f. Provide appropriate intervention depending on the disease, e.g. quarantine, provide antibiotic prophylaxis, immunize, etc.
e) Once follow-up is complete the public health case report form is completed and sent to the regional level.

2. Regional Level

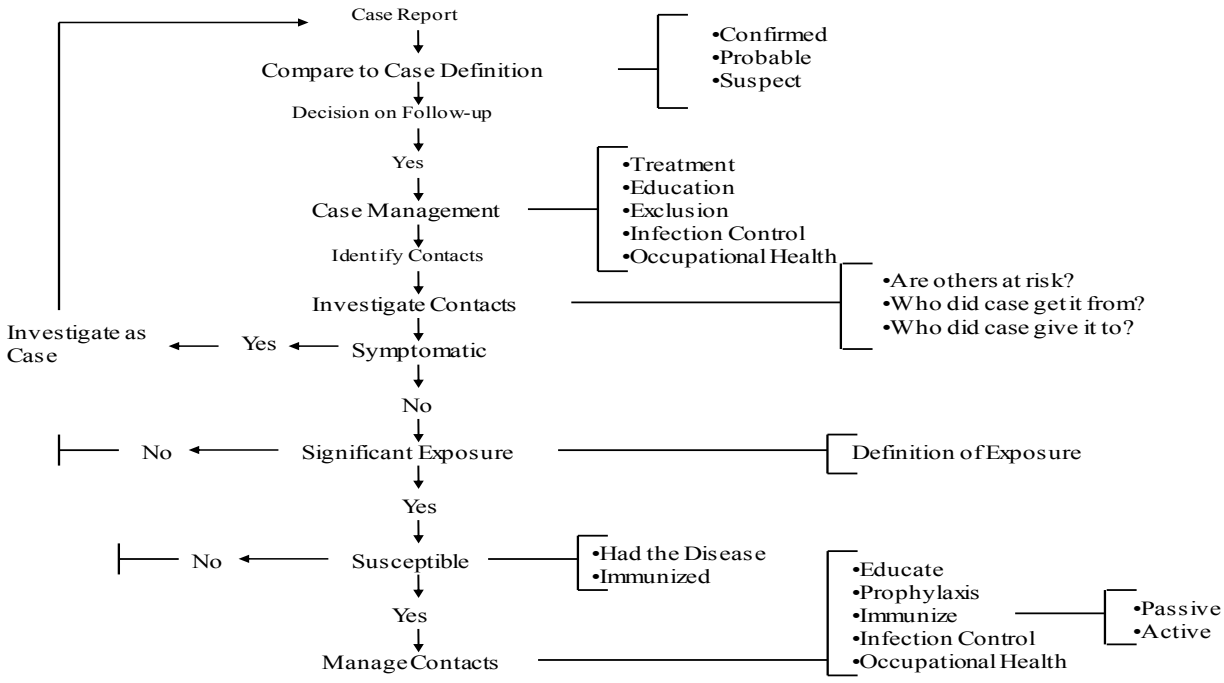
Regional follow-up is done by either the Regional Communicable Disease Coordinator or the Environmental Health Officer depending on the disease (see specific disease protocol).

a) Regional staff review the case report form to ensure public health follow-up is complete and the case is closed.
b) Reports are forwarded to the territorial level as appropriate for the specific disease.

3. Territorial Level

Only the information required for monitoring and surveillance is forwarded to the territorial level where it is used to monitor trends and produce reports. See the Reporting section below.

Figure 1: Public Health Management of Communicable Disease Case



Surveillance and Reporting

Communicable Disease

All reports of communicable diseases are assessed against the surveillance case definition before being included in the case counts for Nunavut. Note that surveillance case definitions are designed for public health case management and surveillance purposes, not for clinical purposes. Surveillance case definitions include clinical, laboratory and epidemiological components. The final decision on whether or not a case meets the case definition rests with the CMOH or designate.

Communicable disease information is entered into a communicable disease information system that is used to produce reports.

The Health Protection Unit is responsible for the preparation of regular reports on communicable diseases in the Territory and the dissemination of these reports to community health centers, to regional health authorities and to senior officials at the Department of Health. Since routine reports are public reports, care is taken to report cases in such a way that individuals are not identified. Most reports provide information rolled up to the regional level.

In addition, reports on diseases that are nationally notifiable are sent to PHAC. This information is included in national reports by province and territory. Reports on diseases that are notifiable to ICS are submitted to ICS and included in their reports.

Outbreak Reports

Physicians and Nurses are required to report to the CMOH if they observe that a communicable disease or an undiagnosed syndrome (such as diarrheal illness) is occurring in unusual numbers. The CMOH or delegate is responsible for following up on the report and determining if an outbreak exists which should be investigated.

Disclosure of Information through Public Health Advisories

As noted above, summary reports on communicable diseases will be produced as public documents on a regular basis. However, during outbreaks or unusual situations it may also be necessary to inform the public of a specific situation including the steps required to protect the public. There are no hard and fast rules for the release of information in this situation. Decisions on the release of information at the community level are made on a case by case basis taking a number of key factors into consideration, including:

- Situation or disease characteristics such as infectiousness and mode of transmission.
- Interventions or prevention measures required to interrupt disease transmission.
- Confidentiality and privacy. Note: to prevent identification of an individual, the number of cases at the community level must be greater than 5 in order to report.
- Minimizing any chance of stigmatizing the community.

Examples of situations where information is released through public health advisories include:

- The presence of rabid animals in a community, e.g. positive foxes or dogs.
- An outbreak of a foodborne illness.
- An outbreak of a respiratory illness like influenza where it is important to remind the public about hand hygiene, cough etiquette and the availability of influenza immunization.
- The presence of *Trichinella* in country food.

3.0 Outbreak Management Guidelines

This section of the Nunavut Communicable Disease and Surveillance Manual provides guidelines for investigating and managing communicable disease outbreaks in the territory. Specific procedures for cases and special-risk groups are included in the individual disease sections of the manual. Also, key components for final outbreak reporting have been included.

3.1 Principals of Outbreak Management

A community outbreak is defined as two or more cases with similar illness that can be epidemiologically-linked (associated by time, place and/or exposure). Note that a single case of certain illnesses can be considered an outbreak, e.g. *E. coli*, Measles.

The Chief Medical Officer of Health (CMOH) or Deputy Chief Medical Officer of Health (DCMOH) will lead an investigation of an outbreak.

- Immediately investigate all reports of suspected outbreaks
- Develop management plan upon outbreak confirmation
- Implement interventions and educational strategies during and following an outbreak
- Inform appropriate Department of Health (DH) staff and other stakeholders (e.g. laboratory, Wildlife Officer) of outbreak status
- Complete an outbreak report and debriefing(s)

3.2 Outbreak Team

The Outbreak Team works in conjunction with appropriate internal and external partners to investigate and manage an outbreak. Membership depends on the potential outbreak source.

Core members	Supplemental members
• CMOH / DCMOH • Territorial Communicable Disease Consultant • Territorial Environmental Health Consultant • Epidemiologist in Office of CMOH • Regional Communicable Disease Coordinator (RCDC) • Regional Environmental Health Officer • Laboratory Representative • Local Primary Care Providers • Communications Staff • Administrative Staff	• Experts from other departments and/or agencies, e.g. Nunavut Department of Environment • Subject matter experts, e.g. infectious disease, infection control, information technology • Contact person from the affected institution (if applicable)

3.3 Roles and Responsibilities of the Outbreak Team Members

Team Member	Roles and Responsibilities
CMOH / DCMOH	• Determine if an outbreak is present • Activate the Outbreak Team • Lead team to ensure appropriate outbreak investigation and management • Inform the appropriate agencies • Oversee public health control measures and interventions • Communicate outbreak information • Ensure debriefings • Ensure final outbreak report is complete • Review final report, evaluations, and lessons learned • Sign off on outbreak reports • Ensure lessons learned and actions are followed up upon as necessary • Ensure distribution of final report
Territorial Communicable Disease Consultant	• Work closely with the CMOH/DCMOH, provide recommendations as required • Liaise with regions • Assist in management and dissemination of information
Territorial Environmental Health Consultant	• Work closely with the CMOH/DCMOH, provide recommendations as required • Liaise with regions • Assist in management and dissemination of information
Epidemiologist in Office of CMOH	• Assist with data collection, e.g. development of an information management tool • Data management, analysis, and interpretation • Create outbreak reports (initial, interim and final reports) • Recommend interventions based on analysis • Review reports and recommendations with team • Receive, compile, and review evaluations
Regional Communicable Disease Coordinator	• Liaise with communities and territorial staff • Implement the outbreak investigation plan • Collect outbreak-related information • Conduct inspections as necessary • Provide education and information needed
Regional Environmental Health Officer	• Liaise with communities and territorial staff • Implement the outbreak investigation plan • Collect outbreak-related information including samples/advice on sampling • Conduct inspections as necessary • Manage testing of samples, e.g. food • Provide education and information needed

Laboratory Representative	• Complete laboratory testing in consultation with healthcare team • Immediately notify by telephone (with follow-up in writing) all positive outbreak-related results • Report negative results related to the outbreak • Decide specimen management (e.g. retention) in consultation with the Outbreak Team, the Public Health and regional laboratories • Work with investigators to link cases to the outbreak • Liaise with other laboratories involved with testing, e.g. Canadian Food Inspection Agency • Provide testing recommendations
DH Regional Staff, e.g. Program Director, Population Health Director	• Support Outbreak Team as needed • Assist in developing provincial education materials and guidelines for public health measures • Liaise with other applicable regional agencies
Primary Health Care Provider, e.g. Community health nurse (CHN) or Nurse practitioner (NP)	• Liaise with regional staff • Collect specimens as directed • Educate and inform patients as directed
Communications	• Support communication for outbreak initiatives including media and news releases, issue management, print materials, and others as required
Administrative Staff	• Organize meetings as required • Record meeting minutes • Store records in a secure location • Disseminate information as instructed
Supplemental Members	• May have significant roles depending on the type of outbreak and at the request of the CMOH

3.4 Steps in Outbreak Investigation and Management

The following steps are not necessarily in order of priority and may be done simultaneously, depending on the outbreak situation.

Confirm the diagnosis	Upon receipt of report, confirm the diagnosis and existence of an outbreak.
Establish an Outbreak Team	See section 4.
Establish a case definition	This may include disease-specific clinical symptoms and/or laboratory criteria.
Develop an interview tool	Develop or modify an interview tool (questionnaire) and other forms as required. Review with the investigators.

Collect information/data	The Outbreak Team Leader determines which team members will investigate and collect all available current information, determining if any additional data is necessary. Information collected will focus on: **Person** • Personal characteristics (date of birth, sex, immune status, marital status, medical conditions, occupation, cultural norms, activities, predisposing or protecting factors) • Symptom inquiry: type of symptoms • Classification as case or contact when appropriate **Place** • Common social event, e.g. wedding, reception, party, sports • Common places visited, e.g. school, or other travel • Possible exposures, e.g. menus, common food item, pool • Contact with animals, pets, vectors, as appropriate **Time** • Period the cases became ill • Onset of symptoms • Duration of symptoms • Time between exposure to potential source (if known) and onset of symptoms If a common social event is identified, and the source is thought to be foodborne, determine what food was served, obtain a guest list and menu, and identify where the food was purchased. Identify common food ingested and any other food that was served that might not be on the menu. Information sources may include: • Interviews with cases, contacts, healthcare staff and agencies involved, e.g. school, restaurant • Environmental public health inspection (facility/site) reports • Literature review • Consultation with experts • Laboratory reports • Review of agency records, e.g. reservation lists
Analyze information	• Review the case definition • Determine attack rates and epidemic curve • Formulate a tentative hypothesis regarding source and transmission • Update data collection tools as required
Develop notifications/alerts	These notifications are for confidential information sharing. For initial outbreak reports, updates (including related shared documents and correspondence) and final outbreak reports, consider notifying the following: • Appropriate regional Public Health staff and partners, e.g. laboratories • Within the region, consider notifying others, e.g. DH Executive Director and Population Health Director

Develop a communication plan/education	Work closely with appropriate communications advisor to: • Consider target groups (public, people at risk, health-care providers, media) • Consider key messages and methods to disseminate (fact sheets, web postings, press releases, letters, etc.) • Assign an Outbreak Team member as media spokesperson • Consider whether a toll-free telephone information line is necessary
Implement control measures based on findings	Determine interventions and treatment such as the following: • Contact tracing if required • Preventative measures, e.g. immunization, exclusion, prophylaxis, treatment of case • Removal of agents/exposure • Addressing the source of the outbreak (see specific disease protocol for control measures) • Closure of premises if required • Modification of procedures, e.g. swimming pool filtration • Cleaning or disinfection of contaminated equipment or fittings (e.g. medical devices, food preparation equipment, etc.)
Ongoing outbreak documentation	It is required that all outbreak-related activities are documented and the records stored in a secure location. For example, log the following: • Minutes of team meetings and conference calls • Notifications, alerts, and correspondence • Pertinent dates, e.g. date outbreak declared and date outbreak declared over
Ongoing evaluation of information and control measures	Consider the criteria for a public health emergency under the International Health Regulations.
Consider further studies or special investigations	Further studies or special investigations may be warranted to gain insight into the source, transmission, or more-effective control measures.
Declare outbreak over	Decided by the Outbreak Team and communicated appropriately.
Evaluate the outbreak control and management	The Outbreak Team will review the investigation and management of the outbreak (debriefing sessions, lessons learned) Recommendations and policy/program modifications will be made as required.
Complete final outbreak report	• The final report should be complete within 30 days of declaring the outbreak over • More complex outbreaks will require a comprehensive final outbreak report as outlined in Appendix A • The CMOH reserves the right to request a further detailed report, review and debriefing of outbreaks at any time

References

1. Control of Communicable Diseases Manual, 19th edition. David L. Heymann, ed. Washington, DC: American Public Health Association, 2008.
2. Outbreak Summary Reporting Application User Manual v.1. Public Health Agency of Canada, 2008.
3. Procedures to Investigate Foodborne Illness, 5th edition. Des Moines, IA: International Association for Food Protection, 2007.
4. Skills Enhancement for Public Health. Public Health Agency of Canada, 2006

APPENDIX A: Comprehensive Final Outbreak Report

Outline

I. Executive Summary
II. Introduction and Background
III. Methods
    a. Epidemiological
    b. Laboratory
    c. Environmental Public Health
IV. Results
    a. Epidemiological
    b. Laboratory
    c. Environmental Public Health
V. Discussion
VI. Conclusions
VII. Evaluation/Recommendations
VIII. Acknowledgements
IX. Signature Block
X. Appendices

Explanation

I. Executive Summary

Include the key features of the outbreak, addressing the "who, what, where, and when" of the outbreak. A description of the outbreak or the causal hypothesis based on the evidence should be included. Identify lessons learned, recommendations, interventions (could be ongoing), or areas that need further attention. Include important points in the report and be prepared to answer any questions with detail.

II. Introduction and Background

Describe the specific events that led to the investigation, including how the outbreak was first reported, steps taken to confirm the outbreak (including surveillance trends), and who assisted in the investigation. Identify the members of the outbreak team and objectives of the investigation. Background information identifies the population demographics, previous, similar outbreaks, describing the area, site or facility involved.

III. Methods

Outline the steps taken to investigate the outbreak.

a. *Epidemiological methods*: Explain how cases are defined and ascertained. Outline the analytical study methodology and include interview tools and techniques used for investigation.
b. *Environmental health methods*: Outline the number and types of environmental health investigations that occurred and who conducted these investigations. This would include site visits, risk assessment, and trace back.
c. *Laboratory analysis:* Describe the number and types of specimens submitted for analysis.

IV. Results

Describe what was discovered.

a. *Epidemiological results*: Highlight the number of cases, personal details, and clinical features, including geographical distribution, epidemic curve, risk factor analysis, and attack rates.

b. *Environmental health results*: Describe the results of inspections, risk assessments, and trace back.

c. *Laboratory results*: Summarize the results of human and food or source testing.

V. Discussion

This section brings together all aspects of the outbreak. Discussion will include the main hypotheses and justification of conclusions and actions being based on evidence or balance of probabilities. Actions taken to protect public health are described. As well, highlight the problems encountered during the investigation including the lessons learned during the outbreak, including those identified in the debriefing(s).

VI. Conclusion

Give a brief summary of the outbreak.

VII. Evaluation/Recommendations

Describe what should be done to control the outbreak, prevent future outbreaks, and improve management of outbreaks in the future. The purpose of this section is to educate, so specificity is important. Recommendations for any changes to the Outbreak Response Plan should be included.

VIII. Acknowledgements

This is an opportunity to thank those who assisted with the outbreak.

IX. Appendices

These may include a chronology of events, Outbreak Team membership, terms of reference for the team, maps and references, questionnaires, letters to health-care professionals, media releases, and fact sheets.

X. Signature Block

This report requires sign-off by the CMOH or DCMOH.

4.0 Enteric, Food and Waterborne Infections

Purpose

The purpose of this section of the Communicable Disease Manual is to provide guidelines for the investigation and management of individuals who have been diagnosed with notifiable infections spread by enteric, food and waterborne routes, including Amoebiasis, Botulism, Campylobacteriosis, Cholera, Cryptosporidiosis, Cyclosporiasis, Giardiasis, Hepatitis A, Listeriosis, Norovirus, Paralytic Shellfish Poisoning, Paratyphoid, Salmonellosis, Shigellosis, Trichinosis, Typhoid, Verotoxigenic *E. coli*, and Yersiniosis.

Legislation/Policy

Authority for the reporting of notifiable infections spread by enteric, food and waterborne routes and their public health management comes from the *Public Health Act, Communicable Disease Regulations*.

All clients who have been diagnosed with a notifiable infection spread by enteric, food and waterborne routes must be reported to the Chief Medical Officer of Health (CMOH).

All clients who are suspected to have or have a confirmed notifiable infection spread by enteric, food and waterborne routes are to be followed as per the protocols in this section.

Roles and Responsibilities

Table 4.1: Roles and responsibilities for follow up of notifiable infections spread by enteric, food and waterborne routes

Role	Responsibilities
Laboratory	• Report all laboratory confirmed notifiable infections spread by enteric, food and waterborne routes to the CMOH or designate.
Health Care Provider team (Physician, Nurse Practitioner, Community Health Nurse)	• Test all clients suspected to have a notifiable infection spread by enteric, food and waterborne routes. • Treat all clients with a notifiable infection spread by enteric, food and waterborne routes if appropriate. • Complete public health case and contact management (as applicable) of clients with a notifiable infection spread by enteric, food and waterborne routes. • Complete the appropriate case report form(s) and send it to the Regional Environmental Health Officer (EHO).
Regional Environmental Health Officer	• Provide advice on a regional basis for the case and contact management (as applicable) of notifiable infections spread by enteric, food and waterborne routes. • Receive and review reports of notifiable diseases spread by enteric, food and waterborne routes, including food and water histories if applicable. • Consult with the Territorial Environmental Health Specialist as required.

Territorial Environmental Health Specialist	• Provide advice on a territorial basis for the case and contact management (as applicable) of notifiable infections spread by enteric, food and waterborne routes. • Ensure cases are included in the communicable disease information system.
Chief or Deputy Chief Medical Officer of Health	• Be available for consultation on notifiable infections spread by enteric, food and waterborne routes. • Make program recommendations.

Reporting: To report infections in this section of the Communicable Disease Manual, use the

Food and Waterborne Illness Investigation Form

4.1.1 Amoebiasis

Special Precautions/Considerations

Precautions: Contact

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Amoebiasis is an enteric infection caused by a protozoan parasitic organism *Entamoeba histolytica*.
Clinical	
Clinical Presentation	Many cases are asymptomatic. Symptoms, when present, are diverse; more severe cases may experience acute amebic dysentery, including one to three weeks of increasing diarrhea containing blood and mucous, lower abdominal pain, tenesmus, possible weight loss and fever.
Diagnostics	The diagnosis of amoebiasis is made by microscopic demonstration of trophozoites or cysts in fresh or preserved fecal specimens, smears of aspirates or scrapings obtained by proctoscopy, aspirates of abscesses or sections of tissue. Serological testing for antibodies may be used in diagnosis for extra-intestinal amoebiasis, such as liver abscess, where stool examination is often negative; however, this is not consistently reliable. Ultrasound or CT scans can identify liver abscesses and other extra-intestinal sites of infection. Follow your regional laboratory procedures for testing.
Treatment	Symptomatic cases should be treated. Consult with the physician for treatment recommendations.
Pathogen	
Occurrence	**Worldwide**: Occurs worldwide but is more prevalent in areas with poor sanitation. Amoebiasis is the third leading parasitic cause of death in developing countries and is a common cause of diarrhea in travellers and recent immigrants. Higher rates of cyst passage have been observed in areas with poor sanitation, in institutions, and among men who have sex with men (MSM). In areas with good sanitation infections tend to cluster in households. **Canada**: The number of reported cases per year in Canada (1987 to 1999) ranged from a high of 2334 (rate 8.55/100,000) in 1989 to a low of 1379 (rate 4.52/100,000) in 1999. Young adults are most often affected (20 to 39 years). **Nunavut**: There have been no reported cases since 2000.
Reservoir	Humans; usually a chronically ill or asymptomatic cyst passer.
Transmission	Mainly through ingestion of fecally contaminated food or water containing amoebic cysts, which are relatively chlorine resistant. Transmission may occur sexually by fecal-oral contact.
Incubation Period	From a few days to several months or years; commonly two to four weeks.
Communicability	Communicable as long as *E. histolytica* cysts are passed; this may be years if left untreated.
Susceptibility and Resistance	Universal susceptibility. Those individuals with immunodeficiencies (including AIDS) may suffer more severe forms of the disease. Susceptibility to re-infection is rare.

Public Health Management

Case

Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian.

Investigate cases to determine the source of infection, being sure to obtain the following disease-specific information:

- Food and water history (retain all suspected food or water for laboratory analysis based on Environmental Health Officer [EHO] direction).
- History of recent (international) travel.
- Sexual history.

Cases should be instructed about disease transmission and prevention.

Exclusion is at the discretion of the Chief Medical Officer of Health (CMOH) / Deputy CMOH. Consult with the EHO regarding exclusion criteria described below:

Risk Group	Criteria for Exclusion
Food Handlers	Exclude until asymptomatic and stool is formed.
Health care, nursery or other staff who have contact with susceptible persons	Exclude until asymptomatic and stool is formed.
Children less than 5 years old attending daycare	Exclude until asymptomatic and stool is formed.
Case contacts who are in special risk groups	Contacts that develop gastrointestinal symptoms should be tested for *E. histolytica*.

Contacts

Household members and other suspected contacts should be assessed for symptoms. Consider testing symptomatic household members and refer to attending health care provider for treatment. Contacts should be instructed about disease transmission and prevention.

Outbreaks

If a higher than normal amount of disease activity is detected, contact your EHO.

Health Education

- Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after toileting, diapering, sexual contact, and before preparing or eating food.
- Educate food handlers about proper food and equipment handling and hygiene.
- Provide health education on consumption of safe water e.g., avoid drinking or swallowing contaminated water from lakes, rivers, or streams.
- Infected individuals should avoid using public swimming pool when feces cannot be contained or when experiencing diarrhea; contaminated recreational water can be a vehicle for the human to human transmission of enteric pathogens.
- Educate about the risk of sexual practices that permit fecal-oral contact.
- Travelers to areas of higher prevalence should be advised of methods to make water safe for drinking, including boiling, chemical disinfection and filtration.

Health Settings Management	
Infection Control Measures in Health Care Settings	Contact precautions if feces or pus cannot be contained.
Occupational Health	
Surveillance	
Case Definition	**Confirmed case:** Laboratory confirmation of infection with or without clinical illness: • Microscopic demonstration of trophozoites or cysts in fecal specimens, smears of aspirates or scrapings obtained by proctoscopy, or aspirates of abscess or sections of tissue **OR** • Positive stool antigen detection test **OR** • Positive serology. **Clinical illness:** Clinical illness varies from mild abdominal discomfort with diarrhea (+/- blood, mucus) alternating with periods of constipation and/or remission to amoebic dysentery (fever, chills, bloody/mucoid diarrhea). Rarely, disseminated disease may occur causing liver (most common), lung or brain abscess.
Reporting Requirements and Forms	**Amoebiasis is a notifiable infection in Nunavut**; however, surveillance is laboratory-based only. Submission of case report forms (routine or enhanced) is **not required**, unless specifically requested by the CMOH/DCMOH or designate. Report outbreaks to the EHO immediately, who will report these to the Office of the CMOH.
Tools	
Guidelines	
Materials & Resources	
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Amoebiasis-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at: http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on March 17, 2014.

4.2.1 Botulism

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Botulism is caused by toxins produced by *Clostridium botulinum*, a spore-forming obligate anaerobic bacillus. Most human botulism is caused by toxin types A, B, E, F and G.
Clinical	
Clinical Presentation	**Foodborne and wound botulism** present as a disease of the nervous system characterized by blurred or double vision, dysphagia, dysphonia, dry mouth and dysarthria. Descending symmetrical flaccid paralysis may follow. Vomiting, constipation and diarrhea may also be present. Fever is usually absent. **Intestinal (infant and adult) botulism** may present initially in infants as gastrointestinal upset with constipation, listlessness, weak cry, poor feeding, diminished gag reflex, loss of head control and generalized weakness ("floppy infant"). These symptoms may lead to respiratory difficulties and arrest. The illness may be mild or severe and may be associated with Sudden Infant Death Syndrome (SIDS).
Diagnostics	Botulism diagnosis is based primarily on clinical presentation and should be suspected in a person with acute onset of gastrointestinal, autonomic (such as dry mouth or difficulty focusing eyes), and cranial-nerve dysfunction (diplopia, dysarthria, dysphagia). The diagnosis is even more likely if the patient has recently eaten aged country foods, home-canned foods or if family members/companions who have shared the same meals are similarly ill. Testing of samples for suspect cases of botulism will be coordinated through the Chief Medical Officer of Health (CMOH)/Deputy CMOH or designate. Most specimens collected (food and clinical) are sent to the Botulism Reference Laboratory in Ottawa, Ontario. Laboratory evaluation includes anaerobic cultures and toxin assays of serum, stool, and the implicated food if available. Cases caught early are more likely to be diagnosed by the toxin assay, whereas those studied later in the disease are more likely to have a positive culture than a positive toxin assay. Toxin excretion may continue up to one month after the onset of illness, and stool cultures may remain positive for a similar period.
Treatment	Individuals with botulism require immediate emergency medical treatment; such treatment must not await medical confirmation. **Foodborne and wound botulism**: Immediate respiratory assessment and management is essential. Consult with Physician immediately. Botulism antitoxin is usually available at each Community Health Centre and Regional Pharmacy. **Intestinal (infant) botulism**: Consult with physician immediately.
Pathogen	
Occurrence	**Worldwide**: Sporadic cases, family and general outbreaks occur when food is prepared or preserved by methods that do not destroy spores and permit toxin formation. Cases rarely result from contaminated commercially processed

	products; however, outbreaks have occurred from contamination through cans damaged after processing. **Canada**: Since first being reported in 1933, foodborne botulism remains a rare disease that primarily affects the First Nations and Inuit people. A published review of outbreaks from 1919 to 1973 documents that two-thirds of the 62 outbreaks reported involved Inuit and West Coast Aboriginal people. Type E toxin is most commonly seen in foodborne cases in Canada. Infant botulism is rare in Canada with only seven cases reported since 1979. The source is rarely identified. **Nunavut**: There were two confirmed cases of foodborne Botulism in Nunavut between 2006 and 2015.
Reservoir	*Botulinum* spores are ubiquitous in soil worldwide. They are frequently recovered from agricultural products, including honey, and are also found in marine sediments in the intestinal tract of animals, including fish.
Transmission	**Foodborne botulism** is transmitted by the ingestion of improperly prepared, stored or cooked food containing the toxin. The foods most often implicated are canned foods (vegetables and fruits), home preserved foods, smoked fish, seal meat and other arctic marine mammals such as whale meat. **Wound botulism** occurs when *C. botulinum* contaminates a wound and is accompanied by anaerobic conditions that allow for *in-vivo* toxin production in the wound. Historically, the primary cause of wound botulism was due to soil contamination from a penetrating trauma or crush injury. But in the past decade, parenteral drug abuse related cases have surpassed those related to trauma. Most cases of wound botulism are associated with the intramuscular or subcutaneous injection of (contaminated) black tar heroin as well as sinusitis in those who snort cocaine. **Intestinal (infant) botulism** is typically associated with the ingestion of spores that germinate and produce toxin in-vivo that may be present in items such as foods, soil, dust, unpasteurized honey and peanut butter.
Incubation Period	**Foodborne**: Neurological symptoms usually appear within 12 to 36 hours after ingestion of contaminated food (range is 6 hours to 8 days). The shorter the incubation period, the more severe the disease and the higher the case-fatality rate. **Wound**: Usually 4 to 14 days from the time of injury to onset of symptoms. **Intestinal (infant)**: Unknown, as the precise time of ingestion often cannot be determined.
Communicability	No direct person to person transmission has been documented.
Susceptibility and Resistance	Susceptibility is general. Adults with special bowel problems leading to unusual gastrointestinal flora (or with a flora unintentionally altered by antibiotic treatment for other purposes) may be susceptible to intestinal botulism. Injection drug users (IDUs) who intentionally or accidentally inject subcutaneously or intramuscularly have been vulnerable to infection. Immunity to botulism toxin does not develop even following severe disease.

Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the ***Food and Waterborne Illness Investigation Form*** dated March 2014 or later. Treatment of clinical cases should not be delayed until laboratory confirmation. Treatment is under the direction of the attending health care provider in consultation with an infectious disease specialist. **Foodborne Botulism** • Inform the Environmental Health Officer • Take a detailed food history of those who are ill, especially foods consumed within the last two or three days. Include consumption of home-preserved foods and traditionally prepared foods. Even theoretically unlikely foods should be considered. *C. botulinum* may or may not cause container lids to bulge and the contents to have "off-odours." Other contaminants can also cause cans or bottle lids to bulge. • Collect food samples and forward to the laboratory for toxin analysis. • Collect clinical samples (sera, gastric aspirates and stool) from patients and, when indicated, **before** administration of antitoxin. • Identify individuals who may have been exposed to the same source. **Infant Botulism** • Investigate source, in particular, history of honey consumption. • Identify individuals who may have been exposed to the same source. **Wound Botulism** • Determine if history of trauma, or IDU and if possible forward sample of drug for testing. • Identify individuals who may have been exposed to the same source.
Contacts	Botulism is not passed person to person, therefore, direct contacts of the index case do not require follow-up. People who are known to have eaten contaminated food or who have shared a likely exposure should be advised to consult with a healthcare provider for assessment and/or treatment. Treatment may include purging with cathartics, gastric lavage and high enemas, and close medical observation.
Outbreaks	A single case of botulism should be considered an outbreak and be managed with great urgency, in collaboration with the CMOH/DCMOH. Contact your Environmental Health Officer (EHO) immediately if even a single case of botulism is suspected.
Health Education	Educate the public about the safe handling of food. For example: • Keep aging meats such as whale, seal or walrus in a cool place (below 4°C), in containers that allow air in and, if aged in oil, keep in a cool place and stir frequently to allow the meat to be in contact with air. • Do not use food from damaged or bulging containers. These containers should be returned unopened to the vendor. • Foods with off-odours and unusual tastes should not be eaten or 'taste-tested'. • Proper storage is one of the keys to food safety. Refrigeration slows down most bacterial growth. Encourage people to check the temperature of their

	fridge on a regular basis with a refrigerator thermometer. Set the refrigerator at or below 4°C (40°F). Don't overload the fridge - cool air must circulate freely to keep food properly chilled. After grocery shopping, immediately refrigerate or freeze foods as indicated on the label. Storing food in non-airtight containers and at 4°C or lower will prevent growth of the bacterium. • Boil (for at least 10 minutes) and stir home-canned foods to destroy botulinum toxins. • Take precautions with home-prepared foods stored in oil (e.g., vegetables, herbs and spices). If these products are prepared using fresh ingredients, they must be kept refrigerated (below 4ºC) and for no more than 10 days. • Avoid feeding honey to infants (even if pasteurized). Where wound botulism occurs in IDUs, educate them regarding safe injection practices: • Do NOT inject into muscle or under the skin. • Decrease the amount of citric acid used to dissolve the drug. Too much citric acid damages the tissues under the skin leaving them susceptible to bacterial growth. • Studies have shown that when cocaine is mixed with heroin and when injected at the same site it gives bacteria a better chance to grow so, inject different drugs at different sites on the body. • Teach IDUs signs and symptoms of infection(s) and to seek physician help especially if infection seems different than ones they have had in the past.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine
Occupational Health	
Surveillance	
Case Definition	**<u>Confirmed case</u>:** A confirmed case requires laboratory definitive evidence with clinical evidence **or, in the case of foodborne botulism,** clinical evidence and consumption of the same suspect food as an individual who has laboratory-confirmed botulism. **Foodborne Botulism (Either 1 or 2 below)** 1. Laboratory confirmation of intoxication with clinical evidence (see below): detection of botulinum toxin in serum, stool, gastric aspirate or food OR isolation of *Clostridium botulinum* from stool or gastric aspirate 2. Clinical evidence and indication that the client ate the same suspect food as an individual with laboratory-confirmed botulism **Wound Botulism** Laboratory confirmation of infection: laboratory detection of botulinum toxin in serum OR isolation of *C. botulinum* from a wound

	AND presence of a freshly infected wound in the 2 weeks before symptoms and no evidence of consumption of food contaminated with *C. botulinum* **Infant Botulism** Laboratory confirmation with symptoms compatible with botulism in a person less than one year of age (see below): • Detection of botulinum toxin in stool or serum **OR** • Isolation of *C. botulinum* from the patient's stool, or at autopsy. **Colonization Botulism** Laboratory confirmation with symptoms compatible with botulism in a patient aged 1 year or older with severely compromised gastrointestinal tract functioning (i.e., abnormal bowel) due to various diseases such as colitis, intestinal bypass procedures or in association with other conditions that may create local or widespread disruption in the normal intestinal flora. • Detection of botulinum toxin in stool or serum **OR** • Isolation of *C. botulinum* from the patient's stool, or at autopsy. **Probable case:** **Foodborne** Clinical illness (see below) and consumption of a suspect food item in the incubation period (12–48 hours). **Clinical evidence:** **Foodborne:** Clinical illness is characterized by blurred vision, dry mouth and difficulty swallowing and speaking. Descending and symmetric paralysis may progress rapidly, often requiring respiratory support. **Wound:** Clinical illness is characterized by diplopia, blurred vision and bulbar weakness. Symmetric paralysis may progress rapidly. **Infant:** Clinical illness in infants is characterized by constipation, loss of appetite, weakness, altered cry and loss of head control
Reporting Requirements and Forms	**Botulism is a notifiable infection in Nunavut:** 1. Notify your EHO if during regular business hours, or the Public Health Emergency Contact after regular business hours at 867-975-5772. 2. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later. 3. Fax the form, within 24 hours of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: o Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 o All other Qikiqtaaluk communities: 867-473-2657 4. If you cannot contact your EHO, contact the Territorial Environmental Health Consultant at 867-975-5782.

Tools

Guidelines	Botulism – Guide for Healthcare Professionals (2012). Available online at: http://www.hc-sc.gc.ca/fn-an/legislation/guide-ld/botulism-botulisme-prof-eng.php
Materials & Resources	
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Botulism-2011.pdf

Canadian Immunization Guide, Seventh Edition (2006). Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/p05-01-eng.php#gg

Public Health Agency of Canada, 2006. Canadian Immunization Guide, Seventh Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at:

http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 9, 2015.

4.3.1 Campylobacteriosis

Special Precautions/Considerations

Precautions: Contact

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	The bacterium *Campylobacter jejuni* and less commonly *Campylobacter coli* are the usual causes of campylobacteriosis. Campylobacter species are motile Gram-negative bacilli that cause gastroenteritis.
Clinical	
Clinical Presentation	Severity of symptoms may vary. Illness is characterized by diarrhea, abdominal pain, malaise, fever and nausea and vomiting. The symptoms can vary from mild to severe, can mimic appendicitis and can also be asymptomatic. Relapses can occur. Blood and mucous may be present in liquid stools. Infection is most often self-limited and symptoms cease within 2 to 5 days. Less common presentations include typhoid-like syndrome, febrile convulsions or meningitis; post-infectious complications include reactive arthritis, febrile convulsions or Guillain-Barre syndrome (GBS).
Diagnostics	Diagnosis is made by culture of the organism from stool. Isolation of *C. jejuni* from food is difficult as the bacteria are usually present in low numbers. Follow your regional laboratory procedures for testing.
Treatment	Treatment recommendations are under the direction of the attending healthcare provider. Specific treatment is generally not indicated except for supportive treatment, including rehydration and electrolyte replacement. However, treatment with certain antibiotics may shorten duration of illness and prevent relapse when given early in illness. Consult with the physician appropriate treatment information.
Pathogen	
Occurrence	**Worldwide**: *Campylobacter* species cause approximately 5 to 14% of diarrheal illness worldwide and it is an important cause of traveller's diarrhea. Common source outbreaks occur. **Canada**: Campylobacteriosis occurs year round with a peak in summer and early fall. The highest incidence is in children under the age of five years and young adults. The rate in Canada has remained relatively stable. From 1988 to 2000, the rate ranged from 37.7 to 48.7/100,000. **Nunavut:** There have been an average of 2 cases per year since 2000 (range 0-6 cases per year).
Reservoir	Feces of an infected animal or human. The gastrointestinal tract of animals and birds (especially pets, cattle, chickens, turkey, and water fowl) can be a reservoir.
Transmission	Ingestion of the organisms in undercooked meat and poultry, contaminated food and water, or raw milk and other dairy products; contact with infected pets (especially puppies and kittens), farm animals or infected infants. The infective dose is often low. Person to person transmission appears uncommon.
Incubation Period	Usually 2 to 5 days, with a range of 1 to 10 days depending on the dose ingested.
Communicability	Persons not treated with antibiotics may excrete the organism for as long as two to seven weeks. Communicable for 2 to 3 days after starting treatment with appropriate antibiotics.

<table>
<tr><td>Susceptibility and Resistance</td><td>Immune mechanisms are not well understood, but infection with Campylobacter confers lasting immunity to that strain. In developing countries, most people develop immunity in the first two years of life.</td></tr>
<tr><td colspan="2"><h2>Public Health Management</h2></td></tr>
<tr><td>Case</td><td>Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the Food and Waterborne Illness Report Form dated March 2014 or later.

Investigate cases to determine the source of infection, being sure to obtain the following disease-specific information:
Food and water history (retain all suspected food or water for laboratory analysis based on Environmental Health Officer [EHO] direction).
History of recent (international) travel.
Cases should be instructed about disease transmission and prevention.

Exclusion is at the discretion of the Chief Medical Officer of Health (CMOH)/Deputy CMOH. Consult with the EHO regarding exclusion criteria described below:<table><tr><th>Risk Group</th><th>Criteria for Exclusion</th></tr><tr><td>Food Handlers</td><td>Exclude until asymptomatic and client has two well formed stools.</td></tr><tr><td>Health care, nursery or other staff who have contact with susceptible persons</td><td>Exclude until asymptomatic and client has two well formed stools.</td></tr><tr><td>Children less than 5 years old attending daycare</td><td>Exclude until symptoms have cleared and stools are well formed or child has been on antibiotics for 2 days; whichever is the shorter period of time.</td></tr><tr><td>Case contacts who are in special risk groups</td><td>Symptomatic:

Asymptomatic: Stools do not need to be screened. Exclude only when there is a concern about inadequate hand washing procedures.</td></tr></table></td></tr>
<tr><td>Contacts</td><td>Assess household and other contacts to determine if exposed to the same source.
Contacts should be instructed about disease transmission and prevention.
Symptomatic contacts should be assessed by a healthcare provider.
Contacts that are symptomatic may be excluded from daycare or similar facilities or occupations involving food handling, patient care or care of young, elderly or dependent persons as per CMOH/DCMOH assessment.
Asymptomatic contacts, in general, are not excluded from work or daycare.</td></tr>
<tr><td>Outbreaks</td><td>If a higher than normal amount of disease activity is detected, notify your EHO.</td></tr>
<tr><td>Health Education</td><td>Minimize cross contamination by washing cutting boards and utensils with warm soapy water after contact with raw poultry, and avoiding contact between fruits, vegetables and ready-to-eat foods with the juices of raw poultry.
Wash hands after using sanitary facilities, handling raw poultry, or contact with the feces of dogs and cats, particularly diarrheic stools of puppies and kittens, and before handling foods.</td></tr>
</table>

	• Cook thoroughly all food derived from animal sources, especially poultry. • Consume only pasteurized milk and milk products. • Educate about the risk of sexual practices that permit fecal-oral contact. • Provide food safety education to food handlers about safe food and equipment handling, and personal hand hygiene. • Advise infected individuals to avoid food preparation; enforce the exclusion of cases and symptomatic people from food handling, patient care and child care.
Health Settings Management	
Infection Control Measures in Health Care Settings	Contact precautions.
Occupational Health	Gown and gloves if risk of contact with feces.
Surveillance	
Case Definition	**Confirmed case:** Laboratory confirmation of infection with or without symptoms: • Isolation of *Campylobacter* species from an appropriate clinical specimen. **Probable case:** Clinical illness (see below) in a person who is epidemiologically linked to a confirmed case. **Clinical illness**: Clinical illness is characterized by diarrhea, abdominal pain, malaise, fever, and nausea and/or vomiting.
Reporting Requirements and Forms	**Campylobacteriosis is a notifiable infection in Nunavut:** 1. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later. 2. Fax the form, within 7 days of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: o Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 o All other Qikiqtaaluk communities: 867-473-2657
Tools	
Guidelines	
Materials & Resources	**Fact Sheet: Campylobacteriosis**
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Campylobacteriosis-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at : http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 18, 2015.

4.4.1 Cholera

Special Precautions/Considerations

Precautions: Routine

*Consider Contact precautions for incontinent clients and children under 6

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Two strains of cholera are associated with infection: *Vibrio cholerae* serogroup O1 and *V. cholerae* serogroup O139. These are gram-negative, non-spore forming bacteria.
Clinical	
Clinical Presentation	Most cases are asymptomatic, although the bacterium is present in their feces for 7 to 14 days. When illness does occur, infection causes only mild to moderate diarrhea in approximately 90% of individuals. In 5 to 10% of those infected, individuals develop severe, watery diarrhea and vomiting. Stools are typically colourless with flecks of mucous referred to as “rice water” diarrhea. The resulting loss of fluids in an infected individual can rapidly lead to severe dehydration. If not treated, death can occur within hours.
Diagnostics	Diagnosis is made by culturing *Vibrio cholerae* serogroup O1 or O139 from stool. Follow your regional laboratory procedures for testing.
Treatment	Mild disease does not require the use of antimicrobial therapy. Prompt fluid therapy with volumes of electrolyte solution adequate to correct dehydration, acidosis and hypokalemia is the keystone of treatment. Since serogroups O1 or O139 can be resistant to antimicrobials and the treatment options are extensive, Consultation with an infectious disease physician is suggested.
Pathogen	
Occurrence	**Worldwide**: Cholera outbreaks can occur sporadically in any part of the world where water supplies, sanitation, food safety, and hygiene are inadequate. The greatest risk of cholera occurs in overpopulated communities and refugee settings characterized by poor sanitation and unsafe drinking water. **Canada**: Cholera was first reported in Canada in 1974. It is rarely seen. Since 1989 there has been an average of three cases per year reported in Canada. Four cases were reported in 2002 and five cases were reported in 2003. All reported cases have been related to travel or immigration. No secondary transmission occurred. **Nunavut**: There have been no reported cases of Cholera in Nunavut.
Reservoir	Humans are the only documented natural hosts, but living *V. cholerae* organisms can exist in the aquatic environment.
Transmission	Ingestion of food or water contaminated with feces or vomitus of infected humans and occasionally feces of carriers; consumption of raw or improperly cooked seafood, and other foods harvested from estuarine water or seawater. Direct person-to-person transmission has not been documented.
Incubation Period	Usually 2 to 3 days, ranges from a few hours to 5 days.

Communicability	For the duration of the stool-positive stage, usually until 2 to 3 days after recovery; however, a carrier state may persist for months. Appropriate antibiotics can shorten the period of communicability, but are not recommended for treatment.
Susceptibility and Resistance	Susceptibility is variable; gastric achlorydria (low gastric acid secretion) and the lack of immunity seen in small children may increase the risk of illness, whereas breastfed infants are protected. In endemic areas, most people acquire antibodies by early adulthood. Infection with O1 serogroup affords no protection against O139 infection and vice versa.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Treatment is under the direction of the attending health care provider in consultation with an infectious disease specialist. All cases should be instructed about disease transmission, appropriate personal hygiene, routine practices, and contact precautions. Exclusion of cases is at the discretion of the CMOH/DCMOH.
Contacts	There is no documented person-to-person transmission of cholera, however: • Persons who shared food and drink with a confirmed cholera case should be asked to report any diarrheal symptoms for five days from their last exposure. • Exclusion of contacts is at the discretion of the CMOH/DCMOH if deemed a transmission risk. • If there is a high probability of transmission based on food preparation history and usual hygiene, household members may be considered for chemoprophylaxis.
Outbreaks	Contact your Environmental Health Officer (EHO) if even a single case of cholera is suspected.
Health Education	Educate those travelling to cholera-endemic areas: • Advise travellers to take appropriate precautions to avoid contact with, or ingestion of, potentially contaminated food or water. Most travellers visiting an area where cholera occurs are at very low risk of acquiring infection. • Avoid eating raw oysters and undercooked fish and shellfish. • Consult with a travel clinic regarding cholera occurrence and vaccination recommendations. • Educate the general public and especially food handlers about careful handwashing after toileting, sexual contact and before preparing or eating food.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine. Consider Contact precautions for incontinent clients and children under 6
Occupational Health	Gown and gloves if risk of contact with feces.

Surveillance

Case Definition	**Confirmed case:** Clinical evidence of illness with laboratory confirmation of infection through isolation of cholera toxin producing *Vibrio cholera* serotype O1 or O139 from vomitus or stool. **Probable case:** Clinical evidence of illness in a person who is epidemiologically linked to a confirmed case. **Clinical evidence:** Characterized by acute, watery diarrhea and/or vomiting. The severity of illness may vary.
Reporting Requirements and Forms	**Cholera is a notifiable infection in Nunavut;** however, submission of case report forms (routine or enhanced) is **not required** unless specifically requested by the CMOH/DCMOH or designate. Report any suspected cases to the EHO immediately, who will report these to the Office of the CMOH.

Tools

Guidelines	
Materials & Resources	
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Cholera-O1-O139-2011.pdf

Public Health Agency of Canada, 2006. Canadian Immunization Guide, Seventh Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 9, 2015.

4.5.1 Cryptosporidiosis

Special Precautions/Considerations

Precautions: Routine

*Consider Contact precautions for incontinent clients and children under 6

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	*Cryptosporidium parvum,* an intracellular protozoan parasite.
Clinical	
Clinical Presentation	Asymptomatic infections are common. Symptoms may include watery diarrhea accompanied by abdominal pain, and sometimes fever, malaise, nausea, and vomiting and loss of appetite. In immunocompromised individuals (e.g., persons with HIV infection) chronic severe diarrhea can result in dehydration and possibly death.
Diagnostics	Diagnosis is made through examination of stools, intestinal fluid or small bowel biopsy for oocysts or parasitic antigens. It may require more than one specimen due to intermittent shedding of oocysts during infection. Follow your regional laboratory procedures for testing.
Treatment	In most cases, cryptosporidiosis is a self-limited disease; administer rehydration and electrolyte replacement as indicated. There is no treatment of known value. For chronic cases, consult with the Chief Medical Officer of Health (CMOH)/Deputy CMOH or infectious disease specialist.
Pathogen	
Occurrence	**Worldwide**: *Cryptosporidium* is considered one of the most common enteric pathogens in humans and domestic animals worldwide. Children under six years of age, animal handlers, travellers, Men who have Sex with Men, and close personal contacts of infected individuals (families, healthcare and daycare workers) are most likely to become infected. The incidence is greatest in the summer and early fall (outdoor swimming season). Outbreaks in North America and Europe have been associated with contaminated drinking water, contaminated swimming pools, water parks and lakes, and unpasteurized apple cider. **Canada**: Recent outbreaks and cases in Canada have been associated with swimming in and drinking contaminated pool water. **Nunavut**: There have been a total of 16 reported cases in Nunavut from 2007–2011.
Reservoir	Humans, cattle, and sheep are the principal reservoirs for *Cryptosporidium*. Other domestic animals including birds and reptiles, and occasionally wild animals are also reservoirs for this parasite.
Transmission	Fecal-oral contact between humans and between animals and humans. Ingestion of contaminated food and water. Transmission between sexual partners has been reported.
Incubation Period	Not precisely known. It has been suggested that one to 12 days is the likely range with an average of 7 days.
Communicability	From onset of symptoms until several weeks after symptoms resolve. Outside the body the pathogen remains infective for 2 to 6 months in a moist environment.

<table>
<tr><td>Susceptibility and Resistance</td><td>Universal susceptibility. Persons with intact immune functions usually have asymptomatic or self-limited infections. The illness may be prolonged in severely immunocompromised individuals.</td></tr>
<tr><td colspan="2"><h2>Public Health Management</h2></td></tr>
<tr><td>Case</td><td>Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian.

Investigate cases to determine the source of infection, being sure to obtain the following disease-specific information:
Food and water history (retain all suspected food or water for laboratory analysis based on Environmental Health Officer [EHO] direction).
History of recent (international) travel.
Sexual history.
Cases should be instructed about disease transmission and prevention.

Exclusion is at the discretion of the COMH/DCMOH. Consult with the EHO regarding exclusion criteria described below:<table><tr><th>Risk Group</th><th>Criteria for Exclusion</th></tr><tr><td>Food Handlers</td><td>Exclude until asymptomatic and client has two well formed stools.</td></tr><tr><td>Health care, nursery or other staff who have contact with susceptible persons</td><td>Exclude until asymptomatic and client has two well formed stools.</td></tr><tr><td>Children less than 5 years old attending daycare etc.</td><td>Exclude until asymptomatic and client has two well formed stools.</td></tr><tr><td>Case contacts who are in special symptomatic risk groups</td><td>Symptomatic: Exclude until asymptomatic and client has two well formed stools.
Asymptomatic: No exclusion required</td></tr></table></td></tr>
<tr><td>Contacts</td><td>Contacts include persons living in the same household, children and childcare workers in a child care facility, and individuals exposed to the same source (if identified).
Assess household and other contacts to determine if exposed to the same source.
Contacts should be instructed about disease transmission and prevention.
Symptomatic contacts should be assessed by a healthcare provider.
Contacts that are symptomatic may be excluded from daycare or similar facilities or occupations involving food handling, patient care or care of young, elderly or dependent persons as per CMOH/DCMOH assessment.
Asymptomatic contacts, in general, are not excluded from work or daycare.</td></tr>
<tr><td>Outbreaks</td><td>If a higher than normal amount of disease activity is detected, notify your EHO.</td></tr>
<tr><td>Health Education</td><td>Educate members of the public about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food.
Provide education to food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products, and thorough hand washing.
Encourage hand washing after any animal contact including pets, especially those in contact with animals with diarrhea.
Advise infected individuals to avoid food preparation.</td></tr>
</table>

	• Educate about the risk of sexual practices that permit fecal-oral contact. • Advise infected individuals to not use public recreational water (e.g., pools, lakes, ponds) for two weeks after symptoms resolve.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine. Consider contact precautions for incontinent clients and children under 6.
Occupational Health	Gown and gloves if risk of contact with feces.
Surveillance	
Case Definition	**Confirmed case:** Laboratory confirmation of infection with or without clinical illness (see below) from an appropriate clinical specimen (e.g., stool, intestinal fluid or small bowel biopsy): • Demonstration of *Cryptosporidium* oocysts **OR** • Detection of *Cryptosporidium* nucleic acid (e.g., PCR) in an appropriate clinical specimen **OR** • Detection of *Cryptosporidium* antigen by an approved method (e.g., EIA). **Probable Case:** Clinical illness (see below) in a person who is epidemiologically linked to a confirmed case. **Clinical illness:** Clinical illness is characterized by diarrhea (often profuse and watery) and abdominal cramps with or without loss of appetite, low grade fever, nausea, general malaise and vomiting. The illness may be prolonged in severely immunocompromised persons.
Reporting Requirements and Forms	**Cryptosporidiosis is a notifiable infection in Nunavut:** 1. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later. 2. Fax the form, within 7 days of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: o Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 o All other Qikiqtaaluk communities: 867-473-2657
Tools	
Guidelines	
Materials & Resources	**Fact Sheet: Cryptosporidiosis**
References	
Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Cryptosporidiosis-2011.pdf	

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at :

http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 18, 2015.

4.6.1 Cyclosporiasis

Special Precautions/Considerations

Precautions: Contact

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	*Cyclospora cayetanensis,* a sporulating coccidian parasite that infects the upper small bowel. *Cyclospora* are resistant to chlorination.
Clinical	
Clinical Presentation	Abrupt onset of profuse, watery diarrhea. Nausea, vomiting, anorexia, substantial weight loss, abdominal bloating or cramping and prolonged fatigue can also occur. Diarrhea can alternate with constipation. The infection is typically self-limited, lasting 2 to 7 weeks; however in some untreated cases, persistent diarrheal illness may occur.
Diagnostics	Diagnosis is made by the identification of oocysts in the stool, duodenal/jejunal aspirate, or small bowel biopsy specimen. Follow your regional laboratory procedures for testing.
Treatment	In most cases, Cyclosporiasis is a self-limited disease and treatment is not indicated. Oral trimethoprim-sulfamethoxazole for 7 days may be recommended. Consult with physician for treatment recommendations.
Pathogen	
Occurrence	**Worldwide**: *Cyclospora* infections occur in clusters and sporadically worldwide but are most common in tropical and subtropical areas. Prevalence in North America is thought to be low, however since 1990, at least 11 food-borne outbreaks have occurred in Canada and the United States affecting approximately 3600 persons. **Canada:** Recent outbreaks and cases in Canada have been associated with the consumption of contaminated berries, predominantly imported raspberries. **Nunavut**: No reported cases since 2000.
Reservoir	Confirmed natural infection in animals and humans has not been documented.
Transmission	Primarily through consumption of contaminated water, or swimming in contaminated water. Some outbreaks have been associated with consumption of fresh produce, but the way in which the produce was contaminated has not been identified; *Cyclospora* is not naturally found in or on fresh fruits and vegetables or any other foods. Agricultural water may play a role in contamination. *Cyclospora* is not infectious at the time it is excreted in the stool. Person to person and animal to person transmission have not been documented.
Incubation Period	Approximately 7 days, range of 1 to 14 days.
Communicability	The disappearance of symptoms and oocysts usually occurs simultaneously. The mean duration of organism shedding is 23 days.
Susceptibility and Resistance	Available evidence is limited, however believed to be universal susceptibility. Persons who have been treated for previous *Cyclospora* infection can be re-infected.
Public Health Management	
Case	• Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the

	case, parent or guardian. • Retain all suspected food or water for laboratory analysis based on Environmental Health Officer (EHO) direction. • All cases should be instructed about disease transmission and prevention. • Symptomatic and asymptomatic individuals are generally not excluded from work or daycare.
Contacts	No follow-up is required; Cyclosporiasis is not transmitted person to person.
Outbreaks	If a higher than normal amount of disease activity is detected, contact your EHO.
Health Education	• Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food. • Educate food handlers about proper food handling, preparation, and hygiene. • Encourage thorough washing of fresh produce prior to consumption although this is not always effective. • All travelers should seek out and be provided with information regarding water, sanitation, and food preparation while travelling as well as proper hand washing techniques.
Health Settings Management	
Infection Control Measures in Health Care Settings	Contact precautions.
Occupational Health	Contact precautions especially for handling of feces.
Surveillance	
Case Definition	**Confirmed case:** Laboratory confirmation of infection in a person with or without clinical illness (see below): • Demonstration of *Cyclospora cayetanensis* oocytes in stool, duodenal/jejunal aspirate or small bowel biopsy. **Probable case:** Clinical illness (see below) in a person with evidence of: • An epidemiological link to a confirmed case either by consumption of the same food or exposure to food known to be handled by a confirmed case, **OR** • A history of travel to a cyclospora-endemic area. **Clinical illness:** Clinical illness is characterized by watery diarrhea, loss of appetite, weight loss, abdominal bloating and cramping, increased flatus, nausea, fatigue and low-grade fever. Vomiting may also be noted. Relapses and asymptomatic infections can occur.
Reporting Requirements and Forms	**Cyclosporiasis is a notifiable infection in Nunavut**; however, surveillance is laboratory-based only. Submission of case report forms (routine or enhanced) is **not required**, unless specifically requested by the Chief Medical Officer of Health (CMOH)/Deputy CMOH or designate. Report outbreaks to the EHO, who will report these to the Office of the CMOH.

Tools	
Guidelines	
Materials & Resources	
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Cyclosporiasis-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at : http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 9, 2015.

4.7.1 Giardiasis

Special Precautions/Considerations

Precautions: Routine and Contact

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Giardiasis is caused by the protozoa *Giardia lamblia*. The organism is found in two forms, a trophozoite and a cyst. The trophozoite is relatively fragile and dies when excreted from the body. The cyst form is environmentally resistant and thrives in still bodies of water such as ponds and stagnant lakes. It can also be found in fecally contaminated surfaces and food items.
Clinical	
Clinical Presentation	Giardiasis is often asymptomatic. Symptomatic individuals may suffer a broad spectrum of manifestations including the acute onset of intermittent acute watery diarrhea, steatorrhea, abdominal cramps and distention, flatulence, and anorexia. Periods of diarrhea may alternate with constipation until the individual has been treated or the symptoms resolve spontaneously. Vomiting, fever, and tenesmus occur less commonly. One of the most distinguishing features of illness is the prolonged duration of diarrhea. As the disease progresses the stool becomes greasy, foul-smelling, and may float. The malabsorption of fats and fat soluble vitamins can occur with prolonged illness. Weight loss is common. The infection is often self-limited lasting a few weeks to months. Most persons with giardiasis have a relatively benign course of infection; however some individuals, in particular children younger than five years of age and pregnant women, may have severe illness characterized by weight loss and require hospitalization.
Diagnostics	Giardiasis should be considered in persons with prolonged diarrhea especially when associated with malabsorption or weight loss. The diagnosis is most often made by examination of stool for ova and parasites, looking for trophozoites or cysts or by serology EIA. Follow your regional laboratory procedures for testing.
Treatment	Treatment is under the direction of the attending healthcare provider. Symptomatic cases should be treated. Consult with physician for treatment recommendations. Treatment of asymptomatic carriers is generally not recommended.
Pathogen	
Occurrence	**Worldwide**: Worldwide occurrence. *Giardia lamblia* is one of the most common causes of endemic and epidemic diarrhea throughout the world. Prevalence is highest in areas of poor sanitation and in facilities where children are not toilet trained. Waterborne outbreaks have occurred in communities that derive water from sources without a filtration system. **Canada**: The most prevalent enteric parasite in Canada, *Giardia lamblia* is the most frequent cause of non-bacterial diarrhea. Rates are highest in young children. Infection occurs most commonly in July and August. **Nunavut**: From 2007–2011, the number of reported symptomatic cases ranged from 6 –11 per year.

<table>
<tr><td>Reservoir</td><td>Humans, possibly beavers and other wild and domestic animals.</td></tr>
<tr><td>Transmission</td><td>Transmission is fecal-oral, most commonly occurs through the ingestion of contaminated water and occasionally from swimming in contaminated water sources. Surface water can easily become contaminated by the feces of human or animal sources. Routine water treatment does not kill Giardia cysts. Filtration is necessary.

Anal-oral contact may also occur. Foodborne transmission has also been documented. The infectious dose is generally less than 10 cysts and may be as low as one cyst.</td></tr>
<tr><td>Incubation Period</td><td>Usually 3 to 25 days or longer; the median incubation period is 7 to 10 days.</td></tr>
<tr><td>Communicability</td><td>Varies. Giardiasis is communicable during the entire period of infection (as long as a person excretes the cysts), which may last months. About 50% of adults clear the infection spontaneously in 1 to 3 months. Five to 15% of individuals become asymptomatic cyst passers.</td></tr>
<tr><td>Susceptibility and Resistance</td><td>Most common in children less than 5 years of age and in adults 25 to 39 years of age; asymptomatic carrier rates are high. Persons with immunodeficiencies (e.g., HIV or AIDS) can experience a more serious and prolonged illness.</td></tr>
<tr><td colspan="2"><h2>Public Health Management</h2></td></tr>
<tr><td>Case</td><td>Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian.

Investigate cases to determine the source of infection, being sure to obtain the following disease-specific information:
Food and water history (retain all suspected food or water for laboratory analysis based on Environmental Health Officer [EHO] direction).
History of drinking untreated water while out on the land or collected from the land.
History of out of territory or international travel.
History of similar illness in household members.
Cases should be instructed about disease transmission and prevention.

Exclusion is at the discretion of the Chief Medical Officer of Health (CMOH)/Deputy CMOH. Exclusion may be considered for symptomatic persons; consult with the EHO regarding exclusion criteria described below:
<table>
<tr><th>Risk Group</th><th>Criteria for Exclusion</th></tr>
<tr><td>Food Handlers</td><td>Exclude until asymptomatic for 24 hours or for 48 hrs after completion of antibiotic treatment.</td></tr>
<tr><td>Health care, nursery or other staff who have contact with susceptible persons</td><td>Exclude until asymptomatic for 24 hours or for 48 hrs after completion of antibiotic treatment.</td></tr>
<tr><td>Children less than 5 years old attending daycare etc.</td><td>Exclude until asymptomatic for 24 hours or for 48 hrs after completion of antibiotic treatment.</td></tr>
<tr><td>Case contacts who are in special risk groups</td><td>Symptomatic: Exclude until asymptomatic for 24 hours or for 48 hrs after completion of antibiotic treatment.
Asymptomatic: No exclusion required</td></tr>
</table></td></tr>
</table>

	Asymptomatic individuals who are indicated in the above categories are generally not excluded from work or daycare; however the decision to exclude will be made by the CMOH/DCMOH.
Contacts	• Consider household members as close contacts of a case. • Provide contacts with information on transmission and prevention of infection. • Symptomatic contacts should be assessed by a health care provider to determine if they are infected. • Symptomatic contacts may be excluded from daycare or similar facilities or occupations involving food handling, patient care or care of young, elderly or dependent persons. Exclusion is at the discretion of the CMOH/DCMOH as per the criteria above (see Case section).
Outbreaks	If a higher than normal amount of disease activity is detected, contact your EHO.
Health Education	• Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food. • Educate food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products, time-temperature standards, and thorough hand washing. • Ensure thorough cooking and safe handling of meats, especially pork. • Advise infected individuals to avoid food preparation. • Educate about the risk of sexual practices that permit fecal-oral contact. Travelers, hikers and those on the land should be advised of methods to make water safe for drinking, including boiling, chemical disinfection and filtration. • Where water might be contaminated, travelers, campers and hikers should be advised of methods to make water safe for drinking, including boiling, chemical disinfection and filtration.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine and contact precautions
Occupational Health	
Surveillance	
Case Definition	**Confirmed case:** Laboratory confirmation of infection with or without symptoms from stool, duodenal fluid or small bowel biopsy specimen: • Demonstration of *Giardia lamblia* **OR** • Demonstration of *Giardia lamblia* antigen **Probable case:** Clinical illness in a person who is epidemiologically linked to a confirmed case. **Clinical illness:** Clinical illness is characterized by diarrhea, abdominal cramps, bloating, weight loss, fatigue or malabsorption.

Reporting Requirements and Forms	**Giardiasis is a notifiable infection in Nunavut;** however, surveillance is laboratory-based only. Submission of case report forms (routine or enhanced) is **not required**, unless specifically requested by the CMOH/DCMOH or designate. Report outbreaks to the EHO, who will report these to the Office of the CMOH.

Tools

Guidelines	
Materials & Resources	**Fact Sheet: Giardiasis**
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Giardiasis-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at: http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 18, 2015.

4.8.1 Hepatitis A

Special Precautions/Considerations

Precautions: Routine
*Consider Contact precautions for incontinent clients and children under 6.

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Hepatitis A virus (HAV), an RNA picornavirus.
Clinical	
Clinical Presentation	Acute clinical illness is characterized by fever, malaise, anorexia, nausea and abdominal pain followed by jaundice. The disease varies in clinical severity from a mild illness lasting one to two weeks, to a severely disabling disease lasting several months, although this is rare. Prolonged or relapsing disease lasting as long as six months can occur. Fulminant hepatitis is rare but more frequent in individuals with underlying liver disease. In general, severity increases with age, but complete recovery without sequelae or recurrences is the rule. Chronic infection does not occur. Infection usually causes clinical hepatitis in adults and school-aged children but younger children are often asymptomatic. Jaundice develops in less than 10% of children 6 years of age and younger.
Diagnostics	Hepatitis A is not clinically distinguishable from other forms of viral hepatitis; therefore, a diagnosis is established by the demonstration of IgM antibody to HAV (anti-HAV IgM) in the serum of acutely or recently ill persons. IgM is detectable 5-10 days before the onset of symptoms and may remain detectable for 4-6 months after onset. IgM disappears from the serum and IgG persists, conferring lifelong immunity. Follow your regional laboratory procedures.
Treatment	Supportive care. Hepatitis A is a viral disease; antibiotics are of no value in the treatment of the infection.
Pathogen	
Occurrence	**Worldwide:** Hepatitis A occurs worldwide. In developing countries, adults are usually immune and epidemics of hepatitis A are uncommon. In developing countries with poor environmental hygienic conditions, nearly all children are infected with HAV before the age of nine. In developed countries, disease transmission is frequent in travelers to countries where the disease is endemic, daycare centers enrolling diapered children, and in household and sexual contacts of acute cases. **Canada:** Like most industrialized countries, Canada has a relatively low incidence of hepatitis A. Each year, 1,000 to 3,000 cases are reported. The incidence of hepatitis A varies with geography, as well as economic and environmental conditions. In Canada, risk factors for hepatitis A (HA) infection include: • Travel to HA endemic countries. • Household or close contact with an acute HA case. • Men who have sex with men (MSM). • Illicit drug use. • Populations or communities that have high endemic rates of HA or are at risk of HA outbreaks.

	• Household or close contact with children adopted from HA endemic countries. **Nunavut**: There have been 2 reported cases from 2007–2011.
Reservoir	Humans; rarely chimpanzees and other primates.
Transmission	HAV infection is spread directly person to person primarily by the fecal-oral route by either direct contact with an infected individual or indirectly by ingestion of contaminated food or water. Infection may occur by consumption of contaminated ice/water or by ingestion of uncooked or undercooked foods that have been washed in contaminated water. Transmission also occurs through sexual activities that include direct or indirect anal-oral contact but not through exposure to saliva, semen or urine. On rare occasions, transmission has been reported after exposure to HAV-contaminated blood or blood products. The virus may persist for days or weeks in the environment.
Incubation Period	Ranges from 15 to 50 days with an average of 28 to 30 days.
Communicability	Maximum infectiousness occurs during the latter part of the incubation period with peak levels in the 1 to 2 weeks before the onset of illness to 1 week after the onset of jaundice.
Susceptibility and Resistance	Susceptibility is general, however sexual and household contacts are at increased risk of infection. Infection with HAV confers lifelong immunity. In serologic studies of HA vaccines, 95% to 100% of those vaccinated developed protective concentrations of antibody against HA after a single dose of HA vaccine, and nearly 100% seroconverted after receiving two doses. Protective concentrations of antibody will likely persist for at least 20 years, possibly for life, following immunization with two doses of HA vaccine. Immune memory has been demonstrated indicating that protection may persist even when antibodies are no longer measurable.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Investigate cases of hepatitis A to determine the source of infection, being sure to obtain the following disease-specific information: • History of exposure to possible sources (see Transmission section). • Food and water history in the past 30 days. • History of recent (international) travel. All cases should be instructed about disease transmission, appropriate personal hygiene, routine practices, and contact precautions. Provide Health Education to case on transmission and prevention of the disease. Determine if case is a food handler, a health care provider or staff of a childcare (daycare) facility. Exclusion is at the discretion of the Chief Medical Officer of Health (CMOH)/Deputy CMOH. Consult with the EHO regarding exclusion criteria described below:

	<table><tr><th>Risk Group</th><th>Criteria for Exclusion</th></tr><tr><td>Food Handlers</td><td>Exclude until one week after onset of jaundice or if not jaundiced until 14 days after onset of symptoms.</td></tr><tr><td>Health care, child care or other staff who have contact with susceptible persons</td><td>Exclude until one week after onset of jaundice or if not jaundiced until 14 days after onset of symptoms.</td></tr><tr><td>Children less than 5 years old attending daycare etc.</td><td>Exclude until one week after onset of jaundice or if not jaundiced until 14 days after onset of symptoms.</td></tr></table>
Contacts	Determine the potential contacts during the infectious period (14 days before the onset of symptoms to 7 days after the onset of jaundice). Identify all contacts, in particular: • Those living in the same household. • Persons who are close non-household contacts such as sexual partners or drug sharing partners. • Co-workers and clients of infected food handlers. Post-exposure prophylaxis should be offered to household and close contacts of proven or suspected cases of HAV. Post-exposure prophylaxis is generally not necessary for other contacts, such as school, workplace or health care workers caring for HAV cases unless an outbreak is suspected, however this decision is at the discretion of the CMOH/DCMOH. Hepatitis A vaccine and immune globulin are used for post-exposure prophylaxis as described below. Contact your RCDC for additional information. **Hepatitis A vaccine** Hepatitis A vaccine is effective as post-exposure prophylaxis to prevent infection in contacts and is recommended in preference to immune globulin for people over one year of age. One dose of hepatitis A vaccine should be given to susceptible contacts as soon as possible and preferably within 14 days of last exposure. However, hepatitis vaccine should still be considered if more than 14 days have elapsed since last exposure, as there are no data on the outer limit of efficacy. **Immune globulin (Ig)** Ig is the recommended post-exposure immunoprophylactic agent for infants less than one year of age, for those for whom vaccine is contraindicated, and if hepatitis A vaccine is unavailable. Immunocompromised people should receive Ig in addition to hepatitis A vaccine because they may not respond fully to the vaccine. For post-exposure prophylaxis, give Ig as soon as possible after an exposure. Efficacy of Ig is unknown after 14 days post exposure. See Immunization Manual for protocols for Hepatitis A vaccine and Ig. • Provide contacts with information on transmission and prevention of infection. • Symptomatic contacts that work in high risk settings should be assessed by a health care provider to determine if they are infected. • Exclusion is at the discretion of the CMOH/DCMOH as per the criteria above (see Case section).
Outbreaks	If a higher than normal amount of disease activity is detected, contact your Environmental Health Officer (EHO).

Health Education	• Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food. • Educate food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products, time-temperature standards, and thorough hand washing. • Advise infected individuals to avoid food preparation. • Educate about the risk of sexual practices that permit fecal-oral contact. • Educate about condom use for safer sex. • Persons traveling to countries where HAV is endemic should receive hepatitis A vaccine prior to travel.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine. Consider Contact precautions for incontinent clients and children under 6.
Occupational Health	Gown and gloves if risk of contact with feces.
Surveillance	
Case Definition	**Confirmed case:** Laboratory confirmation of infection in the absence of recent vaccination: • Detection of immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) AND • Acute clinical illness (see below) OR • An epidemiologic link to a person with laboratory-confirmed hepatitis A infection. **Probable case:** Acute illness in a person without laboratory confirmation of infection who is epidemiologically linked to a confirmed case. **Clinical illness:** Acute clinical illness is characterized by discrete onset of symptoms, including fever, malaise, anorexia, nausea and abdominal pain followed by jaundice or elevated aminotransferase levels within a few days.
Reporting Requirements and Forms	**Hepatitis A is a notifiable infection in Nunavut**; however, surveillance is laboratory-based only. Submission of case report forms (routine or enhanced) is **not required**, unless specifically requested by the CMOH/DCMOH or designate. Report outbreaks to the EHO immediately, who will report these to the Office of the CMOH.
Tools	
Guidelines	
Materials & Resources	**Fact Sheet: Hepatitis A** Nunavut Immunization Manual: Hepatitis A vaccine and Immune globulin sections
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Hepatitis-A-2013.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Public Health Agency of Canada, 2006. Canadian Immunization Guide, Seventh Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-hepa-eng.php

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 2015.

4.9.1 Listeriosis, Invasive

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	*Listeria monocytogenes* are small gram-positive, non-spore forming, aerobic bacilli. The bacteria survive well in soil, water, food, and feces. They are able to grow at low temperatures (3°C to 45°C) and are resistant to freezing and drying.
Clinical	
Clinical Presentation	The clinical manifestations of infection range from a mild febrile gastroenteritis in healthy hosts to severe illness in pregnant women and the immunocompromised. Symptoms may include fever, muscle aches, and on occasion, nausea and vomiting. The bacteria may infect the brain and the membrane lining the brain causing meningoencephalitis, with sudden onset of fever, intense headache, nausea, and vomiting. Infected pregnant women may have minimal symptoms typically characterized by a mild flu-like illness, but may unknowingly pass the illness to their unborn child. Infants may be stillborn or born with septicaemia, or may develop meningitis in the neonatal period even though the mother may be asymptomatic at delivery. The case fatality rate is 30% in newborns and approaches 50% if the onset if illness occurs within the first four days of life.
Diagnostics	The diagnosis is confirmed by isolation of the bacteria from CSF, blood, amniotic fluid, placenta, meconium, lochia, gastric washings, and other sites of infection. *Listeria monocytogenes* can be readily isolated from normally sterile sites on routine media. Follow your regional laboratory procedures.
Treatment	Immediate treatment is essential. Consult with an infectious disease specialist for treatment recommendations.
Pathogen	
Occurrence	**Worldwide:** Listeriosis occurs worldwide. Illness is rare and most infections are asymptomatic. **Canada:** Invasive Listeriosis has been reportable in Canada since 1990. From 1990 to 1999, the rate remained below 1/100,000. **Nunavut**: There have been no reported cases from 2007–2011.
Reservoir	*Listeria monocytogenes* is ubiquitous. It has been isolated in soil, dust, water, and foods. The primary reservoirs are soil and decomposing organic matter. Other reservoirs include the intestinal tract of domestic and wild mammals, fowl, and, on occasion, humans. Asymptomatic fecal carriage occurs in man (10%) and animals. The bacteria are frequently found in free-living water and mud. Soft cheeses may support the growth of *Listeria* during ripening and have caused outbreaks. Unlike most other foodborne pathogens, *Listeria* is extremely hardy and can multiply in refrigerated foods that are contaminated.
Transmission	A substantial proportion of sporadic cases results from foodborne transmission. Livestock become infected after ingesting contaminated silage or water; vegetables and fruit may become contaminated from the soil or from manure used as a fertilizer. The bacterium has been found in raw foods, such as

	uncooked meats and vegetables, as well as in processed foods that become contaminated after processing, such as soft cheeses and ready-to-eat meats such as hot dogs and deli meats. Unpasteurized milk or food made from unpasteurized milk may contain the bacterium. In neonatal infections, the organism can be transmitted from mother to fetus *in utero*, or during passage through the infected birth canal.
Incubation Period	Variable, and longer than most common foodborne pathogens; incubation ranges from 3 to 70 days with an estimated median of 3 weeks.
Communicability	Mothers of infected newborns can shed the bacteria in vaginal discharges and urine for 7-10 days after delivery, rarely longer. Infected persons may retain the bacteria in their stools for several months; however, secondary infections among household contacts have not been identified.
Susceptibility and Resistance	Fetuses and newborns are highly susceptible. Infection in children and young adults generally cause less severe disease than in the immunocompromised and the elderly. There is a strong association between decreased immunity and invasive listeriosis, and disease is often superimposed on other debilitating illnesses or conditions such as malignancy, organ transplantation, diabetes, cirrhosis, renal disease, HIV infection and those on immune suppressing medications. There is little evidence of acquired immunity, even after prolonged severe infection.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, proxy, parent or guardian. Complete the ***Food and Waterborne Illness Investigation Form*** dated March 2014 or later. Identify epidemiologically linked contacts. Assess for similar symptoms in individuals who consumed the source (if identified).
Contacts	• No public health intervention is required for contacts as person to person transmission rarely occurs. • Symptomatic and asymptomatic contacts should be investigated if a common source is suspected.
Outbreaks	If even a single case of Listeriosis is detected, contact your Environmental Health Officer (EHO).
Health Education	• Thoroughly cook raw food from animal sources (e.g., beef, pork, and poultry). • Thoroughly wash raw vegetables and fruit before eating. • Keep uncooked meats separate from vegetables, cooked foods, and ready-to-eat foods. • Avoid consumption of unpasteurized milk or foods made from raw milk. • Wash hands, knives, and cutting boards after handling uncooked foods. • Additional recommendations for persons at high risk (those immunocompromised by illness or medications, pregnant women, and elderly persons) include: o Avoid unpasteurized milk and milk products. o Avoid ready-to-eat meats unless heating until steaming hot. o Reheat leftovers or foods such as hot dogs until steaming hot.

Health Settings Management

Infection Control Measures in Health Care Settings	Routine
Occupational Health	

Surveillance

Case Definition	**Confirmed Case** Laboratory confirmation of infection with symptoms (see below): • Isolation of *Listeria monocytogenes* from a normally sterile site (e.g., blood or cerebrospinal fluid (CSF), joint, pleural, or pericardial fluid) **OR** • In the setting of miscarriage or stillbirth, isolation of *L. monocytogenes* from placental or fetal tissue (including amniotic fluid and meconium). **Clinical Illness:** Invasive clinical illness is characterized by meningitis or bacteremia. Infection during pregnancy may result in fetal loss through miscarriage, stillbirth, neonatal meningitis or bacteremia.
Reporting Requirements and Forms	**Invasive Listeriosis is a notifiable infection in Nunavut:** 1. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later. 2. Fax the form, within 7 days of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: o Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 o All other Qikiqtaaluk communities: 867-473-2657

Tools

Guidelines	
Materials & Resources	**Fact Sheet: Listeriosis**
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Listeriosis-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Nova Scotia Communicable Diseases Manual. Available online at : http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 19, 2014.

4.10.1 Norovirus

Special Precautions/Considerations

Precautions: Contact precautions

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Noroviruses are a group of viruses that can cause gastroenteritis. The group of viruses have also been called Norwalk-like viruses.
Clinical	
Clinical Presentation	Acute onset of nausea, vomiting, non-bloody diarrhea, abdominal pain, myalgia, headache, malaise, low-grade fever or a combination of these symptoms, generally lasting 24 to 48 hours.
Diagnostics	The diagnosis is confirmed by isolation of the virus from stool. In general, laboratory testing is only performed in relation to gastrointestinal illness outbreak investigations. Follow your regional laboratory procedures.
Treatment	Treatment is supportive.
Pathogen	
Occurrence	**Worldwide:** Norovirus is a common source of diarrhea and vomiting worldwide. **Canada**: Norovirus is a common source of diarrhea and vomiting in Canada. The number of cases is unknown as individual cases of norovirus are not nationally notifiable. **Nunavut**: Norovirus is a common cause of diarrhea and vomiting in Nunavut.
Reservoir	Humans are the only known reservoir. The main source is stool and vomit from infected persons.
Transmission	Transmission by the fecal-oral route. Person-to-person transmission occurs either directly or indirectly through environmental contact such as contaminated food, water and fomites. Aerosolized transmission from vomitus has been reported. Single or multiple modes of transmission have been reported.
Incubation Period	24 to 48 hours.
Communicability	Usually occurs during the acute stage of the illness, but can be up to 48 hours after the diarrhea stops and sometimes longer.
Susceptibility and Resistance	Universal susceptibility. Immunity does not develop after infection. Norovirus illness can be serious, especially for young children and older adults.
Public Health Management	
Case	Individual cases of norovirus are not typically followed by public health. Only outbreaks are to be reported to public health. Any exclusions will be at the discretion of the Chief Medical Officer of Health (CMOH)/Deputy CMOH and will be according to the general guidelines for enteric illness (Appendix A).
Contacts	Contacts of norovirus cases are typically not followed by public health.
Outbreaks	If an outbreak of norovirus is suspected, contact your Environmental Health Officer (EHO).
Health Education	• Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food.

	• Advise infected individuals to stay home if they are ill. • Advise infected individuals to avoid food preparation. • Thoroughly clean floors, counters, commonly touched surfaces and bathrooms when someone is ill. • Immediately remove and wash clothes or linens that may be contaminated with vomit or feces. • Food handlers and health care workers should not return to work until 48 hours after symptoms have stopped.
Health Settings Management	
Infection Control Measures in Health Care Settings	Contact precautions
Occupational Health	Health care workers should not return to work until 48 hours after symptoms have stopped.
Surveillance	
Case Definition	**Confirmed Case** Clinical illness (see below) with laboratory confirmation of infection: • Detection of norovirus nucleic acid (e.g., PCR) in stool. **Probable Case** Clinical illness (see below) in a person who is epidemiologically linked to a confirmed norovirus case. **Individual cases of norovirus are not typically followed by public health. Only outbreaks are to be reported to public health. Any exclusions will be according to the general guidelines of enteric illness (Appendix A).** **Confirmed outbreak** Three or more cases of clinical illness compatible with norovirus that can be epidemiologically linked to one another (e.g., associated by exposure with onsets within a 1-3 day period), at least one of which is laboratory confirmed. **Institutional outbreak** Three or more cases of clinical illness compatible with norovirus that are epidemiologically linked in an institutional setting. **Clinical illness** Clinical illness is characterized by acute onset of nausea, vomiting, diarrhea, abdominal pain, myalgia, headache, malaise, low grade fever or a combination of these symptoms, lasting 24-48 hours.
Reporting Requirements and Forms	**Norovirus outbreaks are notifiable in Nunavut**; however, submission of case report forms (routine or enhanced) is **not required**, unless specifically requested by the CMOH/DCMOH or designate. Report outbreaks to the EHO immediately, who will report these to the Office of the CMOH.
Tools	
Guidelines	
Materials & Resources	**Fact Sheet: Norovirus**
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Norovirus-2013.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at: http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 9, 2015.

4.11.1 Paralytic Shellfish Poisoning

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Paralytic Shellfish Poisoning (PSP) is caused by the presence in shellfish of marine biotoxins, saxitoxins and gonyautoxins produced by microscopic plants, Alexandrium species and other dinoflagellates. Concentration of these toxins occurs during massive algal blooms known as "red tides" but also in the absence of recognizable algal bloom.
Clinical	
Clinical Presentation	PSP is a potent neurotoxin that can pose a severe health threat. The intensity and progression of the symptoms are dependent on the type and amount of the toxin ingested and the level of concentration of the toxin in the shellfish. Symptoms begin with a tingling sensation or numbness around the lips within 5 to 30 minutes of ingestion, gradually spreading to the face and neck. Other symptoms may include prickly sensation in the fingertips/toes, headache, dizziness or a “floating” sensation. Gastrointestinal symptoms such as nausea, vomiting and abdominal pain are less common. Symptoms usually resolve within a few hours to a few days. In severe cases, incoherent speech, a prickly sensation in the arms and legs, stiffness and non-co-ordination of limbs, weakness and a rapid pulse may occur. In extreme cases, the respiratory muscles may become paralyzed leading to respiratory arrest and death within 2 to 12 hours after consumption.
Diagnostics	A diagnosis of PSP should be considered based on observation of clinical symptoms with recent consumption of shellfish. Confirmation of the diagnosis can be made by detection of the toxin in samples of stomach contents, water or food. Follow your regional laboratory procedures.
Treatment	There is no known antidote for PSP. Respiratory support may be indicated.
Pathogen	
Occurrence	**Worldwide:** Paralytic shellfish poisoning has occurred worldwide and is common in shellfish harvested from waters above 30°N and below 30°S. The most common areas are the northwest and northeast United States, southern Chile, the North Sea and Japan. Paralytic shellfish poisoning is uncommon in North America with small clusters occurring sporadically mainly in coastal locations. **Canada:** Shellfish can have high levels of marine toxins during any given month depending on environmental conditions however, algal blooms of dinoflagellates usually occur during the warmer months of June to October. Cases of PSP are likely rare in Canada but also may be under reported as it was only been made nationally notifiable in 2008. **Nunavut**: There have been no reported cases from 2007–2013.
Reservoir	Contaminated shellfish, including oysters, clams, mussels and certain crabs and snails.
Transmission	Consumption of raw or cooked contaminated shellfish.
Incubation Period	Symptoms usually occur within a few minutes to 10 hours after ingestion.
Communicability	Not applicable; not transmitted person to person.

Susceptibility and Resistance	Variable; some individuals have a natural tolerance to large amounts of the toxin and others have demonstrated an acquired tolerance. Children are more susceptible. Alcohol consumption may have a protective effect against the toxins by having a diuretic effect.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the ***Food and Waterborne Illness Investigation Form*** dated March 2014 or later. Determine the possible source of the infection taking into consideration the incubation period and reservoir. Assessment may include: • Determining history of travel, • Taking a food history for shellfish consumption, • Determining where the case purchased or consumed shellfish (e.g., restaurant, fish vendor, grocery store), and/or • If the case harvested the shellfish, determine the area where it was harvested. Identify epidemiologically linked contacts. Assess for similar symptoms in individuals who consumed the source (if identified). Suspected contaminated shellfish may be held to prevent consumption and sent to CFIA for testing based on Environmental Health Officer (EHO) direction.
Contacts	• Although not transmissible from person to person, contact follow-up is recommended for those who may have shared the same food as a case. • These individuals should be instructed in disease symptoms, when to seek medical attention, transmission, incubation period and preventive measures. • Symptomatic contacts should be instructed to seek immediate medical attention.
Outbreaks	If even a single case of PSP is suspected, contact your EHO.
Health Education	• Consumers should exercise caution when purchasing or harvesting bivalve shellfish. o Shellfish should only be purchased from a reputable retail store or restaurant as the shellfish sold in these establishments come from a federally inspected shellfish processing plant. • Bivalve shellfish are highly perishable and should be refrigerated or frozen until they are ready to be eaten. The toxins are heat stable and water soluble and not destroyed by cooking or freezing. The toxins are not detectable by sight or smell. • As PSP can occur in other countries, tourists should be cautious when consuming shellfish abroad.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine
Occupational Health	

Surveillance

Case Definition	**Confirmed Case** Clinical illness (see below) and: • Detection of saxitoxin in epidemiologically-related, ingested shellfish[1]. OR • Detection of high levels of dinoflagellates associated with shellfish poisoning in water from which epidemiologically-related shellfish[1] were gathered. **Probable Case** Clinical illness (see below) within 12 hours of consumption of bivalve mollusc shellfish[1] (e.g., oysters, clams, mussels). **Clinical Illness:** Clinical illness is characterized by neurological symptoms such as paresthesia and/or paralysis involving the mouth and extremities, which may be accompanied by gastrointestinal symptoms. [1]The shellfish most associated with saxitoxin (PSP) include bivalve molluscs (e.g., oysters, clams, and mussels), non-bivalve shellfish (e.g., whelks, moon snails and dogwinkles) or tomalley of crustaceans (e.g., crabs, lobster).
Reporting Requirements and Forms	**Shellfish poisoning is a notifiable infection in Nunavut:** 1. Notify your EHO if during regular business hours, or the Public Health Emergency Contact if after regular business hours at 867-975-5772. 2. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later. 3. Fax the form, within 24 hours of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: o Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 o All other Qikiqtaaluk communities: 867-473-2657 4. If you cannot contact your EHO, contact the Territorial Environmental Health Specialist at 867-975-5782.

Tools

Guidelines	
Materials & Resources	
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Shellfish-Poisoning-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at:

http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Nova Scotia Communicable Diseases Manual. Available online at: http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on March 16, 2014.

4.12.1 Paratyphoid

Special Precautions/Considerations

Precautions: Routine
*Consider Contact precautions for incontinent clients and children under 6.

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Caused by the gram negative bacillus *Salmonella* Paratyphi.
Clinical	
Clinical Presentation	Characterized by insidious onset of sustained fever, dull frontal headache, malaise, myalgia, non-productive cough, anorexia, nausea and abdominal discomfort. Constipation is more common than diarrhea. The clinical presentation is highly variable, ranging from mild illness with low-grade fever to severe clinical disease with multiple complications.
Diagnostics	*S.* Paratyphi can be isolated from blood early in the disease and from urine and feces after the first week of illness. Blood culture is the diagnostic mainstay. Follow your regional laboratory procedures.
Treatment	• Evidence suggests fluoroquinolones are the drug of choice in adults, however resistance has been observed. • Consult with an infectious disease specialist for treatment recommendations.
Pathogen	
Occurrence	**Worldwide:** Paratyphoid occurs worldwide. Most of the burden of illness occurs in the developing world. An estimated 6 million cases of paratyphoid fever occur worldwide annually. **Canada:** The incidence of paratyphoid remains very low in Canada. In 1999, S. paratyphoid infection was removed from the nationally notifiable disease list as a separate entity and was included under Salmonella infections. **Nunavut**: There have been no reported cases from 2007–2011.
Reservoir	Humans, rarely animals.
Transmission	Fecal-oral from person to person, or by ingestion of food or water contaminated by feces or urine of the infected person. Consumption of shellfish harvested from beds contaminated by sewage or fruits and vegetables fertilized by human waste and eaten raw.
Incubation Period	From 1 to 10 days.
Communicability	Communicable as long as organisms are excreted; from the appearance of prodromal symptoms, throughout illness and for a period of up to 2 weeks after symptom onset. Few persons with paratyphoid infection become chronic carriers.
Susceptibility and Resistance	Susceptibility is general and is increased in individuals with gastric achlorhydria and possibly in those who are HIV positive. Relative specific immunity follows recovery from clinical disease and inapparent infection.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian.

Investigate cases of paratyphoid to determine the source of infection, being sure to obtain the following disease-specific information:

- History of recent international travel.
- History of exposure to possible sources (see Transmission section).
- Food and water history in the 10 days prior to symptom onset.

All cases should be instructed about disease transmission, appropriate personal hygiene, routine practices, and contact precautions.

Provide Health Education to case on transmission and prevention of the disease.

Identify close contacts (see Contacts section).

Determine if case is a food handler, a health care provider or staff of a childcare (daycare) facility. Exclusion is at the discretion of the Chief Medical Officer of Health (CMOH)/Deputy CMOH. Consult with the EHO regarding exclusion criteria described below:

Risk Group	**Criteria for Exclusion**
Food Handlers	Exclude until 3 consecutive stool samples are negative. They are to be collected one week apart and at least 24 hrs after cessation of symptoms. If treated, then specimens must be collected at least two weeks after completion of antibiotic treatment.
Health care, nursery or other staff who have contact with susceptible persons	Exclude until 3 consecutive stool samples are negative. They are to be collected one week apart and at least 24 hrs after cessation of symptoms. If treated, then specimens must be collected at least two weeks after completion of antibiotic treatment.
Children less than 5 years old attending daycare etc	Exclude until 3 consecutive stool samples are negative. They are to be collected one week apart and at least 24 hrs after cessation of symptoms. If treated, then specimens must be collected at least two weeks after completion of antibiotic treatment.
Case contacts who are in special risk groups	*Symptomatic:* Exclude and have stool samples cultured for confirmation. If positive, handle as a case. If negative, exclude until symptoms have cleared and stools are well formed. *Asymptomatic:* This must be evaluated on a case by case basis.

Carriers:

If a person remains positive for more than 12 months, they may be considered a chronic carrier. Maintain surveillance of chronic carriers until they are cleared; this requires they submit 3 consecutive negative stool cultures, taken not less than 24 hours apart and at least 48 hours after the termination of any

	antibiotic therapy. Chronic carriers may submit one culture a month. Discuss with the CMOH/DCMOH.
Contacts	• Consider household members as close contacts of a case. • Provide contacts with information on transmission and prevention of infection. • Symptomatic contacts that work in high risk settings should be assessed by a health care provider to determine if they are infected. • Exclusion is at the discretion of the CMOH/DCMOH as per the criteria above (see Case section).
Outbreaks	If even a single case of paratyphoid is detected, contact your Environmental Health Officer (EHO).
Health Education	• Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food. • Educate food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products, time-temperature standards, and thorough hand washing. • Advise infected individuals to avoid food preparation. • Educate about the risk of sexual practices that permit fecal-oral contact. • Educate about the dangers of consuming raw or unpasteurized milk or other dairy products. • Educate about the dangers of consuming undercooked meat, poultry, and eggs (including foods in which raw eggs are present).
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine. Consider Contact precautions for incontinent clients and children under 6.
Occupational Health	
Surveillance	
Case Definition	**Confirmed Case** Clinical illness (see below) with laboratory confirmation of infection: • Isolation of *Salmonella* Paratyphi from an appropriate clinical specimen. **Clinical Illness:** Clinical illness is characterized by headache, diarrhea, abdominal pain, nausea, fever and sometimes vomiting. Asymptomatic infections may occur, and the organism may cause extra-intestinal infections.
Reporting Requirements and Forms	**Paratyphoid is a notifiable infection in Nunavut**: 1. Notify your EHO if during regular business hours, or the Public Health Emergency Contact if after regular business hours at 867-975-5772. 2. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later. 3. Fax the form, within 24 hours of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: o Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 o All other Qikiqtaaluk communities: 867-473-2657

	4. If you cannot contact your EHO, contact the Territorial Environmental Health Specialist at 867-975-5782.

Tools

Guidelines	
Materials & Resources	
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Paratyphoid-Fever-2013.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Nova Scotia Communicable Diseases Manual. Available online at: http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 2015.

4.13.1 Salmonellosis

Special Precautions/Considerations

Precautions: Contact

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	*Salmonella enterica,* a gram negative enteric bacillus. There are over 2000 serotypes.
Clinical	
Clinical Presentation	Salmonellosis is a bacterial infection manifested by an acute enterocolitis associated with a sudden onset of headache, abdominal pain and tenderness, diarrhea, nausea, and occasionally vomiting. Dehydration may be a severe complication. Symptoms may last for one or two days or be prolonged depending on host factors, the ingested dose, and strain characteristic. Occasionally, the bacteria may spread to the bloodstream and localize in any tissue of the body, producing abscesses and other systemic complications. Arthritis-type symptoms may follow three to four weeks after onset of acute symptoms. Asymptomatic infection may occur. Death is uncommon, except in the very old, the very young and in persons with compromised immune systems.
Diagnostics	The diagnosis is made through the isolation of *Salmonella* from feces, rectal swabs or other body fluids. Freshly passed stool is preferred. Specimens should be collected over several days as excretion of the bacteria may be intermittent. Collect stool for culture and sensitivity (C&S) test. Follow your regional laboratory procedures.
Treatment	None, antibiotic treatment may lengthen the period of communicability. Under special circumstances an antibiotic may be given (i.e., infants under 2 months, the elderly, and individuals with HIV infection).
Pathogen	
Occurrence	**Worldwide:** Worldwide occurrence. Salmonellosis is endemic in some parts of the world with the highest attack rates in persons less than five years and greater than 70 years of age. It is believed that only a small proportion of cases are acknowledged. In developed countries, it is estimated that only about 1% of clinical cases are reported. **Canada**: Since 1988, there has been a slight overall decline in the number of cases reported in Canada. Currently, about 5,500 cases are reported in Canada each year, but this number is considered an underestimate. Infants and young children have the highest incidence. **Nunavut**: There have been an average 16 reported cases per year from 2007–2011 (range 6–34 cases per year).
Reservoir	The reservoir for salmonellosis includes a wide range of domestic and wild animals, including poultry, swine, cattle, rodents, and pets such as iguanas, tortoises, turtles, terrapins, snakes, chicks, dogs and cats. Humans may also serve as a reservoir (e.g., acute cases, convalescent carriers and mild and unrecognized illness). Chronic carriers in humans are rare but common in animals and birds.

<table>
<tr><td>Transmission</td><td>Fecal-oral, from person/animal to person, or by ingestion or handling of food derived from infected animals or contaminated by the feces of an infected person or animal.</td></tr>
<tr><td>Incubation Period</td><td>Varies from 6 to 72 hours, usually 12-36 hours.</td></tr>
<tr><td>Communicability</td><td>Shedding of the bacteria in stool occurs throughout the entire infection; usually several days to several weeks. A temporary carrier state usually continues for months, especially in infants. Depending on the serotypes, approximately 1% of infected adults and 5% of children less than 5 years of age may excrete the organism for more than one year.</td></tr>
<tr><td>Susceptibility and Resistance</td><td>Susceptibility is general but may be increased by antacid treatment, gastrointestinal surgery, prior or current broad-spectrum antibiotic therapy, neoplastic disease, and other immunosuppressive conditions including malnutrition.</td></tr>
<tr><td colspan="2"><h2>Public Health Management</h2></td></tr>
<tr><td>Case</td><td>Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the Food and Waterborne Illness Investigation Form dated March 2014 or later.

Investigate cases of salmonellosis to determine the source of infection, being sure to obtain the following disease-specific information:
History of exposure to possible sources (see Transmission section).
Food history in the past 3 days.
History of recent (international) travel.
All cases should be instructed about disease transmission, appropriate personal hygiene, routine practices, and contact precautions.

Determine if case is a food handler, a health care provider or staff of a childcare (daycare) facility. Exclusion is at the discretion of the Chief Medical Officer of Health (CMOH)/Deputy CMOH. Consult with the EHO regarding exclusion criteria described below:<table><tr><th>Risk Group</th><th>Criteria for Exclusion</th></tr><tr><td>Food Handlers</td><td>Exclude until asymptomatic and client has two well formed stools.</td></tr><tr><td>Health care, nursery or other staff who have contact with susceptible persons</td><td>Exclude until asymptomatic and client has two well formed stools.</td></tr><tr><td>Children less than 5 years old attending daycare etc.</td><td>Exclude until asymptomatic and client has two well formed stools.</td></tr><tr><td>Case contacts who are in special symptomatic risk groups</td><td>Symptomatic: Exclude until asymptomatic and client has two well formed stools.
Asymptomatic: No exclusion required</td></tr></table></td></tr>
<tr><td>Contacts</td><td>Consider household members as close contacts of a case.
Provide contacts with information on transmission and prevention of infection.
Symptomatic contacts that work in high risk settings should be assessed by a health care provider to determine if they are infected.
Exclusion is at the discretion of the CMOH/DCMOH as per the criteria above (see Case).</td></tr>
</table>

Outbreaks	If a higher than normal amount of disease activity is detected, contact your Environmental Health Officer (EHO).
Health Education	• Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food. • Educate food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products, time-temperature standards, and thorough hand washing. • Avoid raw eggs in food preparation (e.g. eggnog, salad dressings, ice cream or desserts). Do not use cracked or dirty eggs. Cook eggs until the yolks are firm. • Advise infected individuals to avoid food preparation. • Educate about the risk of sexual practices that permit fecal-oral contact. • Test private water supplies for presence of bacterial contamination, if suspected. • Encourage good hand washing after contact with animal feces and after handling reptiles and other pets. • Reptiles, chicks and ducklings are particularly likely to have Salmonella. • Educate about the dangers of consuming raw or unpasteurized milk or other dairy products. • Educate about the dangers of consuming undercooked meat, poultry, and eggs (including foods in which raw eggs are present).
Health Settings Management	
Infection Control Measures in Health Care Settings	Contact precautions if patient unable to control feces.
Occupational Health	
Surveillance	
Case Definition	**Confirmed case:** Laboratory confirmation of infection with or without clinical illness: • Isolation of Salmonella sp. (excluding *Salmonella typhi*) from an appropriate clinical specimen (e.g. sterile site, deep tissue wounds, stool, vomit or urine) **Probable case:** Clinical illness in a person who is epidemiologically linked to a confirmed case **Clinical illness:** Clinical illness is characterized by headache, diarrhea, abdominal pain, nausea, fever and sometimes vomiting. Asymptomatic infections may occur, and the organism may cause extra-intestinal infections.
Reporting Requirements and Forms	**Salmonellosis is a notifiable infection in Nunavut:** 1. Notify your EHO if during regular business hours, or the Public Health Emergency Contact if after regular business hours at 867-975-5772. 2. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later. 3. Fax the form, within 24 hours of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102

	• Qikiqtaaluk: o Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 o All other Qikiqtaaluk communities: 867-473-2657 4. If you cannot contact your EHO, contact the Territorial Environmental Health Consultant at 867-975-5782.

Tools

Guidelines	
Materials & Resources	**Fact Sheet: Salmonella**
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Salmonellosis-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Nova Scotia Communicable Diseases Manual. Available online at : http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 9, 2015.

4.14.1 Shigellosis

Special Precautions/Considerations

Precautions: Direct and Indirect Contact

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Shigellosis is an acute bacterial disease caused by gram negative bacilli in the family Enterobacteriaceae. It is the most communicable of the bacterial diarrheas. Some strains produce enterotoxin and shigatoxin (much like the verotoxin of *E. coli* O157:H7). Approximately 40 serotypes are divided into four groups: • Group A - *Shigella dysenteriae* • Group B - *Shigella flexneri* • Group C - *Shigella boydii* • Group D - *Shigella sonnei*
Clinical	
Clinical Presentation	An acute bacterial disease involving the distal small intestine and colon, characterized by watery, loose stools, accompanied by fever, nausea and vomiting in mild cases. Sometimes, toxemia, abdominal cramps and tenesmus with mucoid stools with or without blood in more severe cases. Illness is usually self-limiting, lasting an average of 4 to 7 days. Asymptomatic infections occur. Severity and case-fatality vary with the age of the host and the serotype of *Shigella*.
Diagnostics	Diagnosis is made by the isolation of *Shigella* from feces or a rectal swab. The infection is generally associated with a high number of leukocytes (pus cells) in the fecal matter. *Shigella* remains viable outside the human body for only a short period of time hence, specimens must be processed rapidly after collection, preferable within 24 hours. Serological testing is not generally helpful. Follow your regional laboratory procedures for testing.

Treatment	Treatment is under the direction of the attending healthcare provider. Consult with physician for treatment recommendations.
	• Fluids and electrolyte replacement if excessive fluid loss through diarrhea or vomiting.
	• Antimotility agents are not recommended as they may prolong the course of disease.
	• Treatment is recommended for most symptomatic patients. Use of antibiotics will shorten the period of fecal excretion of the infecting strain and will shorten the clinical course of disease often to a few days.
	• Antibiotics
	  o If the strain is susceptible, ciprofloxacin or TMP/SMX or azithromycin are recommended for adults and children.
	  o Antibiotic resistance frequently develops after treatment.

Pathogen	
Occurrence	**Worldwide**: Worldwide occurrence. It is estimated that Shigellosis causes 600,000 deaths per year in the world. Reported cases represent only a small proportion of all cases. Secondary attack rates in households have been shown to be as high as 40%. Approximately two thirds of the cases are children under the age of 10. The disease does not often develop in infants less than six months of age.

<table>
<tr><td></td><td>Canada: Periodic outbreaks occur. Young children have been most affected. Outbreaks are most commonly associated with crowded conditions and facilities where hygiene is poor (e.g., jails).

Nunavut: There have been no reported cases from 2007–2011.</td></tr>
<tr><td>Reservoir</td><td>Humans and primates are the reservoir for shigella. The source is most often the feces of infected individuals who have diarrhea. Other potential sources include contaminated food (especially when unrefrigerated, e.g., salads), raw vegetables, milk, dairy products, and water.</td></tr>
<tr><td>Transmission</td><td>The primary mode of transmission is fecal-oral. Transmission occurs through person-to-person contact, ingestion of contaminated food or water, through sexual contact or less commonly through contact with inanimate objects. Risk of transmission occurs particularly among men having sex with men and in areas of overcrowding where sanitation is poor, such as jails, institutions, daycare centres or mental hospitals. Only a very small dose (10-100 bacteria) is required for infection to occur. Multi-antibiotic resistant strains have appeared worldwide, resulting from widespread use of antibiotics.</td></tr>
<tr><td>Incubation Period</td><td>Usually 1 to 3 days, but may range from 12 hours to 1 week.</td></tr>
<tr><td>Communicability</td><td>During acute infection and until the infectious agent is no longer present in feces, usually within 4 weeks after illness. Effective antibiotic therapy reduces communicability to less than a week. Secondary attack rates in households can be as high as 40%. Asymptomatic carriers may transmit infection.</td></tr>
<tr><td>Susceptibility and Resistance</td><td>Susceptibility is general; the elderly, the debilitated and the malnourished of all ages are particularly susceptible to severe disease and death.</td></tr>
<tr><td colspan="2">Public Health Management</td></tr>
<tr><td>Case</td><td>Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian.

Investigate cases to determine the source of infection, being sure to obtain the following disease-specific information:
• Food and water history (retain all suspected food or water for laboratory analysis based on Environmental Health Officer [EHO] direction).
• History of recent (international) travel.
• Sexual history.

Cases should be instructed about disease transmission and prevention.

Exclusion is at the discretion of the Chief Medical Officer of Health (CMOH)/Deputy CMOH. Consult with the EHO regarding exclusion criteria described below:
<table>
<tr><th>Risk Group</th><th>Criteria for Exclusion</th></tr>
<tr><td>Food Handlers</td><td>Exclude until 2 negative stool samples have been obtained at least 24 hours apart and at least 24 hrs after cessation of symptoms or 48 hours after discontinuance of antibiotics and symptoms have cleared.</td></tr>
<tr><td>Health care, nursery or other staff who have contact with susceptible persons</td><td>Exclude until 2 negative stool samples have been obtained at least 24 hours apart and at least 24 hrs after cessation of symptoms or 48 hours after discontinuance of antibiotics and symptoms have cleared.</td></tr>
</table>
</td></tr>
</table>

	Children less than 5 years old attending daycare	Exclude until 2 negative stool samples have been obtained at least 24 hours apart and at least 24 hrs after cessation of symptoms or 48 hours after discontinuance of antibiotics and symptoms have cleared.
	Case contacts who are in special risk groups	*Symptomatic:* Exclude and have stool samples cultured for confirmation. If positive, handle as a case. If negative, exclude until symptoms have cleared and stools are well formed. *Asymptomatic:* This must be evaluated on a case by case basis.
Contacts	• Assess household and other contacts to determine if exposed to the same source. • Contacts should be instructed about disease transmission and prevention. • Symptomatic contacts should be assessed by a healthcare provider. • Contacts that are symptomatic may be excluded from daycare or similar facilities or occupations involving food handling, patient care or care of young, elderly or dependent persons as per CMOH/DCMOH assessment. • Asymptomatic contacts, in general, are not excluded from work or daycare.	
Outbreaks	If a higher than normal amount of disease activity is detected, contact your EHO.	
Health Education	• Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food. • Educate food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products, and thorough hand washing. • Advise infected individuals to avoid food preparation. • Educate about the risk of sexual practices that permit fecal-oral contact. • Educate on condom use for safer sex. • Encourage breastfeeding of infants.	
Health Settings Management		
Infection Control Measures in Health Care Settings	Direct and indirect contact with feces.	
Occupational Health	Gown and gloves for caring for patients with uncontained feces.	
Surveillance		
Case Definition	**Confirmed case:** Laboratory confirmation of infection with or without clinical illness: • Isolation of *Shigella* species from an appropriate clinical specimen (e.g., sterile site, deep tissue wounds, stool, vomit or urine). **Probable case:** Clinical illness in a person who is epidemiologically linked to a confirmed case.	

Reporting Requirements and Forms	**Shigellosis is a notifiable infection in Nunavut**: 1. Notify your EHO if during regular business hours, or the Public Health Emergency Contact if after regular business hours at 867-975-5772. 2. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later. 3. Fax the form, within 24 hours of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: o Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 o All other Qikiqtaaluk communities: 867-473-2657 4. If you cannot contact your EHO, contact the Territorial Environmental Health Specialist at 867-975-5782.

Tools

Guidelines	
Materials & Resources	
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Shigellosis-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at : http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 18, 2015.

4.15.1 Trichinosis

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	There are many species of *Trichinella* capable of causing infection in mammals, but *Trichinella nativa*, an intestinal nematode, is the etiological agent of Trichinosis in Arctic communities. *T. nativa* differs from other *Trichinella* species in that it is very resistant to freezing and may be more an intestinal disease and less muscle invasive than other strains. Cysts have remained viable for many years. In other regions, *T. spiralis* is a common cause of human infection. Illness is caused by intestinal roundworms whose larvae migrate to and become encysted in muscles.
Clinical	
Clinical Presentation	Clinical illness in humans is highly variable and ranges from inapparent infection to fulminating, fatal illness, depending on dose ingested. Gastrointestinal symptoms may appear first, including diarrhea, nausea and abdominal pain. Other early signs of infection can include muscle soreness, fever and edema of upper eyelids. Thirst, profuse sweating, chills and weakness follow. Cardiac and neurological conditions may appear in 3-6 weeks. Symptomatic individuals are often not recognized because many people with a previous history of infection will (only) have diarrhea, a fairly common presenting problem. Rash and fever are also very common presenting conditions. Usually the Health Centre and community do not realize that anything is amiss until numerous persons have presented. Two distinct syndromes have been described in outbreaks in the Arctic, the classic “myopathic” form with edema, fever, fatigue, rash and muscle pain and a “diarrheic” form with persistent diarrhea with little fatigue or muscle pain. Sometimes the clinical picture is mixed. Previous research in Arctic communities suggests that the “myopathic” form represents a primary infection while the “diarrheic” form represents re-infection of individuals who have pre-existing immunity to *T. nativa.* Attack rates, the number of people who get sick from having consumed contaminated meat, are usually around 50%. Individuals may be unaware of which animal they consumed, and not all cuts of meat are equally contaminated – the larval form of *T. nativa* may have predisposition to certain muscle groups. Trichinosis should be suspected in any person who has any of the cardinal features of periorbital edema, myositis, fever, and eosinophilia in particular if history reveals consumption of poorly cooked meat.
Diagnostics	The diagnosis of Trichinosis is based on history of consumption of potentially contaminated meat, the presence of compatible signs and symptoms, and identification of *Trichinella* larvae in biopsy muscle tissue or specific antibody in serum. Serological tests and marked eosinophilia are helpful in the diagnosis. Antibodies are not detectable until at least 3 weeks after infection. They may be measured by EIA. A diagnostic titre is 1:128. A rising antibody titre may help

	establish the diagnosis. It is recommended to have an acute and convalescent blood sample 4 weeks apart. A muscle biopsy is often positive when taken in the 4th and 5th week after infection (e.g. after consumption of contaminated meat) by demonstrating an un-calcified parasite cyst. Follow your regional laboratory procedures for testing.
Treatment	For treatment purposes, anyone who consumed implicated meat should be considered for treatment if consumption occurred within 3 weeks of presentation. Recommendations: 1. Little value in doing serology in humans – treat based on suspected symptoms and a history of consuming tainted meat (waiting for serology gives sufficient time for the parasite to enter the muscle at which time antiparasitic treatment is not effective) 2. For healthy individuals (>2years old and not pregnant) with i. no symptoms or mild symptoms, treat with 3 days of TID mebendazole (Reference JF Proulx et al Clinical Infectious Diseases, Vol. 34, No. 11 (Jun. 1, 2002), pp. 1508-1514 – study done in Nunavik related to walrus consumption) ii. moderate symptoms, treat with mebendazole 400mg TID for 14 days and consult MD, may benefit from corticosteroids iii. severe symptoms – requires hospitalization and urgent consult with MD 3. For immunosuppressed individuals or children 2-18years i. No symptoms or mild symptoms, treat with mebendazole 400mg TID for 14 days ii. Moderate or severe symptoms or if age less than 2yrs or if pregnant, urgent consult with MD 4. If <2years old or pregnant consult MD Notes: Albendazole may be better absorbed than mebendazole and it is easier to compound for children
Pathogen	
Occurrence	**Worldwide**: Worldwide occurrence. The number of cases depends on the practices used in preparing and eating meat. The disease is often unrecognized or unreported. **Canada**: Throughout the Arctic, but variable in incidence depending on food handling and consumption practices. Recent experience has been of localized outbreaks, based on the informal sharing of food. A harvested animal is often left for individuals to take portions for family consumption. **Nunavut**: On average, Nunavut reports 1-2 community outbreaks per year. Since 1999, outbreaks have been reported in Qikiqtarjuaq, Sanikiluaq, Igloolik, Repulse Bay, and most recently in Cape Dorset (2006).
Reservoir	Animals are the only reservoir for this parasite. This includes swine, dogs, cats, horses, rats and many wild animals such as bear, wolf, fox and marine mammals.

	It can be found in several Arctic mammals but walruses and polar bears (consumed much less frequently than walrus) are associated with outbreaks in humans in Nunavut. Other carnivore species with human outbreak potential are red and arctic foxes and wolves – but they too are very rarely consumed. Trichinosis infection rates in polar bears have ranged from 24-60%, and in walruses between 1-4%. Rates differ from location to location and may increase with the age of the animal. Walrus contamination may increase with age. Young animals feed exclusively on clams, but older ones may become infected through the consumption of other "apex" predators. Approximately one-third of foxes and wolves are infected.
Transmission	By eating of raw, fermented or insufficiently cooked flesh with viable encysted larvae. Larvae develop into adults in the epithelium of the small intestine. Gravid female worms then produce larvae that penetrate the lymphatics or venules and migrate to muscle where encapsulation occurs.
Incubation Period	In previous Arctic outbreaks, an incubation period of 10-15 days is suggested. This can vary from 5-45 days depending on the number of parasites involved; consumption of a highly infected animal may shorten the incubation period.
Communicability	Not directly transmitted from person to person. Animal host likely remains infectious for months and meat from these animals' remains infective until the larvae are killed by sufficient cooking, or irradiation.
Susceptibility and Resistance	Susceptibility is universal; infection results in partial immunity.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later (section 4.15.2). Investigate cases to determine the source of infection, being sure to obtain the following disease-specific information: • Food history (retain all suspected food for laboratory analysis based on Environmental Health Officer [EHO] direction). • History of out of territory or international travel. • History of similar illness in household members. Cases should be instructed about disease transmission and prevention. Symptomatic and asymptomatic individuals are generally not excluded from work or other settings.
Contacts	• Contact management is not indicated, unless exposed to the same source; Trichinosis is not transmitted person-to-person. • Individuals exposed to the suspected source of the infection should be instructed about disease transmission. • Individuals exposed to the suspected source of the infection may be monitored during the incubation period and offered treatment as necessary.
Outbreaks	If a higher than normal amount of disease activity is detected, contact your EHO.

Health Education	• Educate Nunavummiut about the risk of Trichinosis from raw walrus or polar bear meat. Ensure they are aware of the free testing program for meat samples, and not to eat any of the raw meat until the test results are available. Contact your EHO for more information. • Advise those with infected meat not to feed the raw meat to dogs, as dogs can also become ill with Trichinosis. • Cooking meat (allowing all parts to reach at least 74°C) will make it safe to eat right away before test results are available. • Grind pork in separate grinder or clean grinder thoroughly before and after processing other meats.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine
Occupational Health	Not applicable
Surveillance	
Case Definition	**Confirmed case:** • At least one clinically compatible symptom with Trichinosis (edema, muscle pain or diarrhea) and positive serology (OD>=0.30) for Trichinosis and/or eosinophilia (>=15% of white blood count), **OR** • No clinically compatible symptoms with positive serology for both Trichinosis (OD>= 0.30) and eosinophilia (>= 15%). **Probable case:** Clinically compatible symptoms and epidemiologically linked to a confirmed case or to meat known to contain trichinella larvae.
Reporting Requirements and Forms	**Trichinellosis is a notifiable infection in Nunavut**: 1. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later (section 4.15.2). 2. Fax the form, within 7 days of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: o Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 o All other Qikiqtaaluk communities: 867-473-2657
Tools	
Guidelines	Not applicable
Materials & Resources	Fact Sheet: Trichinellosis
Cross Reference	Not applicable
References	

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Trichinosis-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at:

http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Kim Barker, Chief Medical Officer of Health on June 5, 2018.

4.16.1 Typhoid

Special Precautions/Considerations

Precautions: Routine
*Consider Contact precautions for incontinent clients and children under 6.

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Caused by the gram-negative bacillus *Salmonella typhi*, which differs from most other *Salmonella* species in that it infects only humans and frequently causes severe systemic illness.
Clinical	
Clinical Presentation	Characterized by insidious onset of sustained fever, dull frontal headache, malaise, myalgia, non-productive cough, anorexia, nausea and abdominal discomfort. Constipation is more common than diarrhea. The clinical presentation is highly variable, ranging from mild illness with low-grade fever to severe clinical disease with multiple complications.
Diagnostics	*S. typhi* can be isolated from blood early in the disease and from urine and feces after the first week of illness. Blood culture is the diagnostic mainstay. Follow your regional laboratory procedures.
Treatment	Evidence suggests fluoroquinolones are the drug of choice in adults, however resistance has been observed. Consult with an Infectious Disease Specialist for treatment recommendations.
Pathogen	
Occurrence	**Worldwide:** Typhoid occurs worldwide; the estimated annual incidence is about 22 million cases with approximately 200,000 deaths. Most of the burden of illness occurs in the developing world. **Canada:** The incidence of Typhoid is very low in Canada. The greatest risk of typhoid infection for Canadians occurs while travelling to countries where sanitation is likely to be poor and associated with exposures to food and water in uncontrolled settings. (e.g., market stalls, street vendors, family settings). **Nunavut**: There have been no reported cases from 2007–2011.
Reservoir	Humans; household contacts may be transient or permanent carriers. The chronic carrier state is most common among persons infected during middle age, especially women, and they frequently have biliary tract abnormalities including gallstones.
Transmission	Fecal-oral from person to person, or by ingestion of food or water contaminated by feces or urine of the infected person. Consumption of shellfish harvested from beds contaminated by sewage or fruits and vegetables fertilized by human waste and eaten raw.
Incubation Period	From 3 days to over 60 days; usual range is 8-14 days.
Communicability	Usually from the first week of illness throughout convalescence. Two to 5 percent of those infected may become chronic carriers of *S. typhi*. In those treated with appropriate antibiotics, fewer than 2% become carriers or relapse.
Susceptibility and Resistance	Susceptibility is general and is increased in individuals with gastric achlorhydria and possibly in those who are HIV positive. Relative specific immunity follows recovery from clinical disease and inapparent infection. Typhoid vaccines confer partial immunity and may be overwhelmed by a large inoculum of *S. typhi*.

Public Health Management

Case

Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the ***Food and Waterborne Illness Investigation Form*** dated March 2014 or later (section 4.16.2).

Investigate cases of Typhoid to determine the source of infection, being sure to obtain the following disease-specific information:

- History of recent international travel.
- Typhoid immunization status (note vaccination information).
- History of exposure to possible sources (see Transmission section).
- Food and water history in the 14 days prior to symptom onset.

All cases should be instructed about disease transmission, appropriate personal hygiene, routine practices, and contact precautions.

Provide Health Education to case on transmission and prevention of the disease.

Identify close contacts (see Contacts section).

Determine if case is a food handler, a health care provider or staff of a childcare (daycare) facility. Exclusion is at the discretion of the Chief Medical Officer of Health (CMOH)/Deputy CMOH. Consult with the Environmental Health Officer (EHO) regarding exclusion criteria described below:

Risk Group	Criteria for Exclusion
Food Handlers	Exclude until 3 consecutive stool samples are negative. They are to be collected one week apart and at least 24 hrs after cessation of symptoms. If treated, then specimens must be collected at least 2 weeks after completion of antibiotic treatment.
Health care, nursery or other staff who have contact with susceptible persons	Exclude until 3 consecutive stool samples are negative. They are to be collected one week apart and at least 24 hrs after cessation of symptoms. If treated, then specimens must be collected at least 2 weeks after completion of antibiotic treatment.
Children less than 5 years old attending daycare etc	Exclude until 3 consecutive stool samples are negative. They are to be collected one week apart and at least 24 hrs after cessation of symptoms. If treated, then specimens must be collected at least 2 weeks after completion of antibiotic treatment.
Case contacts who are in special risk groups	*Symptomatic:* Exclude and have stool samples cultured for confirmation. If positive, handle as a case. If negative, exclude until symptoms have cleared and stools are well formed. *Asymptomatic:* This must be evaluated on a case by case basis.

	Carriers: If a person remains positive for more than 12 months, they may be considered a chronic carrier. Maintain surveillance of chronic carriers until they are cleared; this requires they submit 3 consecutive negative stool cultures, taken not less than 24 hours apart and at least 48 hours after the termination of any antibiotic therapy. Chronic carriers may submit one culture a month. Discuss with the CMOH/DCMOH.
Contacts	• Consider household members as close contacts of a case. • Provide contacts with information on transmission and prevention of infection. • Symptomatic contacts that work in high risk settings should be assessed by a health care provider to determine if they are infected. • Exclusion is at the discretion of the CMOH/DCMOH as per the criteria above (see Case section).
Outbreaks	If even a single case of Typhoid is detected, contact your EHO.
Health Education	• Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food. • Educate food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products, time-temperature standards, and thorough hand washing. • Advise infected individuals to avoid food preparation. • Educate about the risk of sexual practices that permit fecal-oral contact. • Educate about condom use for safer sex. • Educate about the dangers of consuming raw or unpasteurized milk or other dairy products. • Educate about the dangers of consuming undercooked meat, poultry, and eggs (including foods in which raw eggs are present). • Consult with the healthcare provider regarding Typhoid occurrence and vaccination recommendations. Routine typhoid immunization is not recommended in Canada. However, selective immunization should be considered in the following groups: o Travelers who will have prolonged (more than 4 weeks) exposure to potentially contaminated food and water, especially those travelling to or working in small cities, villages or rural areas in countries with a high incidence of disease. o Travelers with reduced or absent gastric acid secretion. o People with ongoing household or intimate exposure to an *S. typhi* carrier. • Typhoid vaccine does not confer complete protection against disease, and immunity may be overwhelmed by a large inoculum of *S. typhi*. Therefore, it is necessary to warn travelers that immunization is only an additional preventive measure against Typhoid Fever in high-risk situations and that care in the selection of food and water remains of primary importance.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine. Consider Contact precautions for incontinent clients and children under 6.
Occupational Health	Contact precaution for patients with uncontained feces.

Surveillance

Case Definition	**Confirmed Case** Clinical illness (see below) with laboratory confirmation of infection: • Isolation of *Salmonella* Typhi from an appropriate clinical specimen. **Clinical Illness:** Typhoid is characterized by insidious onset of sustained fever, headache, malaise, anorexia, splenomegaly, constipation or diarrhea, and nonproductive cough. Relative bradycardia and rose spots (less than 25% of individuals) may be seen. Atypical presentations occur, and the severity of the illness varies. Chronic carrier state (< 5% of population) is usually linked to the biliary or urinary tract and should be distinguished from short-term fecal carriage.
Reporting Requirements and Forms	**Typhoid is a notifiable infection in Nunavut**: 1. Notify your EHO if during regular business hours, or the Public Health Emergency Contact if after regular business hours at 867-975-5772. 2. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later (section 4.16.2). 3. Fax the form, within 24 hours of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: o Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 o All other Qikiqtaaluk communities: 867-473-2657 4. If you cannot contact your EHO, contact the Territorial Environmental Health Specialist at 867-975-5782.

Tools

Guidelines	Not applicable
Materials & Resources	Not applicable
Cross Reference	Not applicable

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Typhoid-Fever-2013.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Nova Scotia Communicable Diseases Manual. Available online at: http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Public Health Agency of Canada, 2006. Canadian Immunization Guide, Seventh Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-hepa-eng.php

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 18, 2015.

4.17.1 *Escherichia coli* (Verotoxigenic)

Special Precautions/Considerations

Precautions: Routine and Contact if incontinent

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Verotoxigenic *Escherichia coli* (VTEC) comprise a wide range of serotypes that produce a variety of closely related verotoxins, of which *E. coli* O157:H7 is the most commonly associated with infection in humans.
Clinical	
Clinical Presentation	Diarrhea often beginning as non-bloody progressing to visible or occult blood, severe abdominal pain, vomiting; fever is not present in most cases and symptoms usually last fewer than 5 days. Most of those infected recover without residual sequelae; however, illness may be complicated by hemolytic uremic syndrome (HUS), thrombocytopenic purpura (TPP) or pulmonary edema. Asymptomatic infections may also occur and the microorganism may cause extra-intestinal infections.
Diagnostics	The diagnosis is confirmed by isolation of the bacteria from stool, urine or blood. The diagnosis of *E. coli* should be considered in the presence of severe diarrhea, HUS, TTP or hemorrhagic colitis. Follow your regional laboratory procedures.
Treatment	Treatment is supportive; fluid and electrolyte replacement when diarrhea is watery. The role of antibiotics is uncertain, however, some evidence suggests that treatment with TMP-SMX fluoroquinolones may precipitate complications such as HUS.
Pathogen	
Occurrence	**Worldwide:** The diarrheal illness was first recognized in the United States in 1982. Since that time it has become an important concern in North America, Europe, South Africa, Japan, the southern cone of South America, and Australia. The highest age-specific incidence rates occur in children under the age of 15 years, although all age ranges are susceptible. **Canada:** Sporadic cases and outbreaks have occurred in Canada. According to the National Enteric Surveillance Program (NESP), the incidence rates of *E. coli* from 2002 to 2012 show a downward trend. For example, the number of cases of *E. coli* O157 in 2012 was approximately half that reported in 2006. **Nunavut**: There have been no reported cases from 2007–2011.
Reservoir	The most important reservoir is infected dairy and beef cattle, but other animals such as sheep, pigs and goats can also be infected. Humans may serve as a reservoir for person-to-person spread, which can be common in outbreaks.
Transmission	Transmission by the fecal-oral route mainly by ingestion of contaminated food. Ground beef is a common source of infection but other known sources include raw milk, raw milk cheese, fresh produce such as spinach and lettuce, sprouts, melons and unpasteurized apple cider or juices. Waterborne transmission can occur through the ingestion of contaminated drinking or recreational water. Animal-to-person transmission can occur at farms and petting zoos. Person-to-person transmission most frequently occurs in settings where personal hygiene practices are inadequate.

Incubation Period	Two to 10 days with a median incubation period of 3 to 4 days. HUS may develop up to 2 weeks after the onset of diarrhea.
Communicability	Variable, as long as organisms are excreted. The duration of excretion of the pathogen is typically one week or less in adults but can be as long as 3 weeks in one third of children. Prolonged carriage is uncommon.
Susceptibility and Resistance	The infectious dose is very low. Little is known about differences in susceptibility and immunity, but infections occur in persons of all ages. Children under five years of age are most frequently diagnosed with infection and are at greatest risk of developing HUS. The elderly also appear to be at increased risk of complications.

Public Health Management

Case

Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the ***Food and Waterborne Illness Investigation Form*** dated March 2014 or later.

Investigate cases of *E. coli* to determine the source of infection, being sure to obtain the following disease-specific information:

- History of exposure to possible sources (see Transmission section).
- Food and water history in the past 7 days.
- History of recent (international) travel.

Obtain and test suspected food products and remove from consumption to avoid further exposure.

All cases should be instructed about disease transmission, appropriate personal hygiene, routine practices, and contact precautions.

Determine if case is a food handler, a health care provider or staff of a childcare (daycare) facility. Exclusion is at the discretion of the Chief Medical Officer of Health (CMOH)/Deputy CMOH. Consult with the Environmental Health Officer (EHO) regarding exclusion criteria described below:

Risk Group	Criteria for Exclusion
Food Handlers	Exclude until 2 negative stool samples have been obtained at least 24 hrs apart or 48 hrs after the completion of antibiotic therapy and symptoms have cleared.
Health care, nursery or other staff who have contact with susceptible persons	Exclude until 2 negative stool samples have been obtained at least 24 hrs apart or 48 hrs after the completion of antibiotic therapy and symptoms have cleared.
Children less than 5 years old attending daycare etc	Exclude until 2 negative stool samples have been obtained at least 24 hrs apart or 48 hrs after the completion of antibiotic therapy and symptoms have cleared.
Case contacts who are in special risk groups	Symptomatic Exclude and have stool samples cultured for confirmation. If positive, handle as a case. If negative, exclude until symptoms have cleared and stools are well formed. Asymptomatic: This must be evaluated on a case by case basis.

Contacts	• Consider household members as close contacts of a case. • Provide contacts with information on transmission and prevention of infection. • Symptomatic contacts that work in high risk settings should be assessed by a health care provider to determine if they are infected. • Exclusion is at the discretion of the CMOH/DCMOH as per the criteria above (see *Case*).
Outbreaks	If even a single case of *E. coli* is detected, contact the Environmental Health Officer (EHO).
Health Education	• Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food. • Educate food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products, time-temperature standards, and thorough hand washing. • Advise infected individuals to avoid food preparation. • Educate about the risk of sexual practices that permit fecal-oral contact. • Thoroughly cook raw food from animal sources (e.g., beef, pork, and poultry). • Thoroughly wash raw vegetables and fruit before eating. • Keep uncooked meats separate from vegetables, cooked foods, and ready-to-eat foods. • Avoid consumption of unpasteurized milk or foods made from raw milk. • Wash hands, knives, and cutting boards after handling uncooked foods.
Health Settings Management	
Infection Control Measures in Health Care Settings	
Occupational Health	
Surveillance	
Case Definition	**Confirmed Case** Laboratory confirmation of infection with or without clinical illness (see below): • Isolation of verotoxin-producing *Escherichia coli* from an appropriate clinical specimen (e.g., feces, urine, blood) **OR** • Detection of verotoxin antigen or nucleic acid **Clinical Illness:** Clinical illness is characterized by diarrhea (often bloody) and abdominal cramps; fever is often absent. Illness may be complicated by hemolytic uremic syndrome (HUS), thrombocytopenia purpura (TTP) or pulmonary edema. Asymptomatic infections may also occur and the microorganism may cause extra-intestinal infections.
Reporting Requirements and Forms	**Verotoxigenic *E. coli* is a notifiable infection in Nunavut:** 1. Notify your EHO if during regular business hours, or the Public Health Emergency Contact if after regular business hours at 867-975-5772. 2. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later.

	3. Fax the form, within 24 hours of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: o Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 o All other Qikiqtaaluk communities: 867-473-2657 4. If you cannot contact your EHO, contact the Territorial Environmental Health Specialist at 867-975-5782.

Tools

Guidelines	
Materials & Resources	**Fact Sheet: *E. coli***
Cross Reference	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Escherichia-coli-Verotoxigenic-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Nova Scotia Communicable Diseases Manual. Available online at: http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Public Health Agency of Canada. *E. coli*. Available online at: http://www.phac-aspc.gc.ca/fs-sa/fs-fi/ecoli-eng.php

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 9, 2015.

4.18.1 Yersiniosis

Special Precautions/Considerations

Precautions: Routine
*Consider Contact precautions for incontinent clients and children.

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Yersiniosis is caused by a gram-negative bacterium. Two species, *Yersinia enterocolitica* (most common in Canada) and *Yersinia pseudotuberculosis* are the causative agents of Yersiniosis.
Clinical	
Clinical Presentation	Yersiniosis is an acute bacterial enteric disease with a variety of presentations. Enterocolitis occurs in approximately two-thirds of reported cases of *Y. enterocolitica*. Infection is characterized by fever, diarrhea, and abdominal pain lasting 1-3 weeks. Nausea and vomiting occur in up to 40% of cases. Many cases are misdiagnosed as acute appendicitis. The most common manifestation of *Y. pseudotuberculosis* infection is mesenteric adenitis causing acute appendicitis-like syndrome. The infection is usually self-limited. Mesenteric adenitis occurs primarily in older children and young adults. Infection with *Y. pseudotuberculosis* has a higher case-fatality rate in immunocompromised individuals. Complications of infection with *Yersinia* include polyarthritis, erythema nodosum, exudative pharyngitis, and septicemia. Focal infections, abscess formation, and bacteremia may occur in individuals with predisposing conditions. In cases related to blood transfusion, fever and rigors may occur within 30 minutes of the transfusion and may rapidly progress to hypotension, disseminated intravascular coagulation, renal failure, and death.
Diagnostics	*Yersinia* can be recovered from feces, throat swabs, mesenteric lymph nodes, peritoneal fluid, blood, vomit, and contaminated food. Stool cultures are generally positive during the first two weeks of illness. It is important that laboratories be notified that *Yersinia* infection is suspected as identification from stool specimens requires specific techniques. Serology may be utilized as there can be difficulties in isolating *Yersinia* from feces. ELISA and agglutination tests may be ordered. Antibodies appear soon after the onset of illness and wane over 2-6 months. Paired sera specimens taken two weeks apart indicating a rise in agglutinating antibodies can support the diagnosis. Follow your regional laboratory procedures for testing.
Treatment	Treatment is under the direction of the attending healthcare provider. Yersiniosis is often self-limited. Antibiotics may shorten the duration of symptoms and are especially important for septicemia or other invasive disease.
Pathogen	
Occurrence	**Worldwide**: Worldwide occurrence. The highest rates are reported in cooler climates and occur more often in winter than summer. Yersiniosis is a common

	disease in Northern Europe, Scandinavia, and Japan. The majority of cases are related to the ingestion of raw or undercooked pork or pork products. Approximately 65% of *Y. enterocolitica* infections occur in infants and young children. **Canada**: Yersiniosis is an uncommon source of diarrhea and abdominal pain in Canada. The number of cases is unknown as Yersiniosis is not a nationally notifiable disease. **Nunavut**: There have been no reported cases from 2007–2011.
Reservoir	Animals. Pigs are the main reservoir for *Y. enterocolitica*. *Y. pseudotuberculosis* is widespread among avian and mammalian hosts, particularly rodents and other small mammals.
Transmission	Fecal-oral transmission through consumption of contaminated food or water or through contact with infected people or animals. *Y. enterocolitica* infection is most often associated with undercooked meat and pork products. Transfusion with blood from asymptomatic donors is also possible.
Incubation Period	The incubation period is most often 3-7 days, generally less than 10 days.
Communicability	Secondary transmission appears rare. Fecal shedding occurs as long as symptoms persist; usually 2-3 weeks. If untreated, individuals may shed for 2-3 months; prolonged asymptomatic carriage has been reported.
Susceptibility and Resistance	Universal susceptibility. The infection is generally more severe in children. The most susceptible populations for disease and possible complications are the very young, the very old and immunocompromised individuals.

Public Health Management

Case

Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the ***Food and Waterborne Illness Report Form*** dated March 2014 or later (section 4.18.2).

Investigate cases to determine the source of infection, being sure to obtain the following disease-specific information:

- Food and water history (retain all suspected food or water for laboratory analysis based on Environmental Health Officer [EHO] direction).
- History of out of territory or international travel.
- History of similar illness in household members.

Cases should be instructed about disease transmission and prevention.

Exclusion is at the discretion of the Chief Medical Officer of Health (CMOH)/Deputy CMOH. Exclusion may be considered for symptomatic persons; consult with the EHO regarding exclusion criteria described below:

Risk Group	Criteria for Exclusion
Food Handlers	Exclude until asymptomatic for 24 hrs or 48 hrs after completion of antibiotic treatment.
Health care, nursery or other staff who have contact with susceptible persons	Exclude until asymptomatic for 24 hrs or 48 hrs after completion of antibiotic treatment.
Children less than 5 years old attending daycare etc.	Exclude until asymptomatic for 24 hrs or 48 hrs after completion of antibiotic treatment.

	<table><tr><td>Case contacts who are in special risk groups</td><td>*Symptomatic*: Exclude until asymptomatic for 24 hrs or for 48 hrs after completion of antibiotic treatment. *Asymptomatic*: No exclusion required</td></tr></table> Asymptomatic individuals who are indicated in the above categories are generally not excluded from work or daycare however the decision to exclude will be made by the CMOH/DCMOH.
Contacts	• Consider household members as close contacts of a case. • Provide contacts with information on transmission and prevention of infection. • Symptomatic contacts should be assessed by a health care provider to determine if they are infected. • Symptomatic contacts may be excluded from daycare or similar facilities or occupations involving food handling, patient care or care of young, elderly or dependent persons. Exclusion is at the discretion of the CMOH/DCMOH as per the criteria above (see Case section).
Outbreaks	If a higher than normal amount of disease activity is detected, contact your EHO.
Health Education	• Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food. • Educate food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products, time-temperature standards, and thorough hand washing. • Ensure thorough cooking and safe handling of meats, especially pork. • Advise infected individuals to avoid food preparation. • Educate about the risk of sexual practices that permit fecal-oral contact.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine. Consider Contact precautions for incontinent clients and children.
Occupational Health	Not applicable
Surveillance	
Case Definition	**Confirmed case:** • Laboratory confirmation of infection with or without clinical illness: Isolation of *Yersinia enterocolitica* or *Yersinia pseudotuberculosis* from an appropriate clinical specimen (e.g., stool) or food **OR** • Positive *Yersinia* serology by agglutination test or ELISA. **Probable case:** Acute clinical illness in a person who is epidemiologically linked to a confirmed case. **Clinical illness:** Clinical illness typically manifests as acute febrile diarrhea, enterocolitis (fever, diarrhea (with or without blood), severe abdominal pain), or acute mesenteric lymphadenitis mimicking appendicitis. Infection can be complicated by erythema nodosum, postinfectious arthritis, and systemic infection.

Reporting Requirements and Forms	**Yersiniosis is a notifiable infection in Nunavut:** 1. Complete the *Food and Waterborne Illness Investigation Form* dated March 2014 or later (section 4.18.2). 2. Fax the form, within 7 days of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: o Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 o All other Qikiqtaaluk communities: 867-473-2657

Tools

Guidelines	Not applicable
Materials & Resources	Not applicable
Cross Reference	Not applicable

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Yersiniosis-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at: http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 18, 2015.

5.0 Bloodborne Infections

Purpose

The purpose of this section of the Communicable Disease Manual is to provide guidelines for the investigation and management of individuals who have been diagnosed with notifiable bloodborne infections, including Acquired Immunodeficiency Syndrome (AIDS), Hepatitis B, Hepatitis C, Human Immunodeficiency Virus (HIV), Human T-Cell Lymphotropic Virus, as well as exposure to blood and body fluids.

Legislation/Policy

Authority for the reporting of notifiable bloodborne infections and their public health management comes from the *Public Health Act, Communicable Disease Regulations*.

All clients who have been diagnosed with notifiable bloodborne infections must be reported to the Chief Medical Officer of Health (CMOH).

All clients who are suspected to have or have a confirmed notifiable bloodborne infection are to be followed as per the protocols in this section.

Roles and Responsibilities

Table 5.1: Roles and responsibilities for follow up of notifiable bloodborne infections

Role	Responsibilities
Laboratory	• Report all laboratory confirmed notifiable bloodborne infections to the CMOH or designate.
Health Care Provider team (Physician, Nurse Practitioner, Community Health Nurse, Public Health Nurse)	• Test all clients suspected to have a notifiable bloodborne infection. • Treat all clients with a notifiable bloodborne infection. • Complete public health case and contact management (as applicable) of clients with a notifiable bloodborne infection. • Complete the appropriate case report form(s) and send it to the Regional Communicable Disease Coordinator (RCDC).
Regional Communicable Disease Coordinator	• Provide advice on a regional basis for the case and contact management (as applicable) of notifiable bloodborne infections. • Receive and review reports of notifiable bloodborne infections. • Consult with the Territorial Communicable Disease Consultant (TCDC) as required.
Territorial Communicable Disease Consultant	• Provide advice on a territorial basis for the case and contact management (as applicable) of notifiable bloodborne infections. • Ensure cases are included in the communicable disease information system.
Chief or Deputy Chief Medical Officer of Health	• Be available for consultation on notifiable bloodborne infections. • Make program recommendations.

5.1.1 Acquired Immunodeficiency Syndrome and Human Immunodeficiency Virus

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Human immunodeficiency virus (HIV-1 and HIV-2), a retrovirus. HIV-1 is the predominant strain in Canada and worldwide.
Clinical	
Clinical Presentation	80-90% of HIV infected people develop a flu-like illness within 4 to 8 weeks after exposure to the virus. This non-specific flu-like illness may include recurring fever or profuse night sweats, fatigue, arthralgia or myalgia, headaches, malaise, rash, pharyngitis, oral or genital ulcers, weight loss, nausea, vomiting or diarrhea or lymphadenopathy. These symptoms usually disappear within a week to a month and are often mistaken for those of another viral infection. Persons are then asymptomatic for months to years. AIDS is advanced HIV-related disease. This syndrome represents the late clinical stage of HIV infection resulting from progressive damage to the immune system, leading to one or more of many opportunistic infections and cancers (see Case Definition section).
Diagnostics	Serological testing for HIV-1 and HIV-2 is done using a commercial EIA test kit as the initial screening test. All positive EIA test results are confirmed by an HIV-1 Western blot (WB), a specific test. A negative confirmatory HIV WB test negates the initial reactive EIA, and is reported as negative. A positive WB supports the initial reactive EIA, and is reported as positive. An indeterminate WB result cannot be interpreted as either negative or positive and requires repeat and possibly supplementary testing, the latter guided by risk factors for HIV infection. Any unusual results should be discussed with the Chief Medical Officer of Health (CMOH). Occasionally, an individual may be in the window period of HIV infection with a negative EIA, or a negative/indeterminate WB. Rarely, infection with HIV-2 may explain a positive EIA and negative/indeterminate WB. Consultation with the laboratory or infectious diseases specialist is warranted if such clinical scenarios are identified. Detection of HIV nucleic acid (e.g., DNA PCR or Plasma RNA) can facilitate an HIV diagnosis. In infants less than 18 months of age born to HIV-infected mothers, testing should be done within two weeks after birth and, if negative, repeated at 1 to 2 months and at 3 to 4 months of age. All positive results should be repeated with a second specimen for confirmation. Consult with an expert in HIV in children. The “window period” for HIV antibody development in non-immunocompromised hosts is usually less than a month with the current generation of screening tests. However, antibody development may be delayed if the subject is immunocompromised, or is co-infected with Hepatitis C. Follow your regional laboratory procedures for serologic testing.
Treatment	Consult with a specialist for the latest and most appropriate treatment recommendations.

Pathogen	
Occurrence	**Worldwide:** AIDS was first recognized in 1981; and has been documented in virtually all countries of the world, among all races, ages, and social classes. **Canada:** AIDS in Canada was first recognized in the early 1980s, and testing programs became available in 1985. The distribution of HIV cases by exposure category and sex has changed over the years. When HIV reporting began in 1985, men having sex with men (MSM) accounted for over 80% of all positive test reports. This percentage has diminished significantly since that time. The proportion of new infections among heterosexuals, injection drug users (IDUs) and women has increased steadily over the last two decades. Aboriginal persons (including Inuit, Métis and First Nations) are over-represented among the total of new HIV cases. **Nunavut:** There have been 2 reported cases in Nunavut since 1999.
Reservoir	Humans.
Transmission	The HIV virus, which leads to AIDS, is transmitted from person to person. Possible routes of transmission include: • Sexual contact with an HIV infected person; • Contact of abraded skin or mucosa with body secretions such as blood, CSF or semen; • Percutaneous exposure to an HIV contaminated implement (injection drug use paraphernalia, needle stick puncture, razors, body modification, etc); • Perinatal transmission from an HIV infected mother; • Transfusion, transplantation or ingestion of HIV contaminated blood, blood products, cells, organs, tissues or breast milk. The presence of a concurrent sexually transmitted infection, especially an ulcerative one, can facilitate HIV transmission. While HIV has occasionally been found in saliva, tears, urine and bronchial secretions, transmission after contact with these secretions has not been reported.
Incubation Period	Variable; antibodies can typically be detected in the blood 3 to 6 weeks from initial infection (usually 1 to 3 months). The time from HIV infection to diagnosis of AIDS has an observed range of less than one year to 15 years or longer.
Communicability	Epidemiological evidence suggests that transmissibility begins early after the onset of HIV infection and extends throughout life. Infectiousness is highest during the initial infection, and rises with increasing immune deficiency. The presence of other Sexually Transmitted Infections (STIs), especially ulcerative STIs increases the likelihood of transmission.
Susceptibility and Resistance	Susceptibility is presumed to be general. Absence of male circumcision and the presence of STI, especially those with ulcerations, increases susceptibility to HIV. Individuals who are co-infected with *M. tuberculosis* and HIV develop active TB at an increased rate, especially as individuals become immunocompromised due to HIV.

Public Health Management	
Case	• Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. • Contact the RCDC, who may require your assistance obtaining case information to complete the Case Report Form. • Educate the case about the modes of transmission and reducing the risk of transmission to others, including informing the case about the duty to disclose status to sexual and/or drug partners (IDU and non-IDU partners). • Identify contacts (see Contacts section). • Assess the risks associated with other STIs, hepatitis B and hepatitis C. • Initiate immediate follow-up of all pregnant women. • Screen for TB based on Nunavut procedures. • Encourage regular follow-up with a physician experienced in HIV/AIDS care and treatment. • If the client's positive HIV status has been reported previously and appropriate follow-up was done at that time, confirm that potential partners have been informed by the case of his/her HIV status and that appropriate protective measures continue to be used. • Offer vaccination as recommended in the current Nunavut Immunization Manual as this group is at higher risk of either acquiring disease or of invasive disease, including pneumococcal, hepatitis B series (if non-immune), and an annual influenza vaccination. • Screen for concurrent STIs (e.g., chlamydia, gonorrhea and syphilis).
Contacts	• All HIV-positive individuals are assumed to be infectious and capable of transmitting the virus through exchange of blood and body fluids. They must, therefore, be interviewed to identify and disclose names of their sexual and needle-sharing contacts. • Contact notification and follow-up of drug sharing and sexual contacts must be undertaken on all reported cases of HIV infection and AIDS. • Tracing of contacts should be based on the estimated duration of infection. If the date of seroconversion is known, all contacts in the six months prior to the positive testing should be identified. If the seroconversion date is unknown, all contacts, as far back as practical, should be identified. • It is recommended to meet with the contact in person. • Contacts should be provided with information that includes: modes of transmission, disease process, how to modify risk behaviors, telephone numbers and addresses of support agencies and testing clinics. • All contacts should be encouraged to be tested for HIV and other STIs. Contacts should be given specific details on where to be tested, and how it will be reported if positive. • Complete the *Blood and Body Fluid (BBF) Contact Investigation Form,* dated October 2012 or later (section 5.1.2). **Pregnant women** • If the contact is a pregnant woman, in addition to standard HIV testing, a HIV specialist should be consulted regarding additional tests (e.g., HIV RNA) and/or further HIV antibody testing. If the contact is found to be HIV positive, immediate referral should be made to a HIV specialist. - One negative HIV antibody test may be inadequate due to the possibility of being in the "window period", or having ongoing risk behaviour. Therefore, based on continued risk behaviour, it is

	recommended that additional testing be performed during pregnancy and/or prior to delivery. - If the woman does not return for retesting, public health personnel and/or the health care provider should make attempts to contact her and provide additional information and/or support. **Infants** • Children born to HIV-positive women should be referred to a specialist in pediatric infectious diseases for assessment as soon as possible after delivery. • For infants born to HIV-positive mothers who have not taken antiretroviral prophylaxis, perinatal transmission can be reduced by starting antiretroviral therapy as soon as possible after birth, preferably within one to four hours. A specialist in pediatric infectious diseases should be consulted in all cases. • HIV-positive mothers should not breastfeed. **Other Contacts** • Individuals exposed to blood and other body fluids capable of producing HIV infection, such as occupational health exposure, should be notified of potential HIV exposure, and should be assessed for chemoprophylaxis. See Blood Borne Pathogen Exposure Guidelines in this manual (section 5.2.1).
Outbreaks	If a single case of HIV/AIDS is suspected, contact your RCDC.
Health Education	• Prevention and public health programs should be offered to reduce HIV transmission through IDU (e.g., needle exchange programs and harm reduction strategies). • Confidential HIV testing should be made available in facilities where HIV is common (i.e., correctional facilities, TB clinics, drug treatment centers, family planning and prenatal clinics, STI clinics, establishments that offer services to MSM, homeless shelters, and group homes). • Health care providers should recommend to all STI cases and contacts that they be tested for HIV. • HIV testing is recommended in all pregnant women. All pregnant women should be counseled regarding HIV testing and prenatal blood work should include HIV screening unless the woman opts out. Those found to be positive should be advised of the recommendation for prophylactic antiretroviral medications for herself and the baby. • Provide public education about the safe handling of blood, body fluids, and sharps disposal. • Focus on methods to reduce high risk sexual behaviors that may lead to HIV or STIs (e.g., safer sex education). • School health programs should centre on basic and accurate information about STIs, safer sex and HIV/AIDS. • Provide territorially-funded hepatitis B vaccine for those at increased risk of infection due to risk factors common to HIV infection. • Anyone considering tattooing, body piercing, or acupuncture should be counselled to ensure that these practices are carried out with sterile equipment, preferably single-use equipment.

Health Settings Management	
Infection Control Measures in Health Care Settings	Routine
Occupational Health	Immediate medical assessment and treatment after needlestick or significant blood and body fluid exposure. Assess for HIV prophylaxis. Consider post exposure prophylaxis if high risk exposure. See Blood Borne Pathogen Exposure Guidelines in this manual (section 5.2.1).
Surveillance	
Case Definition	**HIV - Confirmed Case** Adults, Adolescents and Children ≥ 18 months: • Detection of Human Immunodeficiency Virus (HIV) antibody with confirmation (e.g., EIA screening with confirmation by Western blot or other confirmatory test) **OR** • Detection of HIV nucleic acid (e.g., DNA-PCR or plasma RNA) **OR** • Detection of HIV p24 antigen with confirmation by neutralization assay **OR** • Isolation of HIV in culture. Children < 18 months: (on two separate samples) (1) • Detection of HIV nucleic acid (e.g., DNA-PCR or plasma RNA) **OR** • Detection of HIV p24 antigen with confirmation by neutralization assay **OR** • Isolation of HIV in culture. (1) In children < 18 months of age born to HIV positive mothers, nucleic acid testing should be done within two weeks after birth and if negative repeated at 1 to 2 months and at 3 to 4 months of age. All positive results should be repeated with a second specimen for confirmation. **AIDS - Confirmed Case** • One or more of the specified indicator diseases [2] **AND** • Meeting the case definition for HIV infection. (2) **Indicator diseases for adult and pediatric cases:** • Bacterial pneumonia (recurrent)* • Candidiasis (bronchi, trachea or lungs) • Candidiasis (esophageal)* • Cervical cancer (invasive) • Coccidioidomycosis (disseminated or extrapulmonary) • Cryptococcosis (extrapulmonary) • Cryptosporidiosis chronic intestinal (> 1 month duration) • Cytomegalovirus diseases (other than in liver, spleen or nodes) • Cytomegalovirus retinitis (with loss of vision)* • Encephalopathy, HIV-related (dementia) • Herpes simplex: chronic ulcer(s) (> 1 month duration) or bronchitis,

	pneumonitis or esophagitis • Histoplasmosis (disseminated or extrapulmonary) • Isosporiasis, chronic intestinal (> 1 month duration) • Kaposi's sarcoma* • Lymphoma, Burkitt's (or equivalent term) • Lymphoma, immunoblastic (or equivalent term) • Lymphoma (primary in brain) • Mycobacterium avium complex or M. kansasii (disseminated or extrapulmonary)* • Mycobacterium of other species or unidentified species* • M. tuberculosis (disseminated or extrapulmonary) • M. tuberculosis (pulmonary)* • Pneumocystis jirovecii (formerly Pneumocystis carinii) pneumonia (PCP)* • Progressive multifocal leukoencephalopathy • Salmonella septicemia (recurrent) • Toxoplasmosis of brain* • Wasting syndrome due to HIV **Indicator diseases that apply only to pediatric cases (< 15 years old):** • Bacterial infections (multiple or recurrent, excluding recurrent bacterial pneumonia) • Lymphoid interstitial pneumonia and/or pulmonary lymphoid hyperplasia* * These conditions may be diagnosed presumptively; otherwise, definitive diagnosis is required.
Reporting Requirements and Forms	**HIV/AIDS are reportable infections in Nunavut:** Notify your RCDC if during regular business hours, or the MOH on call if after regular business hours. The RCDC can contact the Office of the CMOH to obtain the appropriate HIV/AIDS Case Report Form.

Tools

Guidelines	
Materials & Resources	

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Human-Immunodeficiency-Virus-2011.pdf and http://www.health.alberta.ca/documents/Guidelines-Acquired-Immunodeficiency-Syndrome-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on April 9, 2014.

5.2 Protocol for the Management of Exposures to Blood and Body Fluids

Form: Exposure to Blood and Body Fluids Case Report & Worksheet for Consultation

5.2.1 Purpose

To provide a guideline for the investigation and management of individuals who have occupational or accidental percutaneous or mucosal exposure to blood or body fluids from a person who may have Hepatitis B (HBV), Hepatitis C (HCV) or Human Immunodeficiency Virus (HIV).

2.0 Policy

Any health care worker (HCW) having significant exposure to human blood or body fluids shall report the incident to their immediate supervisor who will arrange a clinical assessment and follow-up and ensure an incident report is filed.

A community client reporting direct exposure to human blood and body fluids should have a clinical assessment and follow-up using this protocol.

Exposed HCWs and community clients are hereafter referred to as *the Exposed.*

The Regional Communicable Disease Coordinator (RCDC) is available for consultation as required. The RCDC will consult with the Territorial Communicable Disease Consultant and Medical Officer of Health (MOH). After hours the MOH on call can be contacted.

3.0 Roles and Responsibilities

Note: If the exposure is work-related, the Workers' Safety and Compensation Commission (WSCC) must be involved. Please refer to Appendix A in addition to the guidelines below.

Table 1: Roles and responsibilities for exposure to blood borne pathogens

Role	Responsibilities
Primary Health Care Provider i.e. Community health nurse (CHN) or Nurse practitioner (NP) or Physician	• Treat the wound/exposure site as needed • Counsel the *Exposed* regarding risks • Order initial laboratory tests for the *Exposed* • Facilitate the ordering of laboratory test for the *Source* (if known) • Facilitate access to any recommended prophylaxis • Initial reporting to WSCC if the exposure is work related • Consult with the RCDC as necessary
Occupational Health Practitioner or Supervisor of Community Health Programs (SCHP) where there is no occupational health practitioner	• Receive reports of exposed HCWs or other individuals to blood and body fluids • Investigate and manage the exposure from the time of the incident until the file is closed (up to 6 months) as per these guidelines including: o Counseling the Exposed o Ordering blood tests as appropriate and o Administering vaccines as indicated • Review the incident from an occupational health viewpoint and act to prevent recurrence • If work related, complete the initial Workers' Safety and Compensation Commission (WSCC) reporting form (refer to

	Appendix A) • Recommend that follow up is done as per this protocol
Supervisor (applicable only if the exposure is work related)	• Ensure HCW is assessed and counselled • Ensure appropriate incident reports are completed • Review incident and take steps to prevent recurrence
Regional Communicable Disease Coordinator	• Be available for consultation on a regional basis for the investigation and management of blood and body fluid exposures including recommended immunizations • Consult with MOH as required
Territorial Communicable Disease Consultant	• Provide advice on a territorial basis for the investigation and management of blood and body fluid exposures including recommended immunizations
Chief or Deputy Chief Medical Officer of Health	• Provide consultation on exposure to blood and body fluids on a 24/7 basis

4.0 Protocol for the Management of Exposure to Blood and Body Fluid Exposures (Step by Step Guidance)

Follow the steps outlined below regarding the *Exposed* to determine the risk of transmission of a blood borne pathogen and to manage the exposure accordingly.

Consult with the RCDC or MOH as required.

Note: Use *Nunavut Exposure to Blood and Body Fluids Case Report & Worksheet for Consultation* to document the risk assessment and management (see Appendix D). Send this form to the RCDC for consultation when required. If the exposure is work-related fill in the appropriate WSCC form as required (http://www.wcb.nt.ca/Workers/Forms/Pages/default.aspx).

Step 1: Treat the exposed area immediately

- Allow immediate bleeding of the wound
- Wash with soap and water any wounds or skin sites that have been in contact with blood or body fluids
- Flush exposed eyes or mucous membranes with copious amounts of water or normal saline
- Check Td and Hepatitis B vaccine status*

* Tetanus is not bloodborne but consider every blood and body fluid exposure as an opportunity to update tetanus immunization as per the schedule in the Nunavut Immunization Manual

Step 2: Assess the risk by answering the questions below:

Take the following points into account when assessing the risk:

- A significant exposure is when one person's blood or other high risk body fluid comes in contact with someone else's blood, through exposure to subcutaneous tissue, non-intact chapped or abraded skin or mucous membrane
- The risk varies by pathogen and site of exposure

Table 2: Risk of Acquiring infection from an infected source

	Risk of acquiring from percutaneous exposure when source is infected	Risk of acquiring from mucosal exposure	Comments
HBV	Ranges from 23% (HBeAg negative *Source*) to 62% (HBeAg positive *Source*).		HBV can live for one week in dried blood[1]
HCV	The average risk is 1.8%.	Rarely from mucous membrane exposures to blood	No transmission has been documented from intact or non-intact skin exposures to blood. Data are limited on the survival of HCV in the environment, however environmental contamination with HCV infected blood is not believed to be a significant risk for transmission[1]
HIV	Average risk is 0.3% [1]	Average risk is 0.1% [1]	

a) What is the nature of the injury?

The mechanism or route of injury may include:

- Parenteral injection (needle-stick or cut with potentially contaminated sharps)
- Splash to mucous membrane of eyes, nose or mouth
- Non-intact skin exposure
- Human bites resulting in blood exposure to either person involved (both the *Source* and the *Exposed* are considered to be at risk)

Note: Exposure on intact skin does **not** pose a risk for infection with a blood borne pathogen.

b) What type of body fluid was involved?

Body fluids at risk of transmitting HBV, HCV, and HIV from an infected individual in a community setting or health care facility are outlined in Table 3.

Table 3: Transmission of HBV, HCV and HIV by select body fluids and tissues

Fluid/tissue	HBV	HCV	HIV
Blood and fluids visibly contaminated with blood	Yes	Yes	Yes
Semen	Yes	Rare	Yes
Vaginal secretions	Yes	Rare	Yes
Pleural, amniotic, pericardial, synovial and cerebrospinal fluids and inflammatory exudates	Yes	Yes	Yes
Saliva	Yes	If contaminated with blood	If contaminated with blood
Transplanted tissues or organs	Yes	Yes	Yes
Breast milk	Plausible, particularly if nipples are cracked or bleeding	Plausible, particularly if nipples are cracked or bleeding	Yes
Feces, nasal secretions, sputum, sweat, tears, urine, vomitus	No, unless visibly contaminated with blood	No, unless visibly contaminated with blood	No, unless visibly contaminated with blood

c) **Is the infectious status of the source person known (hereafter referred to as the *Source*)?**

- Is the Source infected with HBV, HCV or HIV?
- If the status of the source is unknown, is there increased risk of transmission from the *Source* to the *Exposed*? Increased risk includes
    - high-risk sexual behavior
    - injection drug use
    - diagnosis of other sexually transmitted disease(s)
    - blood contact with a known case of HIV infection
    - emigration from an HBV, HCV, and/or HIV-endemic country
    - tattoo, body piercing, electrolysis, acupuncture
    - history of dialysis
    - history of multiple blood transfusions of blood or blood products prior to January 1972
    - history of receipt of blood-derived coagulation products before January 1972
    - history of receipt of IV immunoglobulin products prior to 1997
- The risk from a found sharp depends on the circumstances

d) **Is the *Exposed* susceptible ?**

- Is the *Exposed* already infected with HBV, HCV or HIV?
- Has the *Exposed* been immunized against HBV? If yes, is their immune (anti-HBs) status known?

Step 3: Order testing for the *Exposed* or the *Source* (if known) based on the answers to the questions in Step 2.

Testing to be done, unless already known to be positive

Disease	Source tests required	Exposed tests required
HBV	HbsAg Anti-Hbs,	HbsAg Anti-Hbs,
HCV	Anti-HCV	Anti-HCV
HIV	HIV	HIV

Note that:

- Testing is **voluntary** for both the *Exposed* and the *Source*
- Test results may not be available quickly. Decisions will have to be made on clinical judgment in the meantime
- Pre-test counseling must be done for both the *Exposed* and the *Source*
- If the *Exposed* refuses to be tested, testing of the *Source* is usually not done
- If the *Source* refuses testing proceed with testing the *Exposed*
- Request consent from the *Source* to make the results known to both the *Exposed* and their health care provider. Document the consent

Step 4: Manage the exposure based on the risk assessment

Note: Hepatitis B vaccine is available in every Community Health Center. Hepatitis B immune globulin (HBIg) is available from the regional laboratory as it is a blood product.

Management of the exposure is based on the immunization and antibody status of the *Exposed* as well as the status of the *Source*.

Note that if the *Source* status is unknown, review the information known about the *Source* and the local epidemiology to assess if the *Source* is considered high risk or low risk for HBV infection.

Hepatitis B (HBV) only

a) *Source* is HBsAg positive or high risk

Source is HBsAg positive or high risk and the *Exposed* is either vaccinated or unvaccinated, see Canadian Immunization Guide; Part IV, Active Vaccines, Hepatitis B Vaccine, Recommendations for use, Post exposure immunization.

***b)* *Source* is HBAg negative or low risk**

Source is uninfected or at low risk, see Canadian Immunization Guide; Part IV, Active Vaccines, Hepatitis B Vaccine, Recommendations for use Post exposure immunization.

Refer to the Nunavut Immunization Manual for details on Hepatitis B vaccine and Hepatitis B Immuneglobulin.

c) Hepatitis C (HCV)

Effective post exposure prophylaxis for HCV is **not available** and immunoglobulin is **not effective**.

d) HIV

The Department of Health in Nunavut has an arrangement with the BC Centre for Excellence in HIV/AIDS whereby a physician or community nurse can call the Centre on a 24/7 basis to get expert advice on the risk of HIV from a blood or body fluid exposure including on the use of anti-retrovirals for post-exposure prophylaxis (PEP) to assist with urgent decisions regarding use of PEP.

- The number to call is 1-604-806-8429
- Each Community Health Centre and Hospital in Nunavut has antiretroviral drugs that are consistent with the recommendations from the BC Centre for Excellence in HIV/AIDS

HIV PEP should be initiated preferably within 2 hours of exposure for maximal efficacy. However, implementation of PEP for up to 72 hours post exposure can be considered.

BC Centre for Excellence in HIV/AIDS
1-604-806-8429

Step 5: Counsel the *Exposed* about follow up testing and precautions

- Provide assurance that all test results will be treated in a strictly confidential manner
- Advise the *Exposed* about the need for medical follow-up for the next six months as per the following Table and depending on their current testing results.

Time interval	Test
6 weeks	HCV and HIV
3 months	HCV and HIV
6 months	HCV HIV and HBV

- Counsel the *Exposed* regarding the risks of infection after an exposure (refer to Step 2)
- Depending on initial tests results, advise the following:
    - Use condoms with lubricant and/or dental dams with their partner(s) every time
    - Delay pregnancy, or if pregnant at time of exposure consult a physician about the need for prophylactic therapies
    - Consult regarding breastfeeding. The risk of transmission of HIV through breastfeeding is high for women who seroconvert while breastfeeding
    - Do not donate blood, cells or tissues
    - Do not share razors, toothbrushes or other personal care items that have the potential to be contaminated with blood or body fluids
    - Do not share needles or injection drug use equipment
    - Seek medical evaluation for any acute illness occurring during the post-exposure follow-up period

5.0 Resources:

Antiretroviral drugs fact sheet
Hepatitis B immunoglobulin fact sheet
Nunavut Immunization Manual
Fact sheets for Health Care and Emergency Service Providers on Occupational Exposures to HIV, Hepatitis B and C are available at http://www.bccdc.ca/NR/rdonlyres/B7631FFB-5F11-493C-9664-ED14010A4456/0/HBV_Occupational_Exposure.pdf

6.0 References:

1. Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Post-exposure Prophylaxis. MMWR (2001). Volume 50; Number RR-11.
2. Therapeutic Guidelines: Accidental Exposure Guidelines (February 2009). British Columbia Centre for Excellence in HIV/AIDS.
3. Nova Scotia Communicable Diseases Manual
4. Canadian Immunization Guide

Appendix A

Workers' Safety and Compensation Commission (WSCC)

In all blood and body fluid exposures, the *Exposed* needs to be seen by a health care provider as soon as possible. This is essential to assess the nature of the exposure and to make decisions about the administration of prophylactic treatment.

There are several important points to note if the exposure is work related:

1. The health care provider needs to complete the form entitled "WSCC: First Medical Reporting Form".
2. The *Exposed* needs to complete the form entitled "WSCC Claim: Workers Report of Injury".
3. The occupational health practitioner or supervisor needs to ensure that the "WSCC Claim: Workers Report of Injury" form is completed. WSCC must receive this form within 72 hours of the incident.
4. The occupational health practitioner or supervisor must ensure that copies of the initial and follow-up serology for the *Exposed* are sent to WSCC at the time that results become available. Follow-up serology is conducted at 3 and 6 months post-exposure.
5. Note that if the serology results are not received by WSCC at the time of the incident (within 72 hours), and at 3 months and 6 months post-exposure, the claim will be closed.

These forms should be available in all health facilities in Nunavut. They are also available at the WSCC website at: http://www.wcb.nt.ca/Workers/Forms/Pages/default.aspx.

Appendix B

PATIENT INFORMATION on Antiretrovirals for HIV Prophylaxis

You have been given these medications because you may have possibly been exposed to HIV. This package contains tenofovir (Viread®), lamivudine (3TC®) and lopinavir/ritonavir (Kaletra®). The combination of these three medications is used for the prevention of HIV transmission.

Start these medications as soon as you receive them.

HOW TO TAKE THE MEDICATIONS
Follow the directions that have been provided to you by your nurse or physician.

Adults:	Tenofovir (Viread®)	Take 1 tablet (300 mg) once daily with food for 28 days
	Lamivudine (3TC®)	Take 1 tablet (150 mg) twice daily with food for 28 days
	Kaletra®	Take 2 tablets twice daily with food for 28 days

- **Tenofovir**
  - is generally well tolerated
  - occasionally, patients may experience nausea, diarrhea and gas
  - rarely, patients have had liver or kidney changes.

- **Lamivudine**
  - is generally well tolerated
  - rarely, patients may have numbness or tingling in hands or feet, but this is very unlikely to occur with one month of therapy.

- **Kaletra**®
  - is associated with nausea, diarrhea, loss of appetite and rash
  - Kaletra® may interact with a number of other medications. **Contact the Health Centre before taking any other prescription or over the counter medications with Kaletra®.**

If you miss a dose, take it as soon as you remember. However, if it is close to the time of your next dose, skip the dose and resume your regular schedule. Do not double your next dose because this may cause side effects.
Store medication in a cool, dry place out of the reach of children. Do not refrigerate them.

These medications may cause changes in the production of blood cells and in liver and kidney function tests. It is important to complete any blood work recommended by the nurse or doctor.

If you have any problems with the medication, contact your Health Centre.*Prepared by; Department of Pharmacy, Qikiqtani General HospitaSpecial thanks to the BC Centre for Excellence in HIV/AIDS for sharing the above information.*

Appendix C

Post-Exposure Surveillance Record for High Risk Community Clients

Hepatitis B Intervention	Test	Date	Result
Initial blood work at the time of injury	HBsAg		
	Anti-HBs		
Test I to 6 months post vaccination if given HBV vaccine and at ongoing risk of exposure	Anti-HBs		

Hepatitis C Intervention	Test	Date	Result
Initial blood work at time of injury	Anti-HCV		
Repeat blood work at 6 weeks if previous result negative	Anti-HCV		
Repeat blood work at 3 months if previous result negative	Anti-HCV		
Repeat blood work at 6 months if previous result negative	Anti-HCV		

HIV Intervention	Test	Date	Result
Initial blood work at time of injury	Anti-HIV		
If on PEP record start date			
Repeat blood work 2 weeks after starting PEP	Anti-HIV		
Repeat blood work 1 month after starting PEP	Anti-HIV		
Repeat blood work at 6 weeks if previous result negative	Anti-HIV		
Repeat blood work at 3 months if previous result negative	Anti-HIV		
Repeat blood work at 6 months if previous result negative	Anti-HIV		

5.3.1 Hepatitis B

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Hepatitis B virus (HBV), a DNA virus. HBV is currently classified into 8 main genotypes (A-H).
Clinical	
Clinical Presentation	Acute HBV infection is often not clinically apparent, with 50-70% of adult cases being asymptomatic. Less than 10% of children and 30%-50% of adults with acute hepatitis B Virus infection show icteric disease. The onset of symptoms is usually gradual and subtle. Symptoms may include anorexia, fatigue, vague abdominal discomfort, nausea and vomiting, sometimes joint pain and rash often progressing to jaundice. Fever may be absent or mild. Severity ranges from asymptomatic cases detectable only by biochemical tests to fulminating cases of acute hepatic necrosis (rare). Chronic infection is characterized by persistence of HBsAG for more than 6 months. Persons with chronic HBV infection may have intermittent flares with symptoms and signs similar to those seen in acute infection. Patients with chronic HBV can progress to cirrhosis, liver failure, and hepatocellular carcinoma.
Diagnostics	Follow your regional laboratory procedures for serologic testing. Interpretation of HBV serology is presented in Table 1. Consult with RCDC or Physician for interpretation of test results.

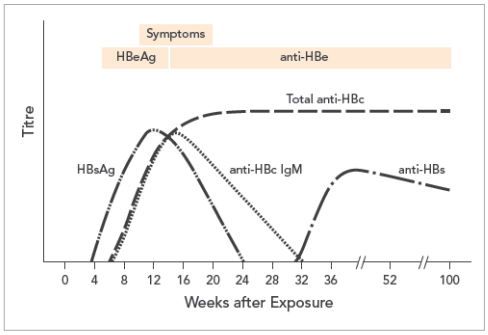
Table 1: Serologic markers for HBV

Interpretation	HBsAg	Anti-HBs	Anti-HBc (total)	Anti-HBc IgM
Acute infection	+	-	+	+
Chronic infection	+	-	+	-
Susceptible to infection	-	-	-	N/A
Immune due to vaccination	-	+*	-	N/A
Immune due to previous infection	-	+*	+	N/A

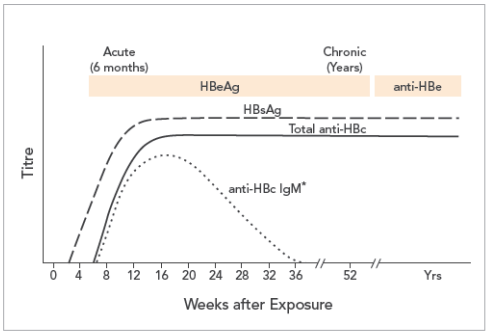
*In some patients, anti-HBs may decline over time and become undetectable.

Overview of serological markers for acute and chronic HBV (Public Health Agency of Canada, Primary care management of Hepatitis B – Quick reference, March 2013)

Acute HBV with recovery



Chronic HBV



* May reappear during flares of activity

Treatment	Any patient with Hepatitis B (acute or chronic) should be referred to a physician for further management.
Pathogen	
Occurrence	**Worldwide**: Endemic with little seasonal variation. In highly endemic countries, most infections occur during infancy and early childhood. In low endemic countries infections occur mostly in young adults, especially those belonging to known risk groups (eg. persons using injection drugs, people who have multiple sex partners, men who have sex with men, household and sexual contacts of people with chronic HBV infection, health care workers and others who may be exposed to blood and blood products through their work, people interned in correctional facilities). **Canada:** Prior to donor screening, blood and blood products were sources of infection in Canada and may still be in countries where the quality of the blood supply is questionable. Outbreaks have previously occurred linked to contaminated or inadequately sterilized needles and syringes; tattoo parlours and acupuncturists; transmission from infected health care workers; and in dialysis centres where infection control practices have not been adhered to. Incidence of acute HBV in Canada is estimated to be 2.3 per 100,000. **Nunavut:** In a serologic study conducted between 1983 and 1985 that screened approximately 51% of the Inuit population of the Northwest Territories (prior to the creation of Nunavut), the overall prevalence rates for HBsAg and anti-HBs were 3.9% and 24.5%, respectively. New HBV infection is believed to be uncommon in Nunavut with the introduction of universal immunization, but accurate epidemiologic data are unavailable.
Reservoir	Humans.
Transmission	Via blood, blood products, saliva, CSF, pleural, peritoneal, semen and vaginal secretions and any other fluid containing blood. Routes of transmission include: • Percutaneous (needle stick or injection drug use when equipment is shared); • Sexual (anal, vaginal, oral); • Close household contact with an infected person; • Perinatal mother-to-infant transmission. HBV is stable on environmental surfaces in blood for at least 7 days making indirect transmission from objects contaminated with infected blood possible.
Incubation Period	45 to 160 days, average 120 days. It may be as short as 2 weeks to the appearance of HBsAg and rarely as long as 6-9 months. The variation is related in part to the amount of virus in the inoculum, the mode of transmission and host factors.
Communicability	From several weeks before onset of first symptoms until infection is resolved. However, 5 to 10% of infected adults go on to carry the virus for life. Chronic infection occurs in 90% of infants infected at birth and 25 to 50% of children infected at age 1 to 5 years. Carriers are capable of transmitting the virus at any time.
Susceptibility and Resistance	All non-immune people are susceptible; disease presentation is usually milder in children and may be asymptomatic in infants. Protective immunity follows infection if anti-HBs develops and HBsAg is negative.

Public Health Management

Case	All laboratory reports of HBsAg positive individuals should be followed up unless the individual is a known carrier who has previously been managed. • Review the patient's chart to determine if the individual has been previously reported • If no indication of previous positive result or no information is available, consult with the Regional Communicable Disease Coordinator (RCDC) who will check the Hepatitis B carrier list. • If not a known carrier, retest in 6 months to determine carrier status. Contact and interview the case. • Interview the case for history of exposure, risk assessment, sexual partners and/or perinatal contact(s). • Complete the *Hepatitis B Report Form* (dated July 2014 or later), including information pertaining to the donation or receipt of blood or tissue. • If the individual has previously donated or received blood cells or tissues, report to the RCDC, who will consult with the Chief Medical Officer of Health (CMOH)/Deputy CMOH to decide on the need for lookback/traceback. • Note on the problem record section of the chart if the person is a known HBV carrier. Consider other communicable infections: • Any patient with HBV infection should be considered to be at risk for other bloodborne pathogens and offered testing for the HCV and HIV. They should also be tested for immunity to Hepatitis A. Educate the case as per the Health Education section of this protocol.
Contacts	Partner notification/contact tracing is essential to identify those at risk of acquiring HBV, both to clarify their immune status and to provide vaccine protection to the non-immune. Contacts include the following: • Those living in the household of an acute case or chronic carrier of HBV; • Sexual contacts of an acute case or chronic carrier of HBV. • Persons who share personal care items such as razors or toothbrushes, or needle sharing partners; • Persons exposed to infected blood or body fluids; • Infants born to mothers with acute and chronic HBV infection who did not receive HBIG and vaccine at birth. **For each contact:** • Ascertain hepatitis B vaccination status and/or whether anti-HBs level has been previously determined; • Test for HBsAg and anti-HBs if status is unknown. • Co-ordinate provision of hepatitis B vaccine and HBIg as required to all contacts; • If immunoprophylaxis is required, refer to the Nunavut Immunization Manual hepatitis B immunoprophylaxis section; • Complete the *Bloodborne Infections Contact Investigation Form* (dated July 2014 or later).

	Household contacts • Provide HBV vaccine to all non-immune and non-infected household contacts of acute cases and chronic carriers; • Test for antibody response 1 to 6 months after completion of the vaccine series. • Non-responders should be offered a second vaccine series. **Contacts who share personal care items such as razors or toothbrushes, or needle sharing partners** • Manage as per percutaneous exposure. See Blood and Body Fluid Exposure (section 5.2). **Sexual contacts of chronic carrier** • Provide HBV vaccine to all non-immune and non-infected sexual contacts of chronic carriers; • Test for antibody response 1 to 6 months after completion of the vaccine series. **Sexual Contacts of an acute case** • Provide HBV testing and vaccine as per contacts of chronic carriers. • Sexual contacts should also receive a single IM dose of HBIg (0.06 mL/kg) within 48 hours after exposure. The efficacy of HBIg decreases significantly after 48 hours, but may be given up to 14 days after exposure from the last sexual contact, due to a lower level of exposure. **Infants born to mothers who are known to be HBsAg positive at time of birth:** • Give a dose of HBV vaccine within 12 hours of birth • In addition, give an IM dose of HBIg as soon as possible and preferably within 12 hours after birth. • Test the infant for HBsAg and anti-Hbs 4 weeks after completion of the HBV vaccine series to determine failed or inadequate immunization. If HBsAg present, the child will likely become chronic carrier. If the infant remains negative for both HBsAg and anti-HBs (i.e. a vaccine non-responder), additional doses of vaccine (up to a second full course) should be given with repeated serologic testing for antibody response.
Outbreaks	If a higher than normal amount of disease activity is detected, contact your RCDC.
Health Education	**Educate the case about the following:** • Range of clinical presentation from asymptomatic to very ill; • Period of communicability; • Long-term prognosis and concept of carrier status. 5 to 10% of HBV-infected adults become carriers, and 10 to 20% of carriers may develop problems later in life with cirrhosis or liver cancer. Reassure and support clients when discussing long-term prognosis; • Need for long-term monitoring including serologic testing and routine imaging; • Perinatal transmission and the importance of identifying any contacts that may be pregnant. Children have a much greater chance of becoming carriers; • Encourage hepatitis A vaccination, which is publicly funded for non-immune individuals with HBV.

	Advise those infected with HBV to reduce infection transmission by: • Do not donate blood, semen, breast milk, body organs or tissues; • Do not share toothbrushes, dental floss, razors, earrings or manicure/pedicure equipment (articles that might have traces of blood); • Keep all open cuts and sores bandaged until healed; • Inform sexual partner(s) that they are infected with HBV. Advise sexual partners of the availability of hepatitis B vaccine. Protection from infection cannot be ensured until the vaccine series has been completed and a protective anti-HBs level demonstrated through testing. Use of latex condoms will reduce the risk of HBV transmission; • For acute cases of HBV, practice safer-sex until partners and/or relevant contacts have been appropriately screened and/or vaccinated, or abstaining from sexual contact; • Put articles with blood on them (e.g. tampons, pads, tissue, dental floss and bandages) in a separate plastic bag before disposing into household garbage; • Dispose of bloody sharp items (e.g. razor blades, needles, etc.) into a hard container, taped shut; • Use bleach to clean up blood spills. Wet surfaces with 1 part bleach to 9 parts water and leave sitting for 10 minutes before wiping off; • Do not share drug snorting or smoking equipment such as straws or pipes, or injection equipment such as cookers, cotton, filters, water, syringes and needles; • Encourage pregnant females to engage in prenatal care and ensure that the child receives appropriate HBV immunization and immunoprophylaxis to prevent perinatal transmission; • Advise their doctor, dentist, and anyone who might come into contact with their blood (such as those who do acupuncture, electrolysis, body piercing and tattooing) that they are infected with HBV. General prevention measures include: • Counselling/education regarding risk behaviours; • Harm reduction strategies such as needle exchange programs; • Individual immunization with Hepatitis B vaccine by universal immunization programs; • Prenatal screening for all women for each pregnancy so that newborns can receive prophylaxis if necessary. Skin Piercing/Tattooing Procedures • Individuals considering tattooing, body piercing, or acupuncture should be counselled to ensure that these practices are carried out with sterile, preferably one-time-use equipment. Sexual Activity • The risk of transmission increases with multiple sexual partners, co-infection with HIV (and other STIs), and high-risk sexual behaviour (i.e., where blood is present); • Sexual partners should be notified and offered testing; • Recommend use of condoms; • Infected women should avoid unprotected sex during menstruation, as the virus may be present in menstrual blood.

	Vertical Transmission • Transmission of HBV from mother to baby may occur at the time of birth; • Breastfeeding is recommended in general because of its proven health benefits. Risk of HBV transmission is only theoretical. If the nipples are bleeding or cracked, it is recommended that breastfeeding be suspended until they are healed; • Women who wish to take no risk may choose to use alternative feeding methods.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine
Occupational Health	Immediate medical assessment and treatment after needlestick or significant body fluid exposure. See Protocol for the Blood and Body Fluid Exposure (section 5.2).
Surveillance	
Case Definition	**1. Acute case** **Confirmed case:** • Hepatitis B surface antigen (HBsAg) and immunoglobulin M (IgM) antibody to hepatitis B core antigen (anti-HBc-IgM) positive in the context of a compatible clinical history (including serum aminotransferase levels greater than 2.5 times the upper limit of normal) or probable exposure. • Clearance of HBsAg in a person who was documented to be HBsAg positive within the last six months in the context of a compatible clinical history or probable exposure. **Probable case:** • Acute clinical illness in a person who is epidemiologically linked to a confirmed case. **2. Chronic carrier** **Confirmed case:** • HBsAg positive for more than 6 months **OR** • Detection of HBsAg in the documented absence of anti-HBc-IgM **OR** • Detection of HBV DNA for more than 6 months **3. Unspecified** **Confirmed case:** • Does not fit the criteria for acute or chronic hepatitis B **AND** • HBsAg positive **OR** detection of HBV DNA
Reporting Requirements and Forms	**Hepatitis B is a notifiable infection in Nunavut:** 1. Complete the *Hepatitis B Report Form* (dated July 2014 or later) and the *Bloodborne Infections Contact Investigation Form* (dated July 2014 or later). 2. Fax the forms, within 24 hours of case notification to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833 3. If you cannot contact your RCDC, contact the TCDC at: 867-975-5775. 4. The Office of the Chief Medical Officer of Health may request case report forms and contact investigation forms from the RCDC as needed.

Tools

Guidelines	
Materials & Resources	Fact Sheet: Hepatitis B
Cross Reference	Nunavut Communicable Disease Manual: Blood and Body Fluid Exposure Protocol Nunavut Immunization Manual: Hepatitis B Immunization Protocol Nunavut Immunization Manual: Hepatitis B Immune globulin Protocol

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at http://www.health.alberta.ca/professionals/notifiable-diseases-guide.html

Canadian Guidelines on Sexually Transmitted Infections. Available online at: http://www.phac-aspc.gc.ca/std-mts/sti-its/

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Larke, R.P.B., Froese, G.J., Devine, R.D.O. and Petruk, M.W. (1987). Extension of the epidemiology of hepatitis B in circumpolar regions through a comprehensive serologic study in the Northwest Territories of Canada. Journal of Medical Virology; 22:269-276.

Morris S., Bain V., Villeneuve J.-P., Myers R.P., Cooper C., Martin S., Lowe C. (2004). Management of Viral Hepatitis: A Canadian Consensus Conference 2003/2004. Ottawa (ON): Health Canada. Available online at: http://pubs.cpha.ca/PDF/P16/21248e.pdf

Morris S, Bain V, Villeneuve J-P, Myers RP, Cooper C, Martin S, Lowe C. The management of Chronic Viral Hepatitis: A Canadian Consensus Conference 2004, Can J Infect Dis Med Microbiol. 2004 Nov-Dec; 15(6): 313–326. Available online at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2094989/

Nova Scotia Communicable Diseases Manual. Available online at: http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Infectious Disease Protocols. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Public Health Agency of Canada. Primary Care Management of Hepatitis B - Quick Reference. 2013. Available online at: http://www.phac-aspc.gc.ca/publicat/hep/hbv-vhb/exec-eng.php.

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 16, 2015.

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

Fill in OR affix CASE addressograph here

Last Name: ______________________

First Name: ______________________

Sex: ☐ Male ☐ Female ☐ Other

Date of Birth: ____(DD) ________(month) _____(YYYY)

Chart#: _________________________

Health Card #: _________________________

Community of Residence: __________________

Hepatitis B Case Report Form

Case Status:
* Do NOT send forms to territorial office unless this is a <u>new</u> case

☐ Initial	___(DD) ____(MM) ____(YYYY)	☐ Acute	☐ Chronic	☐ Unknown
☐ Follow-up	___(DD) ____(MM) ____(YYYY)	☐ Acute	☐ Chronic	☐ Unknown
☐ Final	___(DD) ____(MM) ____(YYYY)	☐ Acute	☐ Chronic	☐ Unknown

BOX 1.1 – DEMOGRAPHIC INFORMATION

Origin (*check **one** box only, unless specified*):

☐ Canadian Inuit ☐ Canadian Non-Aboriginal ☐ Foreign-born (*specify country of birth*): ______________________

☐ Canadian Métis ☐ Other Aboriginal (*specify*): ______________________________

BOX 1.2 – REASONS FOR TESTING

Reason for testing (*check all that apply*):

☐ Symptomatic of Hepatitis B
☐ Contact of a case
☐ STI Screening
☐ TB Screening
☐ Other (*specify*): ____________________________

BOX 1.3 – CLINICAL INFORMATION

Hospitalized due to infection: ☐ Yes ☐ No ☐ Unknown

Previously tested positive: ☐ Yes ☐ No ☐ Unknown

If yes, report year __________________

Location__________________________

BOX 1.4 – SYMPTOMS

(Check all that apply)

Symptom	Onset Date (dd/mm/yyyy)
☐ None	N/A
☐ Anorexia	
☐ Nausea	
☐ Vomiting	
☐ Abdominal Cramps	
☐ Fatigue	
☐ Other (specify):	

BOX 1.5 – TESTING

	Initial Test		Follow-up Test	
Test Type	**Date Collected** (dd/mm/yyyy)	**Result** (check one)	**Date Collected** (dd/mm/yyyy)	**Result** (check one)
HBsAg (indicates infection)		☐ Positive ☐ Negative ☐ Other ________________		☐ Positive ☐ Negative ☐ Other ________________
Anti-HBs (immune status)		☐ Positive ☐ Negative ☐ Other ________________		☐ Positive ☐ Negative ☐ Other ________________
Hepatitis A IgG (immunity)				☐ Positive ☐ Negative ☐ Other ________________

Patient: Last Name_____ First Name_____

BOX 1.6 – RISK FACTORS

Risk factors in the 12 months prior to new diagnosis:

***Sexual**:			
Sex without a condom:	☐ Yes	☐ No	☐ Unknown
Multiple sex partners:	☐ Yes	☐ No	☐ Unknown
Men who have sex with men:	☐ Yes	☐ No	☐ Unknown
Sex with IDU:	☐ Yes	☐ No	☐ Unknown
Sex with known Hepatitis B case:	☐ Yes	☐ No	☐ Unknown
Other: _____			
Medical (indicate when and where in Box 1.7):			
Dental Care (last 6-12 months):	☐ Yes	☐ No	☐ Unknown
Diagnostic/surgical procedure:	☐ Yes	☐ No	☐ Unknown
Renal Dialysis:	☐ Yes	☐ No	☐ Unknown
Other:			
‡Received blood products/cells/tissues/organs:	☐ Yes	☐ No	☐ Unknown
‡Donated blood products/cells/tissues/organs:	☐ Yes	☐ No	☐ Unknown
Perinatal Transmission:	☐ Yes	☐ No	☐ Unknown
§Injection drug user (IDU):	☐ Yes	☐ No	☐ Unknown
§Needle sharing, e.g. IDU/tattoo/piercing:	☐ Yes	☐ No	☐ Unknown
Household contact of Hepatitis B case:	☐ Yes	☐ No	☐ Unknown
Occupational exposure, e.g. Needle stick:	☐ Yes	☐ No	☐ Unknown
Other (*specify*): _____			

* If YES to sexual risk factors, consider testing for chlamydia, gonorrhea, HIV, and syphilis
‡ Query lifetime history and indicate when and where in Box 1.7
§ If YES to IDU and/or needle sharing, test for Hepatitis C

BOX 1.7 – NOTES (for health care worker use)

_____

_____

_____

_____

_____

_____

Bloodborne Infections Contact Investigation Form completed?	☐ Yes	☐ No
Hepatitis A vaccination offered if non-immune?	☐ Yes	☐ No

REPORTING CLINICIAN

Reporter Name:_____ **Contact Information:** _____

Report Date: (dd/mm/yyyy)_____

Fax completed form to the Regional CDC:

- ○ Kitikmeot: (867) 983-4088
- ○ Kivalliq: (867) 645-8272
- ○ Qikiqtaaluk: (867) 975-4833

5.4.1 Hepatitis C

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Hepatitis C virus (HCV), a RNA virus with at least 6 existing genotypes. Genotype 1 predominates in Canada, but all types have been seen.
Clinical	
Clinical Presentation	Most cases are usually asymptomatic or have mild illness. When symptoms are present, the onset is insidious and may include anorexia, vague abdominal discomfort, nausea, vomiting, fatigue and occasionally jaundice. HCV antibody seroconversion window period is approximately 5-10 weeks. Chronic HCV infection can be defined as continuing disease without improvement for at least 6 months. High percentages (50-80%) of infected persons develop chronic infection; chronic infections may present with disease flares and similar symptoms and signs. Of chronically infected persons 10-20% may eventually develop cirrhosis and 1-5% may develop hepatocellular carcinoma. Approximately 25% (range 15 to 45%) of HCV infections will resolve spontaneously.
Diagnostics	Follow your regional laboratory procedures. Serologic testing (for anti-HCV) is commonly used to determine if a person is exposed to HCV. Note that a person who tests positive for anti-HCV will test positive for life and does not need to be retested for anti-HCV. Anti-HCV testing should not be performed in infants less than 18 months of age as the anti-HCV, if detected, may represent passive maternal antibody. As most infections occur at the time of childbirth, if testing for HCV RNA is considered, it should be delayed beyond 4 to 12 weeks to avoid false-negative HCV RNA test results. Cord blood should not be used because of potential cross-contamination with maternal antibody.
Treatment	Refer to physician for clinical follow-up.
Pathogen	
Occurrence	**Worldwide**: It is estimated that approximately 3% of the world's population (or 180 million persons) are infected, 130 million of whom are chronic HCV carriers at risk of developing liver cirrhosis and/or liver cancer. In addition, it is estimated that three to four million people worldwide are newly infected with HCV each year. **Canada**: The current risk for HCV transmission from blood transfusion is very low; all blood donations are screened by Canadian Blood Services for HCV. **Nunavut**: HCV infection is present but accurate epidemiologic data are unavailable.
Reservoir	Humans.
Transmission	Possible routes of transmission include: • Percutaneous exposure to HCV-contaminated equipment (e.g. injection drug use paraphernalia, needle stick puncture, razors, tattoo and piercing equipment, etc.); • Exposure to HCV-infected blood in an open cut or mucous membrane; • Transfusion or transplantation; • Sexual contact (rarely); • Perinatal transmission from an HCV-infected mother (rarely).

Incubation Period	Usually 45-180 days, average 60-90 days.
Communicability	From one or more weeks before the onset of symptoms (if present); virus persists indefinitely in most persons without treatment. Cases testing PCR negative after treatment should still take steps to prevent transmission due to the remote possibility of transient viremia.
Susceptibility and Resistance	Susceptibility is general. The degree of immunity following infection is unknown.

Public Health Management

Case

All laboratory reports of HCV positive individuals should be followed up unless the individual is known to be infected and has previously been managed.

- Review the patient's chart to determine if the individual has been previously reported
- If no indication of previous positive result or no information is available, consult with the Regional Communicable Disease Coordinator (RCDC) who will check with the Office of Chief Medical Officer of Health.

If the case is a new diagnosis of HCV, ensure follow-up by the community physician.

Contact and interview the case.

- Interview the case for history of exposure and risks.
- Complete the *Hepatitis C Report Form* (dated July 2014 or later), including information pertaining to the donation or receipt of blood or tissue.
- If the individual has previously donated or received blood cells or tissues, report to the RCDC, who will consult with the Chief Medical Officer of Health (CMOH)/Deputy CMOH to decide on the need for lookback/traceback.
- Note on the problem record section of the chart if the person is known to have Hepatitis C.

Considerations for other communicable infections:

- Any patient with HCV infection believed to have been acquired parenterally should be considered to be at risk for HIV and HBV, and should be offered testing for both.

- Encourage hepatitis A and B vaccination, which are publicly-funded for non-immune HCV-infected individuals.

Educate the case as follows.

- Range of clinical presentation varies from very ill to no symptoms;
- Long-term prognosis and concept of carrier status; note that a high percentage of patients progress to chronic liver disease over a period of 30 to 40 years with the associated risks for developing cirrhosis or liver cancer. Reassure and support clients when discussing long-term prognosis;
- Routes of transmission, risk behaviours and prevention. Note that the risk of sexual transmission appears to be lower for HCV than for HBV or HIV, however HCV infected persons have a responsibility to inform potential sexual partners that there is a risk of infection. The risk of transmission may increase with repeated sexual exposures, therefore long term sexual

	partners of HCV infected persons should be offered testing by their health care provider; • Negative impact of alcohol use on disease progression. Encourage abstinence from alcohol; **Advise HCV cases to reduce transmission of infection to others by:** • Do not donate blood, semen, breast milk, body organs or tissues; • Do not share toothbrushes, dental floss, razors, earrings or manicure/pedicure equipment (articles that might have traces of blood); • Keep all open cuts and sores bandaged until healed; • Inform sexual partner(s) that they are infected with HCV. Use of latex condoms may reduce the rare risk of HCV transmission. Infected women should avoid unprotected sex during menstruation, as the virus may be present in menstrual blood; • Put articles with blood on them (e.g. tampons, pads, paper tissue, dental floss and bandages) in a separate plastic bag before disposing into household garbage; • Dispose of bloody sharp items (e.g. razor blades, needles, etc.) into a hard container, taped shut; • Use bleach to clean up blood spills. Wet surfaces with 1 part bleach to 9 parts water and leave sitting for 10 minutes before wiping off; • Don't share drug snorting or smoking equipment such as straws or pipes, or injection equipment such as cookers, cotton, filters, water, syringes and needles; • Advise their doctor, dentist, and anyone who might come into contact with their blood (such as those who do acupuncture, electrolysis, body piercing and tattooing) that they are infected with HCV.
Contacts	Identify contacts who fall into the following categories: • Injection drug users who shared injection equipment with the case • Infants of HCV positive mothers • Long term sexual partners There is no effective post-exposure prophylaxis available for Hepatitis C. Most long-term sexual partners of HCV positive persons test anti-HCV negative, however, they may elect to be assessed by their health care provider. Infants born to HCV positive mothers should be followed up by a pediatric infectious disease physician or an expert in HCV infection. Note: lab tests may be positive for prolonged period due to passive transfer from mother. A definitive diagnosis may not be possible until 18 to 24 months. Household contacts do not require further follow-up due to low risk of transmission. **Complete the *Bloodborne Infections Contact Investigation Form*** (dated July 2014 or later).
Outbreaks	If a higher than normal amount of disease activity is detected, contact your RCDC.
Health Education	Injection Drug Use (IDU) • The identification of injection drug users, with harm reduction counselling and education about the infection, is critical for prevention. Harm reduction efforts may include participation in needle-exchange programs, participation in addiction programs and drug substitution.

	Skin Piercing/Tattooing Procedures • Individuals considering tattooing, body piercing, or acupuncture should be counselled to ensure that these practices are carried out with sterile, preferably one-time-use equipment. Sexual Activity • Transmission from partner to partner in a long-term relationship is rare, however, the risk of transmission increases with multiple sexual partners, co-infection with HIV, and high-risk sexual behaviour (i.e., where blood is present); • Sexual partners should be notified and offered testing; • Recommend use of condoms in short-term sexual relationships/multiple partners and with any high risk sexual behaviour (i.e., where blood is present). Vertical Transmission • Transmission of HCV from mother to baby may rarely occur at the time of birth; • Breastfeeding is recommended in general because of its proven health benefits. Risk of HCV transmission is only theoretical. If the nipples are bleeding or cracked, it is recommended that breastfeeding be suspended until they are healed; • Women who wish to take no risk may choose to use alternative feeding methods.
Health Settings Management	
Infection Control Measures	Routine Precautions
Occupational Health	Immediate medical assessment after needlestick or significant body fluid exposure. See Blood and Body Fluid Exposure Protocol (section 5.2).
Surveillance	
Case Definition	**Confirmed Case (Does not distinguish acute from chronic infection):** • Detection of anti-hepatitis C antibodies (positive anti-HCV tests should be confirmed by a second manufacturer's EIA, immunoblot or NAT for HCV RNA); **OR** • Detection of hepatitis C virus RNA. Anti-HCV testing should not be performed in infants less than 18 months of age as the anti-HCV, if detected, may represent passive maternal antibody. As most infections occur at the time of childbirth, if testing for HCV RNA is considered, it should be delayed beyond 4 to 12 weeks to avoid false-negative HCV RNA test results. Cord blood should not be used because of potential cross-contamination with maternal antibody.
Reporting Requirements and Forms	**Hepatitis C is a notifiable infection in Nunavut:** 1. Complete the *Hepatitis C Report Form* (dated July 2014 or later) and the *Bloodborne Infections Contact Investigation Form* (dated July 2014 or later). 2. Fax the forms, within 24 hours of case notification to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833

	3. If you cannot contact your RCDC, contact the TCDC at: 867-975-5775. 4. The Office of the Chief Medical Officer of Health may request case report forms and contact investigation forms from the RCDC as needed.

Tools

Guidelines	
Materials & Resources	**Fact Sheet: Hepatitis C**
Cross Reference	Nunavut Communicable Disease Manual: Blood and Body Fluid Exposure Protocol

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at http://www.health.alberta.ca/professionals/notifiable-diseases-guide.html

BC Centre for Disease Control. Management of Specific Diseases: Hepatitis C (July 2013). Available online at http://www.bccdc.ca/NR/rdonlyres/CEC67337-3E94-4FD3-B21C-63A71014619D/0/CPS_Hep_Guidelines_HCV_20130709.pdf

Canadian Guidelines on Sexually Transmitted Infections. Available online at http://www.phac-aspc.gc.ca/std-mts/sti-its/

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Infectious Disease Protocols. Available online at http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

The Management of Chronic Viral Hepatitis: A Canadian Consensus Conference 2004. Available online at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2094989/

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on September 15, 2015.

5.5.1 Human T-cell Lymphotropic Virus, Type 1 (HTLV-1)

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Human T-cell Lymphotropic Virus, Type 1 (HTLV-1). HTLV-1 is a retrovirus that infects t-cells. Most often it is asymptomatic but it does have disease associations as described below.
Clinical	
Clinical Presentation	HTLV-1 is usually an asymptomatic infection; however there are two main disease associations that may occur in up to 5% of carriers: 1. Adult T-cell leukemia/lymphoma (ATLL) develops in 2-5% of those infected. 2. HTLV-1–associated myelopathy/tropical spastic paresis (HAM/TSP) develops up to 2% of carriers. Other associated conditions HTLV-1 include uveitis, infectious dermatitis in children and pulmonary and rheumatologic disorders.
Diagnostics	Serologic testing is used to determine if a person is infected with HTLV-1. Follow your regional laboratory procedures. Once an individual is confirmed as being HTLV-1 positive repeated testing is not necessary.
Treatment	There is no cure or treatment available.
Pathogen	
Occurrence	**Worldwide:** HTLV-1 infections are endemic in southwest Japan, the Caribbean basin, Taiwan, sub-Saharan Africa, and areas of South and Central America. In certain parts of Japan, seroprevalence is higher than 30% of the adult population and increases with age. **Canada:** HTLV-1 is rare in Canada. Canadian Blood Services has been screening donated blood for HTLV-1 since 1990 and reports an average of 10–12 positive tests per 800,000 donations annually (prevalence of 0.0014%). **Nunavut:** HTLV-1 infection is present in Nunavut. The prevalence, based on a seroprevalence study from 2006, is estimated to be 3.1 per 1,000 people (0.31%).
Reservoir	Humans
Transmission	HTLV-1 is spread from person to person via: • Sexual contact. • Transfusion of blood from an HTLV-1 infected donor. • Percutaneous (needle stick or injection drug use when equipment is shared). • Vertical transmission through breastfeeding and possibly through pregnancy.
Incubation Period	Ranges from months to years or even decades.
Communicability	Communicable for as long as the virus is present (lifelong).
Susceptibility and Resistance	Unknown

Public Health Management

Case	HTLV-1 is a reportable illness. After careful review Nunavut no longer conducts prenatal screening. HTLV-1 positive individuals should be followed by their health care provider as per the clinical guidelines in sections 5.5.2 and 5.5.3.
Contacts	No contact tracing is required.
Outbreaks	If a higher than normal amount of disease activity is detected, contact your Regional Communicable Disease Coordinator (RCDC).
Health Education	See sections 5.5.2 and 5.5.3

Health Settings Management

Infection Control Measures in Health Care Settings	Routine precautions
Occupational Health	Not applicable

Surveillance

Case Definition	A positive HTLV-1 laboratory result.
Reporting Requirements and Forms	Positive laboratory results are copied to the Office of the Chief Medical Officer of Health.

Tools

Materials & Resources	Managing HTLV-1 in Nunavut: A Guide for Health Care Providers (section 5.5.2) Clinical Guidelines for the Follow-up of HTLV-1 Seropositive Individuals (section 5.5.3)

References

Sibbald, B. (2006). HTLV-1 virus detected in Nunavut. CMAJ 174(2); 150-151. Available online at: www.cmaj.ca/content/174/2/150.full

Scadden, Freedman, Robertson (updated October 2012) Human T-lymphotropic virus type I: Disease associations, diagnosis, and treatment. Available at www.uptodate.com

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Fahim, S., Prokopetz, R., Jackson, R., Faught, C., McCarthy, A.E., Andonov, A., Coulthart, M., Daw, Z., Olberg, B., Giulivi, A. and Padmore, R. (2006). Human T-cell lymphotropic virus type 1-associated adult T-cell leukemia/lymphoma in the Inuit people of Nunavut. CMAJ 175(6); 579-581. Available online at: www.cmaj.ca/content/175/6/579.full

The Johns Hopkins Microbiology Newsletter. (1998). 17(23). Available online at: *pathology5.pathology.jhmi.edu/micro/v17n23.htm*

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on December 16, 2013.

5.5.2 Managing HTLV-1 in Nunavut

A Guide for Health Care Providers

In 2005 a cluster of cases of HTLV-1 infection were identified in Nunavut that resulted in the introduction of prenatal screening and clinical guidelines for infected individuals. In the past six years only 12 additional cases have been identified despite prenatal screening. The incidence in 2005 is felt to be an isolated cluster and as such prenatal screening is no longer recommended.

However, given the number of documented cases (n=40) in the territory, it is important that health care providers have sufficient knowledge of HTLV-1 to appropriately assess those patients with known HTLV-1 infection.

HTLV-1 is a retrovirus that can be transmitted through sexual contact, blood-to-blood contact and vertical transmission during prolonged breastfeeding. Infection is lifelong as there are no effective treatments.

The vast majority of individuals with HTLV-1 infection will be asymptomatic. However, there are two main disease associations that may occur in up to 5% of infected individuals.

1) Adult-t cell Leukemia-Lymphoma (ATL) – ATL occurs in 2-5% of those infected with HTLV-1. It typically presents 20-30 years after infection. Clinical features may include skin lesions, lytic bone lesions, pulmonary infiltrates, lymphadenopathy, hepatosplenomegaly and hypercalcemia. While limited treatment is available, prognosis is poor.

2) HTLV-1 associated myelopathy/tropical spastic paraparesis (HAM/TSP) – HAM/TSP occurs in up to 2% of HTLV-1 carriers. Onset is a median of 3 years after infection although it may present decades later. The illness is a progressive myelopathy of the lower limbs. Clinical features may include proximal lower limb weakness and spasticity, paresthesias, lumbar pain, urinary frequency, nocturia and incontinence. Corticosteroids may slow progression.

Other associated conditions include infective dermatitis in children, uveitis and rheumatologic and pulmonary disorders.

The Canadian Blood Services system routinely screens for the presence of HTLV-1 in donations to prevent transmission via blood transfusions. Other strategies to prevent transmission include using condoms, not sharing needles and avoiding prolonged breastfeeding by mothers known to be seropositive.

5.5.3 Clinical Guidelines for the Follow-Up of HTLV-1 Seropositive Individuals

Individuals who have been tested and found to be HTLV-1 positive should have the following clinical follow-up **every 12 months**. The history and physical exam should be directed to detect early findings suggestive of Adult T-cell Leukemia/ Lymphoma (ATL), and/or the neurological sequelae of HTLV-1 Associated Myelopathy (HAM).

On History:
- muscle weakness of the lower extremities
- paresthesias of the lower limbs
- urinary incontinence
- a change in chronic rash, or the onset of a new rash
- new onset of bony pain
- new lymphadenopathy
- depression screen

Physical Exam:
- testing of proximal muscle strength of the lower limb
- observation of gait
- testing of patellar DTR's assessing for hyper-reflexia
- testing for clonus
- a dermatologic exam
- palpation for lymphadenopathy
- examination for hepatosplenomegaly

Counselling:
- Condom use
- Discuss breastfeeding risks (if applicable)

Investigations
- CBC and Ca^{2+} every 12 months
- Biopsy of suspicious skin lesions
- LDH at initial visit and later if suspicious for malignancy
- HIV, syphilis, hepatitis C, screening initially and as indicated
- TB screening initially and as indicated

Referrals
- Early referral to internal medicine and/or hematology for any suspicion of leukemia/lymphoma based off exam findings or CBC
- Early referral to physiotherapy and neurology if any suspicion of HAM
- Early referral to mental health as indicated
- If pregnant or considering breastfeeding patients in the Qikiqtani region should be referred to a QGH obstetrics physician. Patients from the Kitikmeot and Kivalliq regions should discuss breastfeeding risks with a physician.

6.0 Sexually Transmitted Infections

Purpose

The purpose of this section of the Communicable Disease Manual is to provide guidelines for the investigation and management of individuals who have been diagnosed with notifiable sexually transmitted infections (STIs) including Chancroid, Chlamydia, Gonorrhea and Syphilis. Note that HIV/AIDS and Hepatitis B infection can be transmitted through sexual contact but they are included in the section on Blood-Borne Infections.

Legislation/Policy

Authority for the reporting of notifiable STIs and the public health management comes from the *Public Health Act, Communicable Disease Regulations.*

All clients who have been diagnosed with a notifiable STI must be reported to the Chief Medical Officer of Health (CMOH).

All clients who are suspected to have or have a confirmed notifiable STI are to be followed as per the protocol in this section.

Roles and Responsibilities

Table 6.1 Roles and responsibilities for follow-up of notifiable STIs

Role	Responsibilities
Laboratory	• Report all laboratory-confirmed cases of STIs to the CMOH or designate.
Health Care Provider team (e.g. Physician, Nurse Practitioner, Community Health Nurse, etc.)	• Test all clients suspected to have a STI. • Treat clients with a diagnosis of STI. • Complete public health case and contact management of clients with a STI. • Complete the STI Report Form(s) and send it to the Regional Communicable Disease Coordinator (RCDC). • Review Hepatitis B immunization status with client.
Regional Communicable Disease Coordinator	• Provide advice on a regional basis for the case and contact management of STIs. • Receive and review reports of STIs. • Consult with the Territorial Communicable Disease Consultant (TCDC) as required.
Territorial Communicable Disease Consultant	• Provide advice on a territorial basis for the case and contact management of STIs.
Epidemiologist	• Ensure cases are included in the communicable disease information system.
Chief or Deputy Chief Medical Officer of Health	• Be available for consultation on STIs. • Make program recommendations.

6.1.1 Chancroid

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	*Haemophilus ducreyi (H. ducreyi),* a gram-negative coccobacillus.
Clinical	
Clinical Presentation	An acute bacterial infection localized in the genital area and characterized clinically by single or multiple painful, necrotizing ulcers at the site of infection. The symptoms can be confused with Syphilis and a culture is needed to confirm diagnosis (however Chancroid tends to be very painful whereas Syphilis lesions are painless). Chancroid rarely spreads from the genital tract and does not cause systemic disease.
Diagnostics	Diagnosis is made based on the appearance of the ulcers/lymph nodes and laboratory testing of a sample of discharge or pus. This is generally made by excluding other infections that are associated with genital ulcer disease such as Herpes, Syphilis or Lymphogranuloma Venereum (LGV). Follow your regional laboratory procedures for specimen collection.
Treatment	Refer to the *Canadian Guidelines on Sexually Transmitted Infections* (January 2010 or current – http://www.phac-aspc.gc.ca/std-mts/sti-its/). Buboes should be aspirated or incised to relieve pain and prevent spontaneous rupture. Consult with a physician. Asymptomatic carriage can occur.
Pathogen	
Occurrence	**Worldwide:** Chancroid has been widespread in areas of the world where sexually transmitted infection (STI) control is inadequate. Vulnerable females (particularly sex workers with limited access to care) who have multiple partners in spite of genital ulceration are the usual reservoir. Chancroid can only remain endemic in this context. Reintroduction into societies in which Chancroid has been eliminated occasionally occurs with travel. **Canada:** Rare. Outbreaks in the late 1970s and early 1980s occurred but numbers are generally low. Chancroid is not a nationally reportable infection. **Nunavut:** Rare. There has been a single reported case since 2000.
Reservoir	Humans.
Transmission	Direct sexual contact with discharge from open lesions and pus from buboes. Autoinoculation to non-genital sites may occur in infected people. Nonsexual transmission is rare.
Incubation Period	3 to 5 days, up to 14 days.
Communicability	The infection may be passed until lesions or buboes are healed. Without appropriate antibiotic treatment, the infectious agent may persist in the lesion or discharging lymph nodes for several weeks or months. Treatment with appropriate antibiotics eradicates *H. ducreyi* and lesions generally heal in one to three weeks.

Susceptibility and Resistance	Susceptibility is general; uncircumcised males are at higher risk than circumcised males. There is no evidence of natural resistance. Chancroid ulcers are associated with an increased risk of acquiring HIV.
Public Health Management	
Case	• Contact and interview the case. Cases should be interviewed for history of exposure, risk assessment, and sexual partner(s) identification. • If genital ulcers are present, test for Herpes, and consider testing for LGV and/or Granuloma Inguinale using the appropriate test medium. • Test for other concurrent STI infection (e.g. Gonorrhea, Chlamydia, Syphilis, HIV, Hepatitis B). • Immunization against Hepatitis B is recommended, if the vaccine series is not already complete. • All cases should be instructed about infection transmission. • Ensure the case receives appropriate antibiotic treatment as determined by the attending health care provider. • Identify all sexual partner(s) in the 2 weeks before symptom onset. Refer to the Contacts section below. • If Chancroid is diagnosed in children and youth under the age of 16, sexual abuse must be considered. The clinician should consult with a physician for testing and determine whether there are reasonable and probable grounds to believe the child or youth is in need of protection. Under Section 8-1 of the Child and Family Services Act, a person who has information of the need of protection of a child shall, without delay, report the matter to a Child Protection Worker or if not available to a peace officer or an authorized person.

Contacts	Partner notification will identify those at risk and reduce infection transmission and/or reinfection.
	
	• Every attempt should be made to identify, locate, examine and treat sexual partners/contacts of cases.
	  ○ All contacts in the 2 weeks prior to symptom onset, regardless of signs or symptoms, must be located, tested and empirically treated regardless of clinical findings and without waiting for test results.
	• The length of time for the trace-back period should be extended:
	  ○ To include additional time up to the date of treatment;
	  ○ If the index case states that there were no partners during the recommended trace-back period, then the last partner should be notified;
	  ○ If all partners traced (according to recommended trace-back period) test negative, then the partner prior to the trace-back period should be notified.
	• All contacts should be offered STI testing.
	• All contacts should be instructed about infection transmission.
	• Complete the *STI Contact Investigation Form* dated September 2013 or later (section 6.1.3). Include additional pages for contact information as necessary.

Outbreaks	If higher than normal disease activity is detected, contact your Regional Communicable Disease Coordinator (RCDC). **Note**: since Chancroid is rare, a single case would be considered above normal activity.
Health Education	Under development.

Health Settings Management

Infection Control Measures in Health Care Settings	Routine precautions.
Occupational Health	Gloves for direct contact with infected areas.

Surveillance

Case Definition	**Confirmed case:** Isolation of *H. ducreyi* by standardized, validated and approved laboratory techniques (e.g. culture and PCR) from a clinical specimen.
Reporting Requirements and Forms	**Chancroid is a notifiable infection in Nunavut:** 1. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 6.1.2) and the *STI Contact Investigation Form* dated September 2013 or later (section 6.1.3). 2. Fax the forms, within 7 days of case notification, to the RCDC as follows: • Qikiqtaaluk: 867-975-4833 • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272

Tools

Guidelines	Canadian Guidelines on Sexually Transmitted Infections (January 2010 or later). Available online at: http://www.phac-aspc.gc.ca/std-mts/sti-its/
Materials & Resources	**Fact Sheet: Chancroid**
Cross Reference	Not applicable

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at http://www.health.alberta.ca/professionals/notifiable-diseases-guide.html

Canadian Guidelines on Sexually Transmitted Infections. Available online at http://www.phac-aspc.gc.ca/std-mts/sti-its/

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Infectious Disease Protocols. Available online at http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on June 3, 2013.

6.2.1 Chlamydia

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	*Chlamydia trachomatis (C. trachomatis)*, an intracellular bacterium.
Clinical	
Clinical Presentation	Chlamydia infection is asymptomatic in more than 50% of males and 70% of females.

Females	Males	Neonates & Infants
Cervicitis	Urethral discharge	Conjunctivitis (neonates)
Vaginal discharge	Urethritis	
Dysuria	Urethral itch	
Lower abdominal pain	Dysuria	Pneumonia (infants < 6 months)
Abnormal vaginal bleeding	Testicular pain	
Dyspareunia		

Major sequelae – Females	Major sequelae – Males
Pelvic inflammatory disease (PID)	Epididymo-orchitis
Infertility	
Ectopic pregnancy	
Chronic pelvic pain	Reactive arthritis (Reiter syndrome)
Reactive arthritis (Reiter syndrome)	

Diagnostics

A urine sample is used for the diagnosis of genital Chlamydia except for pediatric cases. Consult with a physician for appropriate testing of pediatric cases.

Special considerations for urine specimen collection:
- Individual **should not** urinate 1 hour before specimen collection;
- Do **not** clean the area first;
- Collect the first 10-50 ml of urine only.

If a pharyngeal swab is required, perform culture; however, note that since samples require lengthy transport in Nunavut the pathogen may not survive resulting in a false negative test. Results from culture should therefore be interpreted with caution and diagnosis should be determined by exclusion.

Note that blood in the urine can produce false positive results.

Treatment

Guidelines are based on *Alberta Treatment Guidelines for Sexually Transmitted Infections in Adolescents and Adults* (2012) (see References). Also refer to the *Canadian Guidelines on Sexually Transmitted Infections* (January 2010 or current – http://www.phac-aspc.gc.ca/std-mts/sti-its/)

Treatment for Chlamydia is indicated for the following:
- A positive Chlamydia test;
- Diagnosis of a syndrome compatible with a Chlamydial infection, without

waiting for the test results of *C. Trachomatis*;
- Diagnosis of Chlamydial infection in a sexual partner, whether symptomatic or not.

Type	Case	Preferred Treatment	Alternative Treatment
Urethral, endocervical, rectal, pharyngeal infection	Adults (non-pregnant and non-lactating)	Azithromycin 1 g PO x 1	Doxycycline 100 mg PO BID x 7 days
	Pregnant and breastfeeding women	• Azithromycin* 1 g PO x 1 **OR** • Amoxicillin 500 mg PO TID x 7 days	
Eye Infection	Adults‡ and children (>9 years)	Doxycycline§ 100 mg PO BID x 14 days	Azithromycin 1 g PO x 1

*Available data suggests that Azithromycin is safe and effective in pregnant and lactating women.

‡For Children < 9 years of age, consult pediatric Infectious Disease Physician. All patients should also have genitourinary specimens submitted for *C. trachomatis.*

§Doxycycline is contraindicated in pregnant women.

Neonates born to women with untreated Chlamydia need to be closely monitored for signs of Chlamydia infection. Prophylaxis is not recommended unless follow-up cannot be guaranteed.

Pathogen

Occurrence	**Worldwide:** Chlamydia is one of the most frequently reported sexually transmitted infections (STIs) worldwide, with an estimated 92 million cases reported annually. **Canada:** Chlamydia infections are the most commonly reported STI, accounting for more than three quarters of all reported STIs. Persons between the ages of 15 and 29 years typically represent the majority of reported cases. The national 2009 rate was 259 per 100,000. **Nunavut:** The rate of Chlamydial infection has remained above the national average since reporting began in 1999. In 2011, the territorial Chlamydia rate was 3,922 per 100,000. Females 15 to 19 years old consistently have a higher rate than males and the highest of all age groups.
Reservoir	Humans.
Transmission	Exchange of infected secretions during intimate contact via oral, vaginal, cervical, urethral or anal routes. Vaginal, oral and anal intercourse is the primary source of transmission; however newborns delivered vaginally by infected mothers are at risk and may develop conjunctivitis and pneumonia.
Incubation Period	Poorly defined; usual time from exposure to onset of symptoms is 2 to 3 weeks, but can be as long as 6 weeks.
Communicability	Unknown; may extend for months or longer if untreated, especially in asymptomatic persons. Re-infections are common; individuals are advised to refrain from sexual contact until an effective course of antibiotic therapy is completed.

Susceptibility and Resistance	Susceptibility is general; the transmission probability of *C. trachomatis* has been estimated to be as high as 20% per genital sexual contact and is more efficient male-to-female than female-to-male. No acquired immunity has been demonstrated, although strain specific immunity probably exists.
Public Health Management	

Case	• Contact and interview the case regarding sexual history. Cases should be interviewed for history of exposure, risk assessment, sexual partners and/or perinatal contact(s).
	• Complete the *Chlamydia and Gonorrhea Report Form* dated September 2013 or later (section 6.2.2).
	• Determine the presence or absence of symptoms.
	• Determine risk factors and counsel about transmission:
	  ▪ Sexual contact with person(s) with known infections or compatible syndrome;
	  ▪ Unprotected sexual contact with partner(s);
	  ▪ Multiple partners;
	  ▪ New sexual partner or more than 2 partners in the past year;
	  ▪ Previous STIs;
	  ▪ Vulnerable populations (e.g. injection drug users, incarcerated individuals, sex trade workers, street youth, etc.);
	  ▪ Men who have unprotected sex with other men;
	  ▪ Alcohol and drug use.
	• Identify all sexual partner(s) in the 60 days before treatment, symptom onset or specimen collection (if asymptomatic). Refer to the Contacts section below.
	• Counsel the case about the importance of abstaining from unprotected sexual contact until 7 days after treatment of both the case and partner(s).
	• Consider testing for other STIs (e.g. Gonorrhea, Syphilis, HIV, Hepatitis B).
	• Consider immunization for Hepatitis B if not already immune.
	• If genital, rectal or oral infections are diagnosed in children and youth under the age of 16, sexual abuse must be considered. The clinician should consult with a physician for testing and determine whether there are reasonable and probable grounds to believe the child or youth is in need of protection. Under Section 8-1 of the Child and Family Services Act, a person who has information of the need of protection of a child shall, without delay, report the matter to a Child Protection Worker or if not available to a peace officer or an authorized person.
	
	Test of Cure is not routinely indicated if recommended treatment is administered, symptoms and signs disappear, and there is no re-exposure to an untreated partner. Test of Cure is indicated when:
	1. The treatment agent used is not listed as the preferred or alternate treatment in this protocol.
	2. Compliance is suboptimal or uncertain.
	3. Non-genital site involved (e.g. eye, pharynx, rectum).
	4. Patient is prepubertal.
	5. Patient is pregnant.
	Test of Cure, if needed, should be performed at 3-4 weeks after treatment completion.
	
	Follow-up screening at 6 months post-treatment is recommended for all cases as re-infection risk is high.

Contacts	Partner notification will identify those at risk, reduce infection transmission and/or re-infection and ultimately prevent infection sequelae.
	
	• Every attempt should be made to identify, locate, examine and treat partners/contacts of all cases.
	  ○ All contacts in the 60 days prior to symptom onset or date of specimen collection, regardless of signs or symptoms, must be located, tested and empirically treated regardless of clinical findings and without waiting for test results.
	  ○ It may be necessary to extend this 60 day time period until sexual partner(s) are identified.
	• All contacts should be offered STI testing.
	• All contacts should be instructed about infection transmission.
	• Parents of infected neonates (eg. mother and her sexual partner[s]) should be located, clinically evaluated and empirically treated regardless of clinical findings and without waiting for test results.
	• Complete the *STI Contact Investigation Form* dated September 2013 or later (section 6.2.3). Include additional pages for contact information as necessary.

Outbreaks	If a higher than normal amount of disease activity is detected, contact your RCDC.
Health Education	Under development.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine precautions.
Occupational Health	Gloves for direct contact with infected areas.
Surveillance	
Case Definition	**Confirmed case:** **1. Genital infection:** Laboratory evidence of infection in genitourinary specimens: • Detection of *C. trachomatis* by culture **OR** • Detection of *C. trachomatis* nucleic acid **OR** • Detection of *C. trachomatis* antigen **2. Extra-genital infection:** Laboratory evidence of infection in rectum, conjunctiva, pharynx and other extra-genital sites: • Detection of *C. trachomatis* by culture **OR** • Detection of *C. trachomatis* nucleic acid **OR** • Detection of *C. trachomatis* antigen **3. Perinatally acquired infections:** Laboratory evidence of infection: Detection and confirmation of *C. trachomatis* in nasopharyngeal or other respiratory tract specimens from an infant in whom pneumonia developed in the first six months of life:

	• Isolation of *C. trachomatis* by culture **OR** • Demonstration of *C. trachomatis* nucleic acid **OR** • Demonstration of *C. trachomatis* antigen **OR** Detection and confirmation of *C. trachomatis* in conjunctival specimens from an infant who developed conjunctivitis in the first month of life: • Isolation of *C. trachomatis* by culture **OR** • Demonstration of *C. trachomatis* nucleic acid **OR** • Demonstration of *C. trachomatis* antigen
Reporting Requirements and Forms	**Chlamydia is a notifiable infection in Nunavut:** 1. Complete the *Chlamydia and Gonorrhea Report Form* dated September 2013 or later (section 6.2.2) and *STI Contact Investigation Form* dated September 2013 or later (section 6.2.3). 2. Fax the forms, within 7 days of case notification, to the RCDC as follows: • Qikiqtaaluk: 867-975-4833 • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272

Tools

Guidelines	Alberta Treatment Guidelines for Sexually Transmitted Infections in Adolescents and Adults (2012). Available online at http://www.health.alberta.ca/documents/STI-Treatment-Guidelines-2012.pdf%20 Canadian Guidelines on Sexually Transmitted Infections (January 2010 or later). Available online at http://www.phac-aspc.gc.ca/std-mts/sti-its/
Materials & Resources	**Fact Sheet: Chlamydia**
Cross Reference	Not applicable

References

Alberta Health and Wellness. Alberta Treatment Guidelines for Sexually Transmitted Infections (STI) in Adolescents and Adults. 2012.

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at http://www.health.alberta.ca/professionals/notifiable-diseases-guide.html

Canadian Guidelines on Sexually Transmitted Infections. Available online at http://www.phac-aspc.gc.ca/std-mts/sti-its/

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Infectious Disease Protocols. Available online at http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on June 3, 2013.

6.3.1 Gonorrhea

Special Precautions/Considerations

Precautions
Routine

Reporting
Notifiable: Yes
Routine (within 7 days)

Infectious Agent	Bacteria: *Neisseria gonorrhoeae (N. gonorrhoeae).*

Clinical

Clinical Presentation

Gonorrhea infection is **asymptomatic in more than 50% of infections**.

Females	Males	Neonates & Infants
Vaginal discharge	Urethral discharge & itch	Conjunctivitis
Dysuria	Dysuria	
Abdominal pain	Testicular pain or swelling (epididymitis symptoms)	
Abnormal vaginal bleeding		Sepsis
Dyspareunia (painful intercourse)	Rectal pain and discharge if proctitis	
Rectal pain and discharge if proctitis		

Pharyngeal and anorectal infections can occur in those engaging in oral and anal sex but are more likely to be asymptomatic. If the infection is located in the pharynx the individual may experience a sore throat and difficulty swallowing. For anorectal infections, there may be pain and discharge. If untreated, the bacteria may cause infection of the joints, skin, heart and brain.

Major complications – Females	Major complications – Males
Pelvic inflammatory disease (PID)	Epididymo-orchitis
Chronic pelvic pain	
Ectopic pregnancy	
Infertility	Infertility (rare)
Reactive arthritis (Reiter syndrome)	Reactive arthritis (Reiter syndrome)
Disseminated gonococcal infection	Disseminated gonococcal infection

Diagnostics

A urine sample may be used for the diagnosis of genital gonorrhea except for pediatric cases. Consult with a physician for appropriate testing of pediatric cases.

Special considerations for urine specimen collection:

- Ideally, the patient should not have voided for at least 2 hours prior to specimen collection; however, having voided does not preclude testing.
- Have the patient collect the first 10 - 20 ml of urine (“first catch”).

Note that blood in the urine can produce false positive results.

The NAAT test currently used (as of 2018) is the Cobas 4800 from Roche.

A swab for gonorrhea culture is useful if antimicrobial resistance is suspected. Resistance results are not available with the urine test. If a pharyngeal or rectal swab is required, perform culture; however, note that since samples require lengthy transport in Nunavut the pathogen may not survive resulting in a false negative test. Results from culture should therefore be interpreted with caution.

Treatment

Refer to the *Canadian Guidelines on Sexually Transmitted Infections* (2013, update regarding resistance, and/or current) available at: http://www.phac-aspc.gc.ca/std-mts/sti-its/.

Treatment for gonorrhea is indicated for:

- Positive gonorrhea test;
- Diagnosis of a syndrome compatible with a gonorrhea infection, without waiting for test results;
- Diagnosis of gonorrhea infection in a sexual partner, or diagnosis of a syndrome compatible with gonorrhea infection without waiting for test results.

Note: All patients treated for gonorrhea should also be empirically treated for chlamydia, unless a chlamydia test result is available and negative.

Adults and youth (≥ 9 years of age)

Type	Preferred	Alternative**
Pharyngeal infection, MSM°	**Ceftriaxone** 250 mg IM in a single dose **PLUS Azithromycin** 1 g PO in a single dose	Azithromycin 2 g PO in a single dose **PLUS** Gentamicin¥ 240 mg IM in 2 separate 3-mL injections of 40 mg/mL solution
Uncomplicated anogenital infection (urethral, endocervical, vaginal, rectal)	**Ceftriaxone** 250 mg IM in a single dose **PLUS Azithromycin** 1 g PO in a single dose	Azithromycin 2 g PO in a single dose **PLUS** Gentamicin¥ 240 mg IM in 2 separate 3-mL injections of 40 mg/mL solution OR **Cefixime** 800 mg PO in a single dose **PLUS Azithromycin** 1 g PO in a single dose

°MSM = men who have sex with men

Additional notes:

- Available data suggests that Azithromycin is safe and effective in pregnant and lactating women. Azithromycin should not be used as monotherapy as resistance has been reported.
- *If patient has an allergy or sensitivity to azithromycin or macrolide antibiotics, use doxycycline 100 mg PO twice daily for 7 days instead of azithromycin
- ¥ Gentamicin 240 mg IV infused over 30 minutes may be considered as an alternative route of administration when the IM route is not feasible.
- **All patients treated with an alternative regimen should have a test of cure (from all positive sites) using a NAAT test 2-3 weeks after treatment.

Pathogen

Occurrence

Worldwide: Gonorrhea is a common reportable Sexually Transmitted Infection (STI) worldwide, second only in numbers to Chlamydia; an estimated 78 million

	cases are reported annually. **Canada:** Gonorrhea rates in Canada have increased by 65.4% between 2010 and 2015. The highest rates were among those 15-29 years of age. The national Gonorrhea rate in 2015 was 55.4 per 100,000. **Nunavut:** The rate of gonococcal infection has remained above the national average since reporting began in 1999. In 2013, the age-standardized rate was nearly 27 times higher than the rate for the rest of Canada. Gonorrhea was the second most frequently reported disease in Nunavut from 2007 to 2014; it accounted for about 25% of all STIs reported in the territory. Between 2007 and 2014 53% of the cases were female and 47% were male.
Reservoir	Humans.
Transmission	Transmission occurs by direct sexual contact via oral, vaginal, urethral, rectal or cervical routes. The bacteria may also spread from the primary sites, causing infection of the uterus (endometritis); the fallopian tubes (salpingitis); the abdominal cavity (peritonitis); the glands of the vulvar area (bartholinitis); and the testicles in men (epididymitis). Occasionally the infection can spread to infants if the mother is infected at the time of birth. Infection in the newborn usually involves the eye.
Incubation Period	Usually 2-7 days, sometimes longer.
Communicability	The infection is communicable for as long as the bacteria are present in the body, even if the individual is asymptomatic. Effective treatment ends communicability.
Susceptibility and Resistance	Susceptibility is universal and re-infection is common. Co-infection with *Chlamydia trachomatis* is common. The proportion of penicillin-resistant organisms is greater than 1% in most areas of Canada and may reach 15% or higher in certain areas. Also, the numbers of isolates resistant to tetracyclines or a combination of penicillin and tetracyclines are still high, thus use of these antimicrobial agents is not routinely recommended. Quinolone resistance of the isolates tested by the National Microbiology Laboratory in Canada has been steadily increasing, from 1% in the late 1990s to 15.7% in 2005. Quinolones should only be considered as an alternative treatment if (1) antimicrobial susceptibility testing is available OR (2) if a Test of Cure is done. At present antibiotic resistance in gonorrhea in Nunavut is unknown.
Public Health Management	
Case	• Contact and interview the case regarding sexual history. Cases should be interviewed for history of exposure, risk assessment, sexual partners and/or perinatal contact(s). • Complete the *Chlamydia and Gonorrhea Report Form* dated February 2018 or later (section 6.3.2).

	• Determine the presence or absence of symptoms.
	• Determine risk factors and counsel about transmission:
	  ▪ Sexual contact with person(s) with known infections or compatible syndrome;
	  ▪ Unprotected sexual contact with partner(s) originating from or following travel to an area with high endemicity for gonorrhea (note that drug resistance is more likely in this setting);
	  ▪ Multiple partners;
	  ▪ New sexual partner or more than 2 partners in the past year;
	  ▪ Previous STIs;
	  ▪ Vulnerable populations (e.g. injection drug users, incarcerated individuals, sex trade workers, street youth, etc.);
	  ▪ Men who have unprotected sex with other men;
	  ▪ Alcohol and drug use.
	• Identify all sexual partner(s) in the 60 days before treatment, symptom onset or specimen collection (if asymptomatic). Refer to the Contacts section below.
	• Counsel the case about the importance of abstaining from unprotected sexual contact until 7 days after treatment of both the case and partner(s).
	• Consider testing for other STIs (e.g. Chlamydia, Syphilis, HIV, Hepatitis B).
	• Consider immunization for Hepatitis B if not already immune.
	• If genital, rectal or oral infections are diagnosed in children and youth under the age of 16, sexual abuse must be considered. The clinician should consult with a physician for testing and determine whether there are reasonable and probable grounds to believe the child or youth is in need of protection. Under Section 8-1 of the Child and Family Services Act, a person who has information of the need of protection of a child shall, without delay, report the matter to a Child Protection Worker or if not available to a peace officer or an authorized person. Siblings and other children who may be at risk should also be screened.
	
	Test of Cure is recommended 2-3 weeks after completion of treatment in the following instances:
	1. The treatment agent used is not listed as the preferred treatment in this protocol.
	2. Patient is prepubertal.
	3. Patient is pregnant.
	4. Antimicrobial resistance is documented or suspected
	5. Uncertain or suboptimal compliance.
	6. Non-genital site is involved.
	7. Pelvic inflammatory disease (PID) or disseminated gonococcal infection.
	8. Persistent symptoms or signs post-treatment.
	9. Previous treatment failure for Gonorrhea.
	10. Re-exposure to an untreated partner.
	
	Re-test <u>all</u> individuals diagnosed with Gonorrhea after 6 months.

Contacts	Partner notification will identify those at risk, reduce infection transmission and/or re-infection and ultimately prevent infection sequelae. Every attempt should be made to identify, locate, examine and treat partners/contacts of all cases. • All contacts in the 60 days prior to symptom onset or date of specimen collection, regardless of signs or symptoms, must be located, tested and

	empirically treated regardless of clinical findings and without waiting for test results. • It may be necessary to extend this 60 day time period until sexual partner(s) are identified. • All contacts should be instructed about infection transmission. • Parents of infected neonates (e.g. mother and her sexual partner[s]) should be located, clinically evaluated and empirically treated per treatment section, regardless of clinical findings and without waiting for test results. • Complete the *STI Contact Investigation Form* dated September 2013 or later (section 6.3.3). Include additional pages for contact information as necessary.
Outbreaks	If a higher than normal amount of disease activity is detected, contact your RCDC.
Health Education	• Confidential STI testing should be made available in facilities where STIs may be more common (e.g., correctional facilities, drug treatment centers, family planning and prenatal clinics, STI clinics, establishments that offer services to MSM, homeless shelters, and group homes). • Health care providers should recommend to all STI cases and contacts that they be tested for HIV. • STI testing is recommended in all pregnant women. • Focus on methods to reduce high risk sexual behaviors that may lead to STIs (e.g., safer sex education, access to condoms). • School health programs should centre on basic and accurate information about STIs and safer sex.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine precautions.
Occupational Health	Gloves for direct contact with infected areas.
Surveillance	
Case Definition	**Confirmed case:** **1. Genital infection:** Laboratory evidence of infection in genitourinary specimens: • Detection of *N. gonorrhoeae* by culture **OR** • Detection of *N. gonorrhoeae* nucleic acid **2. Extra-genital infection:** Laboratory confirmation of infection from pharynx, rectum, joint, conjunctiva, blood and other extra-genital sites: • Detection of *N. gonorrhoeae* by culture **OR** • Detection of *N. gonorrhoeae* nucleic acid **3. Perinatally acquired infection:** Laboratory confirmation of infection from a neonate in the first four weeks of life leading to the diagnosis of gonococcal conjunctivitis, scalp abscess, vaginitis, bacteremia, arthritis, meningitis or endocarditis: • Detection of *N. gonorrhoeae* by culture **OR**

	• Detection of *N. gonorrhoeae* nucleic acid
Reporting Requirements and Forms	**Gonorrhea is a notifiable infection in Nunavut:** 1. Complete the *Chlamydia and Gonorrhea Report Form* dated February 2018 or later (section 6.3.2) and *STI Contact Investigation Form* dated September 2013 or later (section 6.3.3). 2. Fax the forms, within 7 days of case notification, to the RCDC as follows: • Qikiqtaaluk: 867-975-4833 • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272

Tools

Guidelines	Alberta Treatment Guidelines for Sexually Transmitted Infections in Adolescents and Adults (last updated 2017). Older (2012) version available online at http://www.health.alberta.ca/documents/STI-Treatment-Guidelines-2012.pdf%20 Canadian Guidelines on Sexually Transmitted Infections (January 2010 or later). Available online at http://www.phac-aspc.gc.ca/std-mts/sti-its/
Materials & Resources	Fact Sheet: Gonorrhea
Cross Reference	Not applicable

References

Alberta Health and Wellness. Alberta Treatment Guidelines for Sexually Transmitted Infections (STI) in Adolescents and Adults. 2017.

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at http://www.health.alberta.ca/professionals/notifiable-diseases-guide.html

Canadian Guidelines on Sexually Transmitted Infections. Available online at http://www.phac-aspc.gc.ca/std-mts/sti-its/

Choudhri Y, Miller J, Sandhu J, Leon A, Aho J. Gonorrhea in Canada, 2010-2015. Canadian Communicable Disease Report. 2018;44(2):37-42. https://doi.org/10.14745/ccdr.v44i02a01

Treatment of N. gonorrhoeae in response to the discontinuation of spectinomycin: Alternative treatment guidance statement. Available online at https://www.canada.ca/en/public-health/services/publications/diseases-conditions/gonorrhea-alternate-treatment.html

Government of Nunavut. Reportable Communicable Diseases in Nunavut, 2007 to 2014. Available online at https://gov.nu.ca/sites/default/files/reportable_communicable_diseases_in_nunavut_2007_to_2014.pdf

Heymann, D. L. (Ed.) (2015). Control of Communicable Diseases Manual. 20th Edition. American Public Health Association.

Ontario Infectious Disease Protocols. Available online at http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

World Health Organization. Sexually Transmitted Infections (STIs) Fact Sheet (updated August 2016). Available online at http://www.who.int/mediacentre/factsheets/fs110/en/

Approval

Approved by Dr. Kim Barker Medical Officer of Health on April 15, 2018.

Nunavut Communicable Disease and Surveillance Manual:
6.4 Syphilis

Contents

6.4.1 Syphilis

Special Precautions/Considerations

Precautions: Routine
* if in contact with lesions use contact precautions

Reporting
Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	*Treponema pallidum* (*T. pallidum*), a bacterium of the order spirochaeta.
Pathogen	
Occurrence	**Worldwide:** In developed countries, syphilis is usually more prevalent in urban than rural areas and in some cultures, in males more than in females. **Canada:** After some decline in the late 1970s and early 1980s, incidence has increased again in Canada in recent years. **Nunavut**: Prior to 2008 the rate in Nunavut was consistently lower than the national average. After 2008 the Nunavut rate has been inconsistent but has generally trended up, with a rate of 12 per 100,000 in 2011. A syphilis outbreak was declared in 2012.
Reservoir	Humans.
Transmission	• The primary mode of transmission is vaginal, anal, and oral sexual contact (direct contact with infectious exudates from obvious or concealed moist, early lesions of skin, and with mucous membranes of infected people during sexual contact). • Kissing, sharing of needles and injection equipment may result in transmission. • Blood transfusion, accidental inoculation (e.g. needle stick injury) and solid organ transplantation have rarely been reported as routes of transmission; note that all blood and organs used for donation in Canada are tested for syphilis. • The majority of infants with congenital syphilis are infected in utero, but they can also rarely be infected by contact with an active genital lesion during delivery. Breastfeeding does not result in syphilis transmission to the child unless an infectious lesion is present on the breast.
Incubation Period	Dependent upon stage; see Table 1 in Clinical Management (Staging) section.
Communicability	Communicability exists when moist mucocutaneous lesions of primary and secondary syphilis are present.
Susceptibility and Resistance	Universal susceptibility to initial infection and re-infection; approximately 30% of exposures result in infection. Concurrent HIV infection may alter the presentation and response to treatment of syphilis.
Screening/Who to Test	
Who to test for syphilis	The following person(s) should be tested for syphilis: • Anyone requesting a sexually transmitted infection (STI) screen. • Individual with signs/symptoms of syphilis. • Sexual contact of a known case of syphilis.

	• Men who have sex with men (MSM). • Those with multiple sex partners. • Those with a history of syphilis, HIV and other STIs. • Incarcerated persons. • Exchange of sex for food, money, shelter, etc. • Those who are under-housed/have unstable housing. • Injection drug users. • Pregnant women.* **NOTES:** • *All pregnant women MUST be screened in the first trimester (initial pregnancy screening), at 24-28 weeks, and near term (35-37 weeks) or at delivery. If the pregnant woman and/or her partner are at risk of becoming infected or re-infected during pregnancy, RPR may be repeated as often as monthly and at delivery. • Some programs routinely screen individuals for syphilis upon entry to the program or facility, e.g. foster care, elderly with new onset dementia.
Clinical Management	
Diagnosis	The diagnosis of syphilis is made on a combination of **history, signs, symptoms, past history of syphilis and/or treatment for syphilis as well as the results of direct (e.g. polymerase chain reaction (PCR)), serologic tests for syphilis and if indicated and performed, results of cerebrospinal fluid tests.** The Health Care Provider assessing the client must work within their scope of practice. Additional consultation and referral is recommended for: • pregnant women. • children < 16 years of age. • immunocompromised (e.g. HIV positive). • any client with neurological or ocular symptoms *(See Appendix 1: Screening Questions for Neurosyphilis (including Ocular and Otosyphilis)*
History, Review of Signs/Symptoms and Management Considerations	**ALL CASES:** • For all persons with reactive syphilis serology, check Meditech and/or contact RCDC to determine if prior history of syphilis diagnosis and treatment. • Contact and interview the case. • Determine the presence or absence of symptoms and/or signs, including the presence or absence of neurological symptoms (*See Appendix 1*). • Physical examination is required to determine the presence of signs of syphilis.

	• If the individual was tested for syphilis in another province/ territory, the tests should be repeated after return to Nunavut to provide a new baseline for follow up. • Complete the *Syphilis Report Form* dated October 2018 or later (section 6.4.2). ***Record any risk factors for syphilis (See Box 1.6 on Syphilis Assessment Report Form):*** • Exchange of sex for money/drugs • Been in jail/juvenile detention • Men who have sex with men • Sex without a condom • Multiple sex partners • History of other STI • Under-housed/unstable housing • Use of alcohol • Use of drugs ***Screen for concurrent STIs:*** obtain specimens for HIV, gonorrhea and chlamydia. ***Determine immunization status*** for human papilloma virus (HPV) and hepatitis B. • HPV vaccine is publicly funded as outlined in the Nunavut Immunization Catch-up Aid for Children Up to 18 Years of Age • Determine hepatitis B immunization status. Hepatitis B vaccine may be offered opportunistically to all susceptible (non-immune) Nunavummiut at risk of contracting STIs. Hepatitis B surface antibody levels should be collected if immunization status unknown. ***Obtain point of care pregnancy test, if applicable.*** ***Counsel and identify partners, including locating information.*** ***Provide Risk Reduction Counselling:*** • All cases should be provided with individualized STI prevention education, targeted at developing knowledge, skills, attitudes and behaviours to reduce the risk and prevent recurrences of STIs. (For an example of risk reduction counselling, see pages 149-151 of the **Alberta Blue Book Standards for the Management and Standards of STI Clinic Clients**) ***Educate the case about the following:*** • Return to the health care provider if symptoms have not resolved in 2 to 4 weeks; • Having a current syphilis infection increases the likelihood of becoming

infected with HIV;
- Having syphilis once does not prevent the possibility of future infections;
- Complications of untreated syphilis (e.g. neurological system involvement, etc.);
- Transmission and the asymptomatic nature of the infection;
- The importance of partner notification and the process;
- Safer sex practices including the use of barrier methods;
- The need for blood work follow-up to monitor the response to treatment;
- That future serology (syphilis EIA, TPPA) for syphilis will be positive and that it is important to inform all health care providers of previous history of syphilis.

PREGNANT WOMEN:

Pregnant women ≥ 20 weeks gestation should have an ultrasound to assess for fetal abnormalities prior to treatment. An ultrasound to determine gestational age should also be done prior to treatment in women who are of unknown gestation.

With prior history of syphilis:
- Check Meditech and/or consult with Regional Communicable Disease Coordinator (RCDC) for details of prior history of syphilis.
- Await assessment of case details by Territorial Syphilis Consultant (TSC) prior to initiating further treatment.
- For women deemed to be previously adequately treated without evidence of re-infection, no further treatment is required.
- ***Prenatal Syphilis Plan of Care Letter*** to be developed by the TSC and sent to all providers and/or discharge coordinator involved in woman's pregnancy and delivery and to pediatrician(s) who will be involved in infants' care. RCDC to determine to whom letters should be sent to facilitate smooth transfer of information and care.

Late latent syphilis, regardless of gestation:
- Proceed with treatment.
- No risk of Jarsich-Herxheimer reaction with treatment for late stage syphilis.
- ***Prenatal Syphilis Plan of Care Letter*** to be developed by the TSC and sent to all providers and/or discharge coordinator involved in woman's pregnancy and delivery and to pediatrician(s) who will be involved in infants' care. RCDC to determine to whom letters should be sent to facilitate smooth transfer of information and care.
- ***Syphilis Report Form for Infants*** to be sent with ***Prenatal Syphilis Plan of Care Letter.***

< 20 weeks gestation with infectious syphilis (primary, secondary, early latent):
- Proceed with treatment.

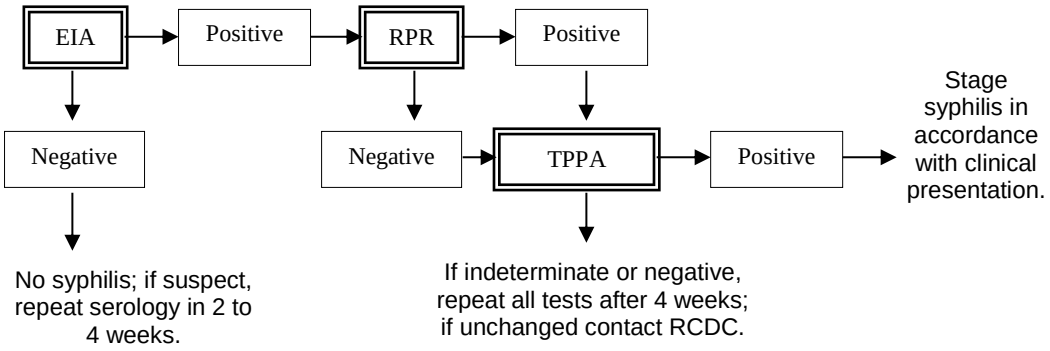
	• Inform RCDC of case. • ***Prenatal Syphilis Plan of Care Letter*** to be developed by the TSC and sent to all providers and/or discharge coordinator involved in woman's pregnancy and delivery and to pediatrician(s) who will be involved in infants' care. RCDC to determine to whom letters should be sent to facilitate smooth transfer of information and care. • ***Syphilis Report Form for Infants*** to be sent with ***Prenatal Syphilis Plan of Care Letter.*** ***≥ 20 weeks gestation or gestation unknown with infectious syphilis (primary, secondary, early latent):*** • Consult RCDC prior to treatment; RCDC will liaise with TSC/TCDC; if not available, consult regional specialist (Infectious Disease, Pediatrician, and/or Obstetrician) prior to treatment. • A detailed fetal ultrasound considered a requirement to assess for fetal abnormalities related to syphilis and should be arranged by provider. • Treatment of infectious syphilis in pregnancy may precipitate a **Jarisch-Herxheimer reaction** which may cause fetal distress or premature labour; therefore all patients >20 weeks gestation should undergo fetal monitoring for 12-24 hours after administration of benzathine penicillin. (see *Canadian Guidelines on STIs* (https://www.canada.ca/en/public-health/services/infectious-diseases/sexual-health-sexually-transmitted-infections/canadian-guidelines/sexually-transmitted-infections/canadian-guidelines-sexually-transmitted-infections-27.html). • If sufficient time prior to delivery, ***Prenatal Syphilis Plan of Care Letter*** to be developed by the TSC and sent to all providers and/or discharge coordinator involved in woman's pregnancy and delivery and to pediatrician(s) who will be involved in infants' care. RCDC to determine to whom letters should be sent to facilitate smooth transfer of information and care. • ***Syphilis Report Form for Infants*** to be sent with ***Prenatal Syphilis Plan of Care Letter.*** **CHILDREN AGED 2-16 YEARS:** • If syphilis is diagnosed in children and youth under the age of 16, sexual abuse must be suspected. • The clinician should consult (if not already done) with a physician for testing and determine whether there are reasonable and probable grounds to believe the child or youth is in need of protection. Under Section 8-1 of the Child and Family Services Act, a person who has information of the need of protection of a child shall, without delay, report the matter to a Child Protection Worker or if not available to a peace officer or an authorized person. Child and Family Services Act available online at: https://gov.nu.ca/sites/default/files/child_and_family_services_act.pdf **CHILDREN UNDER 2 YEARS OF AGE:**

	• Clinical and serologic follow up of the infant is dependent on maternal stage of syphilis, timing and type of treatment during pregnancy, maternal response (RPR) to treatment and clinical and laboratory tests on the infant at birth.
Physical Examination	Detailed examination techniques are provided in the **Alberta Blue Book Standards for the Management and Standards of STI Clinic Clients**. The following provides some key points involving physical examination in adolescents/adults: • Verbal consent must be obtained for the physical examination. • Privacy is essential. • Provide chaperone or assistant when requested by client. • Clinician should at all times maintain a non-judgmental position. • Explain all procedures and tests to the client; recognize the client has the right to refuse. • Mouth and pharyngeal examination if history warrants, e.g. client report of oral lesions. • Inspection of the skin and pubic hair. • Palpation for lymphadenopathy. • Examination of external genitalia; speculum examination is not routinely indicated in females. • Perianal inspection if history warrants, e.g. anal sex.
Laboratory Tests	Both **direct tests** and **serologic tests** are available for the diagnosis of syphilis. **Serologic testing** is the current standard for syphilis diagnosis; **direct tests** may be collected from lesions of syphilis (if present). Cerebrospinal fluid (CSF) tests are only performed if indicated (see below) **Serology** The interpretation of **serologic tests** is difficult and should be made in conjunction with a colleague experienced in the management of syphilis (see Table 2 in the Syphilis Chapter of the Canadian Guidelines on Sexually Transmitted Infections, available online at https://www.canada.ca/en/public-health/services/infectious-diseases/sexual-health-sexually-transmitted-infections/canadian-guidelines/sexually-transmitted-infections/canadian-guidelines-sexually-transmitted-infections-27.html#table-2). In Nunavut, serologic testing uses a reverse sequence algorithm (see Figure 1 below), which includes three serologic tests: 1. **Syphilis enzyme immunoassay (EIA).** The EIA is an initial screening test. If the EIA is positive, the following 2 tests will be completed by the lab (with

the original sample).

2. **Rapid Plasma Reagin (RPR).** The RPR is a measure of disease activity, and is used to follow the response to treatment and to assess for re-infection.
3. ***Treponema pallidum* particle agglutination (TPPA).** The TPPA is used for confirmatory testing. If positive, it is not repeated in individuals over the age of 2 years.

Figure 1: Sequence of Syphilis Serology Testing



Several conditions can result in false positive reactions of one or more syphilis tests, including pregnancy, persons from endemic countries infected with other treponemes such as yaws, pinta and bejel, etc.

Notes:

- Syphilis testing is available in Nunavut through the regional laboratory route.
- The laboratory requisition or Meditech entry should be completed with the patient name, date of birth and HCP number. Syphilis testing should be indicated on the requisition.
- Use the gold-topped tube for blood (serum) collection. The specimen should be refrigerated and transported to the laboratory in accordance with standard practice guidelines.

DURATION OF SEROLOGIC RESPONSE

- **In individuals over the age of 2 years, the EIA and TPPA typically remain positive for life, while the RPR typically declines to a low level and may revert to non-reactive. Sero-fast refers to a <4-fold (2 dilution) decline in RPR titers at 6–12 months or as persistently low titers after treatment.**

- **Infants under the age of 2 years usually have passively transferred maternal antibodies. The non treponemal tests (e.g. RPR) usually sero-revert by 6 months of age and the treponemal tests (syphilis EIA, TPPA) by 15- 18 months of age.**

Direct test (Swab) for polymerase chain reaction (PCR)

- If the patient has lesions suspicious for primary (chancre) or secondary (condyloma lata), swab lesion and place swab in Universal Transport Media (UTM) and indicate "suspect syphilis" on the laboratory requisition. Note that if a specimen is being collected for herpes simplex virus, a second sample will need to be collected.
- The specimen for syphilis PCR will be submitted to the National Microbiology Laboratory. This anticipated turnaround time for this test result is several weeks. Patient treatment and follow up should not be delayed while awaiting the results. The result will ultimately be used to accurately stage the case as well as for surveillance purposes.
- **A serology specimen must also be collected**

Tests from cerebrospinal fluid

- In patients with suspected/confirmed syphilis, a lumbar puncture for collection of cerebrospinal fluid (CSF) is recommended. Criteria for CSF examination include:
    - Presence of neurologic, ophthalmic or otic (ear) symptoms
    - Congenital syphilis
    - Previously treated patients who fail to achieve an adequate serologic response to treatment
    - Tertiary syphilis
- CSF should be tested for cell count and differential, protein, VDRL and/or FTA-ABS.
- CSF VDRL is highly specific and confirms a diagnosis of neurosyphilis. However, it is not very sensitive and may be negative in cases of neurosyphiis.
- CSF FTA-ABS is very sensitive but non-specific for the diagnosis of neurosyphilis; a negative CSF FTA-ABS helps to exclude a diagnosis of neurosyphilis.
- The diagnosis of neurosyphilis is usually made on a combination of reactive syphilis serologic tests, abnormalities of CSF cell count or protein or a reactive CSF VDRL with or without clinical manifestations.

Staging

Syphilis is classified into stages that reflect the degree of infectivity* and progression of the disease (see Table 1 below).

Table 1: Syphilis Stages

Stage	Incubation period	Clinical manifestations
Primary*	3 weeks (3 to 90 days)	Chancre, regional lymphadenopathy

	Secondary*	2 to 12 weeks (2 weeks to 6 months)	Rash, fever, malaise, lymphadenopathy, mucus lesions, condyloma lata, patchy or diffuse alopecia, meningitis, headaches, uveitis, retinitis
	Latent	Early*: < 1 year Late: ≥ 1 year	Asymptomatic
	Tertiary:		
	Cardiovascular syphilis	10 to 30 years	Aortic aneurysm, aortic regurgitation, coronary artery ostial stenosis
	Neurosyphilis*	<2 years to 20 years	Ranges from asymptomatic to symptomatic with headaches, vertigo, personality changes, dementia, ataxia, presence of Argyll Robertson pupil
	Gumma	1 - 46 years (most cases 15 years)	Tissue destruction of any organ; manifestations depend on site involved
	Congenital:		
	Early	Onset <2 years	2/3 may be asymptomatic; fulminant disseminated infection, mucocutaneous lesions, osteochondritis, anemia, hepatosplenomegaly, neurosyphilis
	Late	Persistence >2 years after birth	Interstitial keratitis, lymphadenopathy, hepatosplenomegaly, bone involvement, anemia, Hutchinson's teeth, neurosyphilis

* infectious (including neurosyphilis < 1 year after infection)

Treatment

Treatment varies with Syphilis stage. The following guidelines are based on *Canadian Guidelines for Sexually Transmitted Infections, available at:*

https://www.canada.ca/en/public-health/services/infectious-diseases/sexual-health-sexually-transmitted-infections/canadian-guidelines/sexually-transmitted-infections/canadian-guidelines-sexually-transmitted-infections-27.html

Table 2: Syphilis Treatment

Syphilis Stage	Preferred Treatment	Dose	Alternate Treatment (only for penicillin

				allergic patients)
	All non-pregnant, Adults/Adolescents Primary, Secondary, Early Latent (< 1-year duration)	Long-acting Benzathine penicillin G (Bicillin-LA)*	2.4 MU comprised of 2 separate injections of 1.2 MU each. Ventral or Dorsal gluteal IM. **One treatment only.**	Doxycycline 100mg po BID for 14 days
	All non-pregnant, Adults Late Latent (>1 year after infection or unknown duration) Cardiovascular syphilis	Long-acting Benzathine penicillin G (Bicillin-LA)*	2.4 MU comprised of 2 separate injections of 1.2 MU each. Ventral or Dorsal gluteal IM. **Repeat dose weekly for 3 doses.**	Doxycycline 100mg po BID for 28 days
	Pregnant Primary, Secondary, Early Latent or Latent syphilis of unknown duration	**< 20 weeks gestation:** Proceed with treatment below and inform RCDC; RCDC will liaise with Territorial Communicable Disease Consultant (TCDC)/Territorial Syphilis Consultant (TSC) **≥ 20 weeks gestation or gestational age unknown:** Consult with RCDC prior to treatment; RCDC will liaise with TCDC/TSC; if not available, consult regional specialist (Infectious Disease, Pediatrician, and/or Obstetrician) prior to treatment.		
		Long-acting Benzathine penicillin G (Bicillin-LA)*	2.4 MU comprised of 2 separate injections of 1.2 MU each. Ventral or Dorsal gluteal IM. **Repeat dose weekly for 2 doses.**	See below‡
	Pregnant Late Latent (>1 year after infection)	Proceed with treatment (regardless of gestational age) and inform RCDC		
		Long-acting Benzathine penicillin G (Bicillin-	2.4 MU comprised of 2 separate injections of 1.2 MU each. Ventral or Dorsal gluteal IM. **Repeat dose weekly for**	See below‡

	LA)*	**3 doses.**	
Sexual Contacts of primary, secondary and early latent cases	Long-acting Benzathine penicillin G (Bicillin-LA)*:	2.4 MU comprised of 2 separate injections of 1.2 MU each. Ventral or Dorsal gluteal IM. **One treatment only.**	Doxycycline 100mg po BID for 14 days
Sexual Contacts of late latent cases	Contacts (sexual, perinatal) should be tested for syphilis and if positive, treated based on syphilis stage		
Neurosyphilis (including ocular/ear involvement	Consultation with a specialist (Infectious Disease, Pediatrician and/or Obstetrician) recommended prior to treatment. **Preferred treatment:** Penicillin G 3-4 million units IV q 4 h for 10-14 days **Alternative treatment (penicillin-allergic patients):** • Strongly consider penicillin desensitization followed by treatment with penicillin • Ceftriaxone 2gm IV/IM x 10-14 days		
Congenital syphilis	If congenital syphilis is suspected based on mother's serologic tests or concerning symptoms in infant, consult with a pediatric infectious diseases specialist regarding further work up which may include long bone x-rays, lumbar puncture and other investigations. For details, refer to Canadian Pediatric Statement on Congenital Syphilis and Canadian STI Guidelines Syphilis Chapter		

PRACTICE NOTE:

- ***Recommended treatment is with benzathine penicillin G- long acting (Bicillin® L-A)**
- **Each vial of Bicillin® L-A is 1.2 mu**
- **The dose of 2.4 mu must be split into 2 separate syringes, with 2 injections into separate gluteal muscle sites.**
- **Note that short-acting benzylpenicillin (penicillin G Sodium) (IM or IV), is *NOT* adequate for treating syphilis.**

‡Doxycycline is not recommended during pregnancy. Therefore, there is no satisfactory alternative to penicillin in pregnancy. Penicillin allergic pregnant women should be considered for desensitization followed by treatment with benzathine penicillin.

Note: This document does not present all available treatment options; for scenarios not presented above or for alternative treatments for penicillin-allergic patients refer to the *Canadian Guidelines on STIs* (https://www.canada.ca/en/public-health/services/infectious-diseases/sexual-health-sexually-transmitted-infections/canadian-guidelines/sexually-transmitted-infections/canadian-guidelines-sexually-transmitted-infections-27.html

Serologic Follow Up

The clinical provider is responsible for coordinating serologic follow up for the patient with assistance upon mutual agreement with public health staff.

INDIVIDUALS > 2 YEARS OF AGE

- Serology (RPR alone in persons > 2 years of age) is monitored until the client is seronegative or at a stable (usually) low titre (e.g. 1:4 dilutions or lower).
- If the RPR remains at ≥ 1:32 dilutions at the end of the follow up period, consult with RCDC who will liaise with TCDC/TSC regarding the need for further investigations and follow up.
- The intervals and length of time for follow-up are determined by the stage of infection (Table 3).

Table 3: Serologic Follow Up

Syphilis Stage	Serology Follow-up Periods
Primary, Secondary, Early Latent	1, 3, 6 and 12 months after treatment. HIV serology should be done at baseline, and 1 and 3 months.
Late Latent, Tertiary (**except** Neurosyphilis)	12 and 24 months after treatment
Neurosyphilis	6, 12 and 24 months after treatment. Refer to the *Canadian Guidelines on STIs* (January 2010 or later) for greater detail.
HIV-infected (any stage)	1, 3, 6, 12 and 24 months after treatment and yearly thereafter.
Pregnant women	See Case Management above
Babies born to mothers with reactive Syphilis serology	See Case Management above

Consult with the RCDC for questions regarding interpretation of follow-up serology. Submit post-treatment RPR results and follow-up HIV results to the RCDC.

Serologic decline in RPR:

No serologic follow up required if baseline RPR is non-reactive. Serologic decline

(fall in the RPR titre) varies. Table 4 is provided as a guide but some individuals may decline slower or faster than described in the Table. Consult with RCDC for all RPR titres ≥ 1:32 dilutions at the end of the follow up period.

Table 4: Adequate Serologic Response (decline in quantitative RPR titre)

Primary	4-fold* drop at 6 months, 8-fold drop at 12 months
Secondary	8-fold drop at 6 months and 16-fold drop at 12 months
Early latent	4-fold drop at 12 months

*4-fold drop is equivalent to a 2-tube drop (e.g. change from 1:32 dilutions to 1:8 dilutions).

HIV TESTING

- Syphilis increases the risk of acquisition and transmission of syphilis.
- All patients with a new diagnosis of syphilis should have baseline HIV testing.
- Patients with infectious syphilis (primary, secondary, early latent) should have HIV testing repeated at 1 and 3 months after diagnosis.

CHILDREN < 2 YEARS OF AGE

- All three syphilis tests (syphilis EIA, RPR and TPPA) should be performed in children under the age of 2 years. If the infant was being tested in another province/territory, the tests should be repeated after return to Nunavut to provide a new baseline for follow up.
- Infants born to mothers with positive syphilis serology will have passively transferred antibodies until the age of 15-18 months, therefore minimum serologic follow up is at birth, 6 months and 15-18 months of age.
- Non-treponemal tests (e.g. RPR) will typically sero-revert (become non-reactive) by 6 months of age and the treponemal tests (syphilis EIA, TPPA) by 15- 18 months of age.
- Persistently positive tests beyond 18 months of age are indicative of congenital syphilis and require a referral to a pediatrician if one is not already involved.

Infants born to mothers with positive syphilis serology who are adequately treated prior to pregnancy:

- Clinical or serologic follow up of infant is not required unless it is suspected that the mother may have acquired syphilis during the current pregnancy.
- If serologic follow up is desired to ensure clearance of passively transferred antibodies, serology (syphilis EIA, RPR and TPPA) should be collected from the infant at birth, repeated at 6 months of age and if any serologic test remains positive at that time, repeated at 15-18 months of age.

Infants born to mothers diagnosed and treated for late latent syphilis during pregnancy:

- Serology (syphilis EIA, RPR, TPPA) should be collected from the infant at birth, repeated at 6 months of age and if any serologic test remains positive at that

time, repeated at 15-18 months of age.

Infants born to mothers treated for infectious syphilis:

- Clinical and serologic follow up of infant required; to be based on recommendation of pediatrician/pediatric infectious disease specialist.
- Minimum serologic follow up is at birth, 6 months of age and if any serologic test remains positive at that time, repeated at 15-18 months of age.

Contact Notification

Traceback period and treatment of contacts

Traceback period:

The traceback period for sexual partner follow-up is determined by the stage of syphilis. All sexual and perinatal contacts within the time periods indicated in the Contact Tracing Period table (below) must be identified and located. Contacts should be tested and treated in the same visit without awaiting laboratory results*.

If laboratory results are negative, no post-treatment serologic follow-up is needed. If laboratory results are positive, follow the same serologic follow-up and partner notification procedures as for cases.

Table 5: Contact Tracing Period

Syphilis stage	Trace-back period**
Primary	3 months
Secondary	6 months
Early latent	1 year
Late latent/Tertiary	Assess marital or other long-term partners and children as appropriate; the decision to test these contacts depends on estimated duration of infection in the source case.
Congenital	Assess/consult with RCDC
Stage undetermined	Assess/consult with RCDC.

****Trace-back period refers to the time period prior to symptom onset or date of specimen collection (if asymptomatic).

Partner counseling and referral for syphilis cases must be completed. Complete the ***STI Contact Investigation Form*** dated October 2018 or later (section 6.4.4). Include additional pages for contact information as necessary.

Management of contacts:

Primary, Secondary or Early Latent Syphilis

- Assess all sexual contacts of a client diagnosed with primary, secondary, or early latent Syphilis (see table in Treatment section), perform:
  - Syphilis serology;
  - Routine sexual health history;

	▪ Physical exam; and ▪ STI screening including HIV serology. • Prophylactically treat all contacts of primary Syphilis cases prior to receipt of serology. • Prophylactically treat all contacts of secondary or early latent Syphilis cases within the prior twelve months before receipt of serology. • Complete the ***Syphilis Report Form*** dated October 2018 or later (section 6.4.2). **Note**: Contacts that are prophylactically treated should not be interviewed on their contacts before confirmation that they have infectious syphilis. **Late Latent Syphilis** • Treat only those contacts with reactive syphilis serology. • Perform routine sexual health history, exam, and STI screening including HIV serology. • Syphilis serology is required for all current and ongoing sexual contacts. • If the client is female, syphilis serology is required for children. ▪ Syphilis serology requisition includes both syphilis screening and confirmatory tests.
Outbreaks	If a higher than normal amount of disease activity is detected, contact your RCDC.
Health Education	Under development.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine precautions. If in contact with lesions use contact precautions.
Occupational Health	Routine. If in contact with lesions use contact precautions.
Surveillance	
Case Definition	**1. Confirmed case – Early congenital Syphilis (within 2 years of birth)** Laboratory confirmation of infection: • Identification of *T. pallidum* by dark-field microscopy, fluorescent antibody or equivalent examination of material from nasal discharges, skin lesions, placenta, umbilical cord or autopsy material of a neonate (up to four weeks of age) **OR** • Reactive serology (non-treponemal and treponemal) from venous blood (not cord blood) in an infant/child with clinical, laboratory or radiographic evidence of congenital syphilis[1] whose mother is without documented evidence of adequate treatment **OR** • Detection of *T. pallidum* DNA in an appropriate clinical specimen

Probable Case - Early Congenital Syphilis (within 2 years of birth)

• Reactive serology (non-treponemal and treponemal) from venous blood (not cord blood) in an infant/child without clinical, nor laboratory, nor radiographic evidence of congenital syphilis whose mother had untreated or inadequately treated syphilis at delivery.

Syphilitic Stillbirth

• A fetal death that occurs after 20 weeks gestation where the mother had untreated or inadequately treated infectious syphilis at delivery with no other cause of stillbirth established.

[1] Includes any evidence of congenital syphilis on physical examination (e.g. hepatosplenomegaly), evidence of congenital syphilis on radiographs of long bones, a reactive CSF VDRL, an elevated CSF cell count or protein without other cause.

2. Confirmed case – Primary Syphilis

Laboratory confirmation of infection:

- Identification of *T. pallidum* by dark-field microscopy, fluorescent antibody, nucleic acid testing, or equivalent examination of material from a chancre or a regional lymph node **OR**
- Presence of one or more typical lesions (chancres) and reactive treponemal serology, regardless of non-treponemal test reactivity, in individuals with no previous history of syphilis **OR**
- Presence of one or more typical lesions (chancres) and a fourfold or greater increase in the titre over the last known non-treponemal test in individuals with a past history of Syphilis treatment

3. Confirmed case – Secondary Syphilis

Laboratory evidence of infection:

- Identification of *T. pallidum* by dark-field microscopy, fluorescent antibody, nucleic acid testing or equivalent examination of mucocutaneous lesions, condylomata lata and reactive serology (non-treponemal and treponemal) **OR**
- Presence of typical signs or symptoms of secondary syphilis (e.g. mucocutaneous lesions, alopecia, loss of eyelashes and lateral third of eyebrows, iritis, generalized lymphadenopathy, fever, malaise or splenomegaly) AND either a reactive serology (non-treponemal and treponemal OR a fourfold or greater increase in titre over the previous known non-treponemal test

4. Confirmed case – Early Latent Syphilis (<1 year after infection)

Laboratory confirmation of infection:

- An asymptomatic patient with reactive serology (treponemal and/or nontreponemal) who, within the previous 12 months, had one of the following:

	○ Non-reactive serology ○ Symptoms suggestive of primary or secondary syphilis ○ Exposure to a sexual partner with primary, secondary or early latent Syphilis **5. Confirmed case – Late Latent Syphilis (>1 year after infection or unknown duration)** Laboratory confirmation of infection: • An asymptomatic patient with persistently reactive treponemal serology (regardless of non-treponemal serology reactivity) who does not meet the criteria for early latent disease and has not been previously treated for Syphilis **6. Confirmed case – Neurosyphilis** **a) Infectious (<1 year after infection)** Laboratory confirmation of infection: • Fits the criteria in 2, 3 OR 4 above AND one of the following: ▪ Reactive CSF-VDRL in non-bloody cerebrospinal fluid (CSF) ▪ Clinical evidence of neurosyphilis AND either elevated CSF leukocytes OR elevated CSF protein in the absence of other known causes **b) Non-infectious (>1 year after infection)** Laboratory confirmation of infection: • Reactive treponemal serology (regardless of non-treponemal serology reactivity) AND one of the following: ▪ Reactive CSF-VDRL in non-bloody CSF ▪ Clinical evidence of neurosyphilis AND either elevated CSF leukocytes OR elevated CSF protein in the absence of other known causes **7. Confirmed case – Tertiary Syphilis other than Neurosyphilis** Laboratory confirmation of infection: • Reactive treponemal serology (regardless of non-treponemal test reactivity) together with characteristic late abnormalities of the cardiovascular system, bone, skin or other structures, in the absence of other known causes of these abnormalities (*T. pallidum* is rarely seen in these lesions although, when present, it is diagnostic) AND • No clinical or laboratory evidence of neurosyphilis
Reporting Requirements/ Procedures and Forms	**SUBMISSION OF FORMS:** • **Syphilis is a notifiable infection in Nunavut; submission of forms is required under the Nunavut Public Health Act.** • Fax the forms, within 24 hours of case notification, to the RCDC as follows: • Qikiqtaaluk: 867-975-4833 • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-2409

CASES:

Table 6: Health Care Provider	
Suspect* and Confirmed Cases	1. Provide treatment as soon as possible after diagnosis (ideally within 1 business day). 2. Obtain list of *Contacts* at time of treatment. 3. Complete the *Syphilis Report Form* dated October 2018 or later (section 6.4.2) and *STI Contact Investigation Form* dated October 2018 or later (section 6.4.4) and submit to the RCDC (within 1 business day). 4. After completion of treatment, submit the first follow-up serology report (RPR and HIV) [See Table 3] to the RCDC.
Infants born to mothers with positive syphilis serology	1. Provide assessment and treatment if indicated. 2. Complete *Syphilis Report Form for Infants* (section 6.4.3) and submit to RCDC (ideally within 1 week of birth). 3. Submit follow up serology to RCDC.

Table 7: Regional Communicable Disease Coordinators (RCDCs)	
Suspect* and Confirmed Case	1. Obtain weekly update from the appropriate health care provider(s) treating the *Case* until adequate treatment is completed (based on follow-up serology report). 2. Monitor serology until end of follow up period to assess for appropriate decline following treatment. 3. Send completed *Syphilis Report* and *STI Contact Investigation Forms* to TCDC (within one of week of completion of treatment). 4. Send completed *Syphilis Report Form for Infants* within 1 week of delivery. 5. Confirm surveillance staging and follow up plan for all suspect and confirmed cases with TSC/TCDC within 1 month of receipt of forms.

* A suspect case does not yet meet the case definition for syphilis (e.g. a patient presenting with symptoms of syphilis, awaiting serologic confirmation of syphilis, and has not been named as a contact of a known case).

CONTACTS:

Contact notification is to be done by health care providers in conjunction with public health.

Table 8: Contact Management for Health Care Providers

1. Notify the *Contact* in the most appropriate manner (phone, text message, or home visit with appointment card and Contact Notification Letter 1 (section 6.4.7) to come to the clinic as soon as possible (within 1-2 business days).
2. Re-contact until *Contact* attends the clinic (daily attempts for 3 consecutive business days).
3. If *Contact* does not come in to the clinic, repeat the following week (daily attempts for 3 consecutive business days), in most appropriate manner (phone, text message, or home visit with appointment card and Contact Notification Letter 2 (section 6.4.8).
4. If *Contact* has not come in to clinic, mail the Contact Notification Letter 3 (section 6.4.9).
5. Discuss *Contact* management at the next case conference with RCDC.
6. When *Contact* attends clinic, ***Contact* should be tested and treated for syphilis in the same visit without awaiting laboratory results*.**
7. For contact who has been tested and treated: if laboratory results are negative, no post-treatment serologic follow-up is needed. If laboratory results are positive, follow the same serologic follow-up and partner notification procedures as for cases.
8. For contact who was tested but refused treatment and the test is negative, retest in 2-4 weeks.

Table 9: Contact Management for Regional Communicable Disease Coordinators (RCDCs)

1. Follow up weekly with the appropriate health care provider(s) treating the *Contacts*, until the following criteria for closure of a *Contact* investigation file is fulfilled:
   a. Seen by a health care provider, serology completed and treatment given (if needed) OR
   b. Lost to follow up due to any of the following:
      - Inadequate information to identify or locate the *Contact*.
      - The *Contact* has moved out of Nunavut and no forwarding contact information is available. If forwarding contact information is available, the RCDC must advise the Territorial Communicable Disease Consultant (TCDC), who will communicate with the other jurisdiction.
      - The *Contact* does not come in to the clinic and the RCDC has discussed this *Contact* at the next case conference with the Office of the Chief Medical Officer of Health.
2. For *Contacts* who are subsequently diagnosed with Syphilis, send completed *Syphilis Report Form* and *STI Contact Investigation Forms* to TCDC (within one of week of diagnosis). These Forms do not need to be submitted for *Contacts* who test negative for Syphilis.

Staging for Surveillance Purposes	
Syphilis Staging	• In contrast to many other infections, the diagnosis and staging of syphilis is complex and based on a combination of factors including history, presence or absence of symptoms and signs and a combination of serologic and/or direct tests and/or CSF tests. • Accurate staging of syphilis is necessary for surveillance purposes to create a detailed picture of the epidemiology of syphilis in the territory, the impact of current interventions and to guide ongoing prevention and control measures. It should be noted that the case classification for medical purposes may differ from surveillance case criteria as the latter are typically more rigorous. • The TCDC/TSC will review all case forms/case details to classify all syphilis cases (including infants born to mothers with positive syphilis serology) prior to submission to the territorial CD epidemiologist.

References

1. **Alberta Blue Book Standards for the Management and Standards of STI Clinic Clients**. Available at: https://www.albertahealthservices.ca/assets/info/hp/srh/if-hp-the-blue-book.pdf

2. **Alberta Treatment Guidelines for Sexually Transmitted Infections in Adolescents and Adults (2018).** Available online at: https://open.alberta.ca/publications/treatment-guidelines-for-sti-2018

3. **Canadian Guidelines on Sexually Transmitted Infections (January 2010 or later).** Available online at https://www.canada.ca/en/public-health/services/infectious-diseases/sexual-health-sexually-transmitted-infections/canadian-guidelines/sexually-transmitted-infections.html

4. JL Robinson; **Canadian Pediatric Society Infectious Diseases and Immunization Committee (2009). Congenital syphilis: No longer just of historical interest.** *Paediatric Child Health, 14(5), 337*

Approval

Approved by Dr. Jasmine Pawa Deputy Chief Medical Officer of Health on November 22, 2018.

Appendix 1: Screening Questions for Neurosyphilis (including Ocular and Otosyphilis)
(Adapted from HIV/STD Program, Public Health Seattle and King County, January 21, 2015. Available at: https://www.kingcounty.gov/depts/health/communicable-diseases/hiv-std/~/media/depts/health/communicable-diseases/documents/hivstd/Screening-Tool-Neurosyphilis.ashx)

Screening questions:

1. *Symptoms of Otosyphilis (ear)*
    a. Have you recently had new trouble hearing?
    b. Do you have ringing in your ears?
2. *Symptoms of Ocular syphilis (eye)*
    a. Have you recently had a change in vision?
    b. Do you see flashing lights?
    c. Do you see spots that move or float by in your vision?
    d. Have you had any blurring of your vision?
3. *Symptoms of neurosyphilis*
    a. Are you having new headaches?
    b. Have you recently been confused?
    c. Has your memory recently gotten worse?
    d. Do you have trouble concentrating?
    e. Do you feel that your personality has recently changed?
    f. Are you having a new problem walking?
    g. Do you have weakness or numbness in your legs?

If the patient has symptoms suggestive of eye, ear or other neurologic involvement and no alternative explanation is available, consult with RCDC regarding next steps. RCDC will consult with TCDC/TSC as needed. In addition, referral for ENT or Ophthalmology assessment may be needed.

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Please fill in OR addressograph/affix label:
Last Name: _____
First Name: _____
Sex (M/F): _____
DOB (dd/mm/yyyy): _____
Chart #: _____
HCP #: _____
Community of Residence: _____

SYPHILIS REPORT FORM (≥2 Years*)

*For children < 2 years use **Syphilis Report Form for Infants**

For use by front line health care providers; please fax or scan to RCDC

Date of Assessment (DDMMYY): _____-_____-_____

Case ID: *(assign after lab-confirmation)* _____

REPORTING CLINICIAN

Name:	Position:
Signature:	Report Date:

BOX 1.1 - DEMOGRAPHIC INFORMATION

Ethnicity (*check **one** box only, unless specified*)

Canadian born:
- ☐ Inuit
- ☐ Other Indigenous (*specify*) _____
- ☐ Caucasian
- ☐ Black
- ☐ Other (*specify*) _____

☐ Foreign-born (*specify country*):

Reporting community: _____

If visiting Nunavut, place of residency: _____

BOX 1.2 - REASON FOR TESTING

check one box only:

- ☐ Known contact of a case
- ☐ Symptomatic of syphilis
- ☐ Prenatal screen
- ☐ STI screen
- ☐ Sexual assault/abuse
- ☐ Follow up serology
- ☐ Other routine screen (including pap smear)
- ☐ Other (*specify*) _____

BOX 1.3 – SYPHILIS HISTORY

Date of most recent possible exposure: __ __ - __ __ - __ __

Pregnant: ☐ Yes (due date : - -) ☐ No ☐ Unknown

Previous Syphilis diagnosis?

☐ No (date of last negative serology:__ __ - __ __ - __ __) ☐ Yes ☐ Unknown

If Yes, Year(s) of previous diagnosis: _____

Stage of previous diagnosis: _____

Date of last serology: __ __ - __ __ - __ __

RPR result: _____

BOX 1.4 - TRAVEL

In the 12 months prior to diagnosis, please list:

Nunavut communities case has travelled to/lived in:

Out of territory travel/residence (specify locations):

BOX 1.5 – SIGNS AND SYMPTOMS

Physical exam done: ☐ Yes ☐ No If No, why?

Symptoms:	**Onset Date** *(dd/mm/yyyy)*
☐ Chancre (specify location):	Date:
☐ General lymphadenopathy	Date:
☐ Condyloma lata	Date:
☐ Rash (specify location):	Date:
☐ Fever	Date:
☐ Neurological**	Date:
☐ Other (specify):	Date:
☐ Asymptomatic	Date:

**see Screening questions for neurosyphilis (Appendix 1. Syphilis Protocol)

BOX 1.6 – RISK FACTORS

Risk factors in the 12 months prior to diagnosis		
Exchange of sex for money/drugs	☐ Yes	☐ No
Been in jail/juvenile detention	☐ Yes	☐ No
Men who have sex with men	☐ Yes	☐ No
Sex without a condom	☐ Yes	☐ No
Multiple sex partners	☐ Yes	☐ No
History of other STI	☐ Yes	☐ No
Under-housed/unstable housing	☐ Yes	☐ No
Felt unsafe in housing situation	☐ Yes	☐ No
Use of alcohol	☐ Yes	☐ No
Use of drugs	☐ Yes	☐ No
Specify drugs used/how used:		

Case name: _____

BOX 1.7 – INITIAL TESTING

Date Blood Drawn	Test	Result: check one box, update as necessary			
_____/_____/_____ *(dd/mmm/yyyy)*	Syphilis EIA	☐ Positive	☐ Negative	☐ Pending	☐ Indeterminate
	RPR	☐ Positive **RPR dils:**	☐ Negative	☐ Pending	☐ Indeterminate
	TPPA	☐ Positive	☐ Negative	☐ Pending	☐ Indeterminate
	HIV (Required to determine treatment)	☐ Positive	☐ Negative	☐ Pending	☐ Indeterminate

BOX 1.8 – TREATMENT Refer to *Syphilis Public Health Protocol* of the Nunavut Communicable Disease Manual (February 2013 or later)

Clinical case staging (check one)	Type of treatment given*	Date(s) Given
☐ Primary	☐ Long-acting Benzathine penicillin G (Bicllin-LA) **single dose** (primary, secondary, early latent)	1.
☐ Secondary	☐ Long-acting Benzathine penicillin G (Bicllin-LA) **weekly X2** (pregnant)	2.
☐ Early latent	☐ Long-acting Benzathine penicillin G (Bicllin-LA) **weekly X3** (late latent)	3.
☐ Late latent	Please note: pre-filled syringe contains 1.2 MU; **you will need 2 syringes per 1 dose**	
☐ Neurosyphilis		
☐ Unknown	**For penicillin allergies only*****:	
☐ Other	☐ Doxycycline**** 100 mg po BID for **14 days**	Date started:
	☐ Doxycycline 100 mg po BID for **28 days (late latent)**	Date started:

*For **all pregnant, HIV+, tertiary, neuro or congenital patients**, must consult with a specialist (Infectious Disease, Pediatrician, and/or Obstetrician) prior to treatment
** MU = million units
*** Refer to Alternative Treatment for Penicillin-allergic Patients in the *Nunavut Communicable Disease Manual* (February 2013 or later)
****NOT to be given in pregnancy.

BOX 1.9 – PUBLIC HEALTH FOLLOW UP

Syphilis staging verified by:

☐ Territorial Syphilis Specialist (name): _____

☐ Territorial CD Consultant (name): _____

☐ Other (specify): _____

Is this a re-infection case? ☐ No ☐ Yes

Surveillance Staging:

☐ Primary
☐ Secondary
☐ Early latent
☐ Late latent
☐ Cardiovascular
☐ Infectious Asymptomatic neurosyphilis
☐ Non-infectious Asymptomatic neurosyphilis
☐ Infectious Symptomatic neurosyphilis
☐ Non-infectious Symptomatic neurosyphilis
☐ Biologic False Positive (BFP)

Recommended Follow-up RPRs:

☐ 1 month*	Date:
☐ 3 months*	Date:
☐ 6 months	Date:
☐ 12 months	Date:
☐ 24 months	Date:
☐ Other (specify)	Date:

*If primary, secondary or early latent case please repeat HIV test at 1 and 3 months

For cases: *STI Contact Investigation Form Complete?* ☐ *Yes* ☐ *No*

FOR CONFIRMED CASES ONLY:
Fax/scan this form and contact tracing list to the Regional CDC within 24 hours:
Qikiqtaaluk: (867) 975-4833
Kitikmeot: (867) 983-4088
Kivalliq: (867) 645-2409

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Please fill in OR addressograph/affix label:
Last Name: _____
First Name: _____
Sex (M/F): _____
DOB (dd/mm/yyyy): _____
Chart #: _____
HCP #: _____
Community of Residence: _____

SYPHILIS REPORT FORM FOR INFANTS (<2 Years)

For use by front line health care providers; please fax to RCDC

Date of Assessment (DDMMYY): _____-_____- _____

Case ID: *(assign after lab-confirmation)* _____

REPORTING CLINICIAN

Name:	Position:
Signature:	Report Date:

MATERNAL INFORMATION

Mother's Name:	Delivery hospital:
Mother's Nunavut HCN:	
Mother's date of birth:	

Maternal Syphilis testing done at birth (check all that apply): ☐ RPR ☐ VDRL ☐ None
Date of RPR/VDRL:
Which lab was RPR/VDRL done at (specify):

INFANT FINDINGS, TREATMENT AND FOLLOW UP

Clinical findings:
☐ Rash (describe):
☐ Splenomegaly
☐ Hepatomegaly
☐ Other (specify):

Radiologic examination:
☐ Long bone radiographs (attach report)
☐ Other (specify):

Initial Laboratory Tests:

Date *(dd/mm/yy)*	Location (i.e. hospital, health centre, etc.)	Type of test	Result

☐ Direct tests (e.g. PCR) – specify type of test/specimen type/result:

Date *(dd/mm/yy)*	Test	Specimen	Result

☐ Lumbar puncture: ☐ No ☐ Yes Date:

Protein	RBC	WBC	VDRL

Treatment: ☐ None ☐ Treatment/prophylaxis provided

Date *(dd/mm/yy)*	Location	Drug	Dose	Route

Recommended Follow up:
Serology (specify frequency):

Next out-patient follow up date:

Case name: _____

PUBLIC HEALTH FOLLOW UP

Staging verified by: Date:

☐ Territorial Syphilis Specialist (name): _____

☐ Territorial CD Consultant (name): _____

☐ Other (specify): _____

Surveillance Staging:

☐ Confirmed congenital

☐ Probable congenital

☐ Non-case (maternal transfer)

☐ Biologic False Positive (BFP)

☐ Awaiting follow up

NOTES:

FOR ALL SUSPECTED INFANT SYPHILIS CASES:
Fax this form to the Regional CDC within 24 hours:
Qikiqtaaluk: (867) 975-4833
Kitikmeot: (867) 983-4088
Kivalliq: (867) 645-2409

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Fax completed form to the Regional CDC update as necessary:

- Baffin: (867) 975-4833
- Kitikmeot: (867) 983-4088
- Kivalliq: (867) 645-8272

Fill in OR affix CASE addressograph here

Last Name: ______________________
First Name: ______________________
Sex: ☐ Male ☐ Female
Date of Birth: ___(DD) _______(month) _____(YYYY)
Chart#: _________________________
Health Card #: _________________________
Community of Residence: __________________

Sexually Transmitted Infection (STI) CONTACT Investigation Form

Disease: ☐ **Chancroid** ☐ **Chlamydia** ☐ **Gonorrhea** ☐ **Syphilis – Stage**_______________

Date of Diagnosis (dd/mm/yyyy):

Name of Contact (Last, First) List as 'unknown' if contact is not named	DOB (dd/mm/yyyy) [If DOB unknown, Age]	Sex (M/F)	Phone Number(s)	Community/ Address	Date of Last Sexual Contact (dd/mm/yyyy)	Tracing Status* (C, L, or R)	Date of lab (dd/mm/yyyy)	Empiric Treatment	Notes
			H: C:		☐ Vaginal________ ☐ Oral__________ ☐ Anal__________			☐ No ☐ Yes	☐ case ☐ not a case
			H: C:		☐ Vaginal________ ☐ Oral__________ ☐ Anal__________			☐ No ☐ Yes	☐ case ☐ not a case
			H: C:		☐ Vaginal________ ☐ Oral__________ ☐ Anal__________			☐ No ☐ Yes	☐ case ☐ not a case
			H: C:		☐ Vaginal________ ☐ Oral__________ ☐ Anal__________			☐ No ☐ Yes	☐ case ☐ not a case
			H: C:		☐ Vaginal________ ☐ Oral__________ ☐ Anal__________			☐ No ☐ Yes	☐ case ☐ not a case

*** Contact Tracing Status**: **C**=Complete; **L**=Lost to Follow Up; **R**=Referred – If Referred, note referral community in column

STI	Stage (syphilis only)	Length of time for contact tracing
Chlamydia	-	60 days
Gonorrhea	-	60 days
Chancroid	-	2 weeks prior to symptom onset
Syphilis*	Primary	3 months prior to symptom onset
	Secondary	6 months prior to symptom onset
	Early latent	1 year prior to diagnosis
	Late latent	Assess marital or long-term partners & children
	Congenital	Assess mother & her sexual partner(s)
	Stage undetermined	Assess in consultation with colleague experienced in syphilis management

REPORTING CLINICIAN

Reporter Name:______________________________

Report Date:________________________________

Contact Information: _________________________

Syphilis Decisional Support Tool

Syphilis: A sexually transmitted infection caused by *Treponema pallidum (T. pallidum)*, a bacterium.

- Syphilis is classified into stages that reflect the degree of infectivity and progression of the disease (see Table 1 below). Stages marked with a * are infectious (including neurosyphilis < 1 year after infection).
- The diagnosis of syphilis is made with a combination of symptoms, signs, past history of syphilis and/or treatment for syphilis as well as the results of direct and serologic tests.

Table 1- Syphilis Stages

Stage	Incubation period	Clinical manifestations
Primary*	3 weeks (3 to 90 days)	Chancre, regional lymphadenopathy
Secondary*	2 to 12 weeks (2 weeks to 6 months)	Rash, fever, malaise, lymphadenopathy, mucus lesions, condyloma lata, patchy or diffuse alopecia, meningitis, headaches, uveitis, retinitis, iritis
Latent	Early*: < 1 year Late: ≥ 1 year	Asymptomatic
	Tertiary	
Cardiovascular syphilis	10 to 30 years	Aortic aneurysm, aortic regurgitation, coronary artery ostial stenosis
Neurosyphilis*	<2 years to 20 years	Ranges from asymptomatic to symptomatic with headaches, vertigo, personality changes, dementia, ataxia, presence of Argyll Robertson pupil
Gumma	1 - 46 years (most cases 15 years)	Tissue destruction of any organ; manifestations depend on site involved
	Congenital	
Early	Onset <2 years	2/3 may be asymptomatic; fulminant disseminated infection, mucocutaneous lesions, osteochondritis, anemia, hepatosplenomegaly, neurosyphilis
Late	Persistence >2 years after birth	Interstitial keratitis, lymphadenopathy, hepatosplenomegaly, bone involvement, anemia, Hutchinson's teeth, neurosyphilis

***infectious (including neurosyphilis < 1 year after infection)**

1 Screening Tests

SEROLOGY:

Serologic testing is the current standard for syphilis diagnosis. There are 3 serological tests:

1. **Syphilis enzyme immunoassay (EIA).** The EIA is an initial screening test. If the EIA is positive, the following 2 tests will be completed by the lab (with the original sample).
2. **Rapid Plasma Reagin (RPR).** The RPR is a measure of disease activity, and is used to follow the response to treatment and to assess for re-infection.
3. ***Treponema pallidum* particle agglutination (TPPA).** The TPPA is used for confirmatory testing. If positive, it is not repeated in individuals over the age of 2 years.

DIRECT TEST FOR POLYMERASE CHAIN REACTION (PCR):

If the patient has lesions suspicious for primary (chancre) or secondary (condyloma lata), swab lesion and place swab in Universal Transport Media (UTM) and indicate "suspect syphilis" on the laboratory requisition. Note that if a specimen is being collected for herpes simplex virus, a second sample will need to be collected.

2 Serology Interpretation/Diagnosis

(+) Syphilis lab reports – begin Syphilis Assessment Report Form (version August 2018 or later). Screen for HIV, gonorrhea, and chlamydia (if not previously tested).

↓

Check Meditech and/or consult with RCDC for prior history of syphilis → **Contact Tracing**

↓ **New case confirmed**

Assessment for staging*:

- **For primary, secondary, and early latent cases: go to #3**
- **For late latent and cardiovascular cases: go to #4**
- **For all HIV+, neurologic symptoms, children (<16 years of age), pregnant* consult with physician**

*** For ALL prenatal cases review Syphilis Decision Support Tool for Pregnancy**

CONTACT TRACING

It is important to ensure all people who have had sexual contact with a case are adequately screened and treated.

Step 1: Complete the *STI Contact Investigation Form* dated August 2018 or later (section 6.4.3).

Step 2: The traceback period for sexual partner follow-up is determined by the stage of syphilis. All sexual and perinatal contacts within the time periods below must be identified and located.

Syphilis stage	Trace-back period
Primary	3 months
Secondary	6 months
Early latent	1 year
Late latent/Tertiary	Consult RCDC
Congenital	Consult RCDC
Stage Undetermined	Consult RCDC

NOTE: Contacts should be tested and treated in the same visit without awaiting laboratory results.

Syphilis Decisional Support Tool

3 Treatment and Serology Follow-up Period: Primary, secondary, and early latent cases

TREATMENT:

- Long-acting Benzathine penicillin G (Bicillin-LA)*
- Dose: 2.4 MU comprised of 2 separate injections of 1.2 MU each.
- Route: Deep intramuscular injection in ventral or dorsal gluteal muscles (NOT deltoid)
- 1 treatment only

*For penicillin allergic patients: refer to treatment section of Syphilis Protocol in Nunavut Communicable Disease Manual (6.4.1)

Serology Follow-up:

- RPR serology should be completed 1, 3, 6 and 12 months after treatment unless RPR is non-reactive.
- Consult RCDC for all RPR titres ≥ 1:32 dilutions at the end of the follow up period; CSF examination may be required.
- HIV serology should be done at baseline and 1 and 3 months.

Adequate Serologic Response* (decline in quantitative RPR titre)

Primary	4-fold** drop at 6 months, 8-fold drop at 12 months
Secondary	8-fold drop at 6 months, 16-fold drop at 12 months
Early Latent	4-fold drop at 12 months

*This is a general guide. Some individuals may decline slower or faster
**4-fold drop is equivalent to a 2-tube drop (e.g. change from 1:32 dilutions to 1:8 dilutions).

4 Treatment and Serology Follow-up Period: Late latent and cardiovascular cases

TREATMENT:

- Long-acting Benzathine penicillin G (Bicillin-LA)*
- Dose: 2.4 MU comprised of 2 separate injections of 1.2 MU each.
- Route: Deep intramuscular injection in ventral or dorsal gluteal muscles (NOT deltoid)
- Repeat dose weekly for 3 consecutive weeks

*For penicillin allergic patients: refer to treatment section of Syphilis Protocol in Nunavut Communicable Disease Manual (6.4.1)

Serology Follow-up:

- RPR serology should be completed 12 and 24 months after treatment unless RPR is non-reactive. Consult RCDC for all RPR titres ≥ 1:32 dilutions at the end of the follow up period.
- HIV serology, urine for gonorrhea and chlamydia should be done at baseline.
- Ensure Syphilis Assessment Report Form has been completed and faxed to RCDC.

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Department of Health
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Ministère de la Santé

Syphilis Decisional Support Tool for Pregnancy and Infancy

<u>Syphilis</u>: A sexually transmitted infection caused by *Treponema pallidum (T. pallidum)*, a bacterium of the order spirochaeta.

- Syphilis is classified into stages that reflect the degree of infectivity and progression of the disease (see Table 1 below). Stages marked with a ***** are infectious (including neurosyphilis < 1 year after infection).
- Diagnosis and treatment of Syphilis in pregnancy requires special considerations. Additionally, there are considerations for the infant in the postpartum period.

Table 1- Syphilis Stages

Stage	Incubation period	Clinical manifestations
Primary*	3 weeks (3 to 90 days)	Chancre, regional lymphadenopathy
Secondary*	2 to 12 weeks (2 weeks to 6 months)	Rash, fever, malaise, lymphadenopathy, mucus lesions, condyloma lata, patchy or diffuse alopecia, meningitis, headaches, uveitis, retinitis
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	Tertiary	
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1 Screening Tests

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Serologic testing is the current standard for syphilis diagnosis. There are 3 serological tests:

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2. **Rapid Plasma Reagin (RPR).** The RPR is a measure of disease activity, and is used to follow the response to treatment and to assess for re-infection.
3. ***Treponema pallidum* particle agglutination (TPPA).** The TPPA is used for confirmatory testing. If positive, it is not repeated in individuals over the age of 2 years.

SEROLOGICAL TESTING IN PREGNANCY:

All pregnant women MUST be screened in the first trimester (initial pregnancy screening), at 24-28 weeks, and near term (35-37 weeks) or at delivery. If the pregnant woman and/or her partner are at risk of becoming infected or re-infected during pregnancy, RPR may be repeated as often as monthly and at delivery. HIV, gonorrhea and chlamydia screens should also be done.

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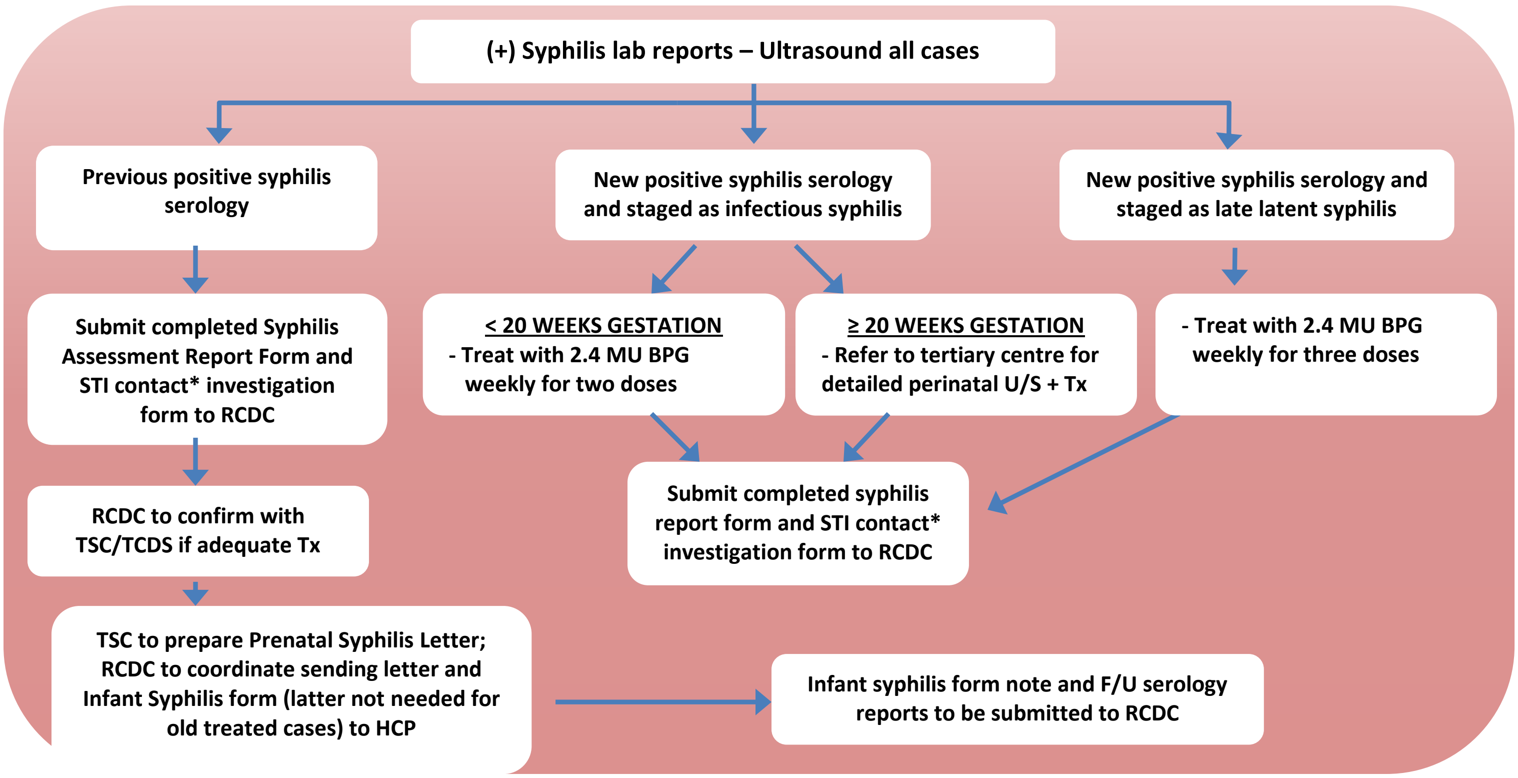
Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

Syphilis Decisional Support Tool for Pregnancy and Infancy

2 Case Follow-up of Pregnant Women with Positive Serology



*Contact follow-up the same as non-pregnant females/males. See Syphilis Decisional Support Tool for further details.
** Serology follow-up the same as non-pregnant females/males. See Syphilis Decisional Support Tool for further details.

3 Case Follow-up of Infants Born to Pregnant Women with Positive Syphilis Serology

NOTE: If congenital syphilis is suspected based on mother's serologies or concerning symptoms, consult with a pediatric infectious disease specialist regarding further work up which may include long bone x-rays, lumbar puncture and other investigations.

Mother	Infant Serology Screening and Follow-up
Adequately treated syphilis prior to pregnancy	➢ Clinical or serologic follow up of infant not required unless it is suspected that the mother may have acquired syphilis during pregnancy.
Adequately treated late latent syphilis during pregnancy	➢ Serology (syphilis EIA, RPR, TPPA) at birth and 6 months of age. ➢ If any serologic test remains positive at 6 months, repeat at 15-18 months. ➢ If any serologic test remains positive after 18 months of age, consult with RCDC.
Adequately treated infectious syphilis during pregnancy	➢ Pediatrician to be involved in follow-up and care of infant and will complete *Infant Syphilis Assessment* Form with recommendations for follow up. ➢ Minimum serologic follow up at birth and 6 months of age. ➢ If any serologic test remains positive at 6 months, repeat at 15-18 months. ➢ If any serologic test remains positive after 18 months of age, consult with RCDC.
Untreated syphilis during pregnancy	➢ Consult RCDC and pediatrician/specialist

Date: _____

Dear: _____

The _____ Health Center/Iqaluit Public Health has been trying to reach you, and needs to meet with you to discuss a matter about your health and wellbeing.

Please call _____ to make an appointment as soon as possible.

RN/CHN _____

Appointment Date and Time _____

Date: _____

Dear: _____

The _____ Health Centre is giving you this letter because it is likely that you have been exposed to an infectious disease.

This infection can be treated. Even though you may not have symptoms, it can have serious effects on your health if left untreated.

It is important for you to have a health check-up as soon as possible.

Please call _____ to make an appointment.

RN/CHN _____

Appointment Date and Time _____

Date: _____

Dear: _____

The _____ Health Center/Iqaluit Public Health has been trying to reach you. You have been named as a contact of someone who has an infectious disease or your test result shows that you have an infection.

Please come to the health center to make sure you are properly tested and treated for this disease.

Although you may not feel sick at this time, if these infections go untreated they can cause anyone with whom you are in close contact to become ill and/or you may become more seriously ill in the future.

Please call _____ to make an appointment as soon as possible.

RN/CHN _____

Appointment Date and Time _____

Fact Sheet
Syphilis

What is syphilis?
Syphilis is a sexually transmitted infection (STI) caused by the bacteria Treponema pallidum.

How do you get syphilis?
The more sexual partners you have, the more likely you are to be exposed to a STI. You can get syphilis, like any other STI, through unprotected vaginal, anal or oral sex. It can also be passed from an infected mother to her baby while it is in the womb.

What are the symptoms of syphilis?
Early syphilis has symptoms, as the infection progresses symptoms disappear – this does not mean the infection is gone! Even if symptoms go away you can still spread infection and should be tested and treated. It can also damage your baby while you are pregnant. When the syphilis bacteria enters the body, the infection goes through stages:

•The **primary stage** occurs when the bacteria enters the body. A painless sore (chancre) usually appears within 3 to 90 days after sexual contact with an infected person. Many people do not notice the sore because it is painless and can heal without treatment, but this does not mean the infection is gone. Without treatment the infection continues to the next stage.

•The **secondary stage** usually occurs 2 weeks to 6 months after the chancre. A rash may develop anywhere on the body, but most often on the palms of the hands and the soles of the feet. There are also other symptoms.

•**Latent stage** follows the secondary stage and can last for over 20 years - the rash disappears without treatment and there are no more symptoms, however the bacteria is still spreading in the body.

•**Tertiary stage** follows the latent period - the bacteria that spread cause damage to the body including the heart, brain and other organs leading to death.

How do you know you have syphilis?
A blood test is used to diagnose syphilis. If you think you have been infected, tell the doctor/nurse, and ask for a blood test.

What is the treatment for syphilis?
Most cases of syphilis can be treated with 2 injections of penicillin given at the same time. Some people will need more doses of the 2 injections given one week apart. After the treatment, follow-up blood tests are done to make sure the treatment worked.

It is important that the individual who is being treated and any of their sex partners not have sex for 7 days after both of them have finished the treatment.

What other tests should be done?
You should get tested for other STIs including: chlamydia, gonorrhea and HIV. If you have an untreated STI like syphilis, it is easier for you to get HIV. It is also possible to have more than one infection at a time, so it is important to get tested for other STIs.

What about sexual partners?
All sexual partners need to be tested and treated if they are infected.
- Primary stage, tell partners within the past 3 months.
- Secondary stage, tell partners within the past 6 months.
- Latent and tertiary stage, tell partners within the past year and long-term partners. Children may also need to be tested.

Fact Sheet

ᓯᕕᓕᔅ

ᑭᓲᕙ ᓯᕕᓕᔅ?

ᓯᕕᓕᔅ ᓄᓕᐊᕐᓂᒃᑯᑦ ᐊᐃᑦᑐᕐᓗᒃᑕᐅᓲᖑᔪᖅ ᖁᐱᕐᕈᐊᕐᔪᖕᓂᒃ ᐊᑎᖃᖅᑐᒥ ᑐᕋᐳᓃᒪ ᐸᓕᑕᒻ.

ᖃᓄᖅ ᓯᕕᓕᔅᑖᓇᕐᒪ?

ᑭᒃᑯᑐᐃᓐᓇᐃᑦ ᐊᑕᐅᓯᐅᙱᑦᑐᒥᑦ ᓄᓕᐊᕐᓂᖃᑎᖃᖃᑦᑕᖅᑐᑦ ᐊᑦᑕᕐᓇᖅᑐᒦᓂᖅᓴᐅᓕᖃᑦᑕᖅᑐᑦ ᖁᐱᕐᕆᑕᐅᓂᕐᒧᑦ. ᑭᓇᑐᐃᓐᓇᖅ ᓴᐳᔾᔭᐅᓯᒪᙱᑦᑐᒥᑦ ᐅᑦᑐᒃᑯᑦ, ᐃᑎᒃᑯᑦ ᖃᓂᒃᑯᓘᓐᓃᑦ ᑯᔭᖃᑎᖃᖅᐸᑦ ᓯᕕᓕᔅᑖᑐᐃᓐᓇᕆᐊᓕᒃ. ᓇᔾᔨᔪᖅ ᐊᐃᑦᑐᕐᓗᒃᑕᐅᓯᒪᓕᖅ ᖁᐱᕐᕆᓇᖅᑐᒧᑦ ᐊᐃᑦᑐᐃᑐᐃᓐᓇᕆᐊᓕᒃ ᓄᑕᕋᒥᓄᑦ ᐃᓪᓕᐊᖓᓃᑎᓪᓗᓂ ᐊᒻᒪ ᐋᓐᓂᐊᕈᑎᐅᔪᖅ ᐊᑦᑕᕐᓇᑐᐃᓐᓇᕆᐊᓕᒃ ᓄᑕᕋᒃᓴᖓᓄᑦ.

ᖃᓄᐃᑦᑑᒻᒪᑕ ᐋᓐᓂᐊᕈᑕᐅᖃᑦᑕᖅᑐᑦ ᓯᕕᓕᔅᒧᑦ?

ᓯᕕᓕᔅᖃᓖᕋᕐᓂᖓᓂ ᐋᓐᓂᐊᕈᑎᓂᑦ ᓴᖅᑮᔭᖅᑐᖃᓲᖅ (ᑕᑯᓗᒍ ᐱᒋᐊᓕᕋᑖᕐᓂᖓᓂ ᐊᑖᓂ), ᑭᓯᐊᓂ ᐋᓐᓂᐊᖑᔪᖅ ᐱᕝᕙᓪᓕᐊᑎᓪᓗᒍ ᐋᓐᓂᐊᕈᑕᐅᖃᑦᑕᖅᑐᑦ ᐊᓯᐅᒪᓗᐊᓐᓇᕆᐊᓛᑦ. ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᓇᓗᓇᐃᖅᓯᙱᑦᑐᖅ ᐋᓐᓂᐊᖃᙱᓐᓂᖅᓴᖅᑐᖅ. ᐋᓐᓂᐊᕈᑕᐅᖃᑦᑕᖅᑐᑦ ᐊᓯᐅᒪᓗᐊᖅᑎᑦᑐᑎᑦ ᐱᒻᒪᕆᐅᕗᖅ ᖃᐅᔨᓴᖅᑕᐅᑎᑦᑐᑎᑦ ᐊᒻᒪ ᐃᓗᓯᓴᖅᑕᐅᓗᑎᑦ. ᑭᒃᑯᑐᐃᓐᓇᐃᑦ ᐊᐃᑦᑐᐃᔪᓐᓇᕐᒪᑕ ᐋᓐᓂᐊᖑᔪᒥᑦ ᐋᓐᓂᐊᕈᑎᖃᒃᑯᔨᙱᒃᑲᓗᐊᖅᐸᑕ. ᐊᑖᓃᑦᑐᑦ ᓇᓗᓇᐃᖅᓯᔪᑦ ᐊᕕᑦᑐᖅᓯᒪᓂᖏᑦ ᓯᕕᓕᔅᒧᑦ ᐋᓐᓂᐊᖑᔪᒧᑦ ᖃᓄᕐᓗ ᐱᕝᕙᓪᓕᐊᓲᖑᒻᒪᖔᖅ:

- ᐱᒋᐊᓕᕋᑖᕐᓂᖓᓂ - ᑕᕝᕙᓃᑎᓪᓗᓂ ᖁᐱᕐᕈᐊᕐᔪᒃ ᑎᒥᒨᓕᕋᖅᑐᖅ. ᐋᓐᓂᓇᙱᑦᑐᖅ ᐊᒥᕐᓗᒃ (ᐊᒻᒪᑎ) ᓴᖅᑭᒪᔪᓲᖅ ᐅᓗᐃᑦ ᐱᖓᓱᑦ 90ᓄᑦ ᐊᐃᑉᐸᖅᑲᓚᐅᖅᑐᓂ ᐋᓐᓂᐊᖅᑲᖅᑐᒥᑦ. ᐃᓄᒋᐊᓲᑦ ᐅᔾᔨᕐᓱᙱᑦᑐᑦ ᐊᒥᕐᓗᖏᑦ ᓲᖃᐃᒻᒪ ᐋᓐᓂᓇᙱᒪᑦ. ᐊᒥᕐᓘᔪᖅ ᒪᒥᓴᔪᓲᖑᓪᓗᓂ ᐃᓅᓯᖅᑕᐅᓇᓂ, ᑭᓯᐊᓂ ᑖᓐᓇ ᓇᓗᓇᐃᖅᓯᙱᑦᑐᖅ ᐋᓐᓂᐊᖃᙱᓐᓂᖅᓴᖅᑐᖅ. ᐃᓅᓯᖅᑕᐅᙱᑉᐸᑦ ᐋᓐᓂᐊᕆᔭᐅᔪᖅ ᑭᖑᓂᖓᓅᓕᕋᔭᖅᑐᖅ;
- ᑭᖑᓂᖓᓂ – ᑕᐃᒪᐃᒐᔪᒃᑐᖅ ᒪᕐᕉᖕᓂᒃ ᐱᖓᓲᔪᖅᑐᓄᑦ 2-6 ᑕᖅᑮᑦ ᐊᓂᒍᖅᑎᓪᓗᒋᑦ ᐊᒥᕐᓗᓚᐅᖅᑎᓪᓗᒍ (ᐊᒻᒪᑎ). ᐊᐅᐸᓛᓕᑐᐃᓐᓇᕆᐊᓕᒃ ᓇᐅᒃᑯᑐᐃᓐᓇᖅ ᑎᒥᒥᒍᑦ. ᐃᑎᒪᒃᑯᑦ ᐊᒻᒪ ᐊᓗᒃᑯᑦ ᐊᐅᐸᓛᓂᖃᓚᔪᓲᖑᓪᓗᓂ;
- ᐆᒻᒪᒃᓯᒪᙱᓐᓂᖓᓂ - ᐊᕙᑎᓄᑦ ᐊᕐᕌᒍᓄᑦ ᑕᒪᐃᑦᑐᓐᓇᖅᑐᖅ - ᐊᐅᐸᓛᓐᓂᐅᔪᖅ ᐊᓯᐅᓲᖑᓪᓗᓂ ᐃᓅᓯᖅᑕᐅᓇᓂ ᐊᒻᒪ ᐋᓐᓂᐊᕈᑕᐅᖃᑦᑕᖅᑐᓂᒃ ᓴᖅᑮᔭᖅᑐᖃᕋᓐᓂᖅᑐᓂ. ᐃᓅᓯᖅᑕᐅᑦᑎᐊᙱᑉᐸᑦ, ᖁᐱᕐᕈᐊᕐᔪᑦ ᑎᒥᓐᓂ ᓯᐊᒻᒪᒃᐸᓪᓚᐊᑐᐃᓐᓇᕐᓂᐊᖅᑐᑦ;
- ᐱᖓᔪᖓᓂ - ᖁᐱᕐᕈᐊᕐᔪᐊᑦ ᓯᐊᒻᒪᒃᓯᒪᓕᖅᑐᑦ ᐊᒻᒪ ᓱᕋᒃᑕᐅᔪᓐᓇᖅᓯᔪᖅ ᑎᒥᒧᑦ. ᐃᓚᖃᕈᓐᓇᖅᑐᖅ ᐆᒻᒪᑎᒥᑦ, ᖃᕋᓴᕐᒥᑦ ᐊᓯᖏᓪᓗ ᐱᒻᒪᕆᐅᔪᑦ ᑎᒥᐅᑉ ᐊᐅᓚᔾᔪᑎᖏᓐᓂ. ᐃᓛᓐᓂᒃᑯᑦ ᖁᐱᕐᕈᐊᕐᔪᐊᑦ ᓯᐊᒻᒪᒃᐸᓪᓚᐊᓐᓂᖏᓐᓄᑦ ᑐᖁᔾᔪᑕᐅᔪᓐᓇᖅᑐᖅ.

ᖃᓄᕐᓕ ᖃᐅᔨᓴᖅᐱᑦ ᓯᕕᓕᔅᖃᕐᒪᖔᖅᐱᑦ?

ᐊᐅᒃᑯᑦ ᖃᐅᔨᓴᖃᑦᑕᖅᑐᑦ ᓇᓗᓇᐃᖅᓯᓇᓱᐊᕐᓂᕐᒥᑦ ᓯᕕᓕᔅᒥᑦ. ᐊᐃᑦᑐᕐᓗᒃᑕᐅᓯᒪᓇᓱᒋᒍᕕᑦ, ᓄᓇᓕᓯᓐᓂ ᐋᓐᓂᐊᕕᓕᐊᕐᓗᑎᑦ ᐊᒻᒪ ᔫᒃᑖᒥᑦ ᐋᓐᓂᐊᓯᐅᖅᑎᒨᓐᓂᑦ ᐅᖃᖃᑎᖃᕐᓗᑎᑦ, ᐊᐅᒃᑯᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᒪᓗᑎᑦ.

ᖃᓄᖅ ᐃᓅᓯᖅᑕᐅᓲᖑᒻᒪᑦ ᓯᕕᓕᔅ?

ᐃᓚᖏᑦ ᖁᐱᕐᕆᓯᒪᓂᓵᑦ ᓴᙱᒃᑎᑉᐸᓪᓚᐊᓲᒥᒃ ᑲᒪᒋᔭᐅᔪᓐᓇᖅᐸᒃᑐᑦ ᒪᕐᕿᒃ ᑲᐳᑎᒃᑯᑦ ᐄᔭᒐᖅᑎᑕᐅᑦᑐᑎᒃ ᐊᑕᐅᑦᑎᒃᑯᑦ. ᐃᓛᓐᓂᒃᑯᑦ ᒪᕐᕿᒃ ᑲᐱᔭᐅᔫᒃ ᐱᓇᓱᐊᕈᓯᕐᒥ ᐊᑯᑦᑐᓂᖃᒑᖅᑐᒥ ᐊᑕᐅᓯᐊᕐᓗᑎᒃ ᒪᕐᕿᐊᕐᓗᑎᒃ ᑐᓐᓇᖅᓂᑦ ᐄᔭᒐᖅᑎᑕᐅᓗᑎᒃ. ᑕᐃᓐᓇ ᐃᓄᒃ ᑲᐳᑎᓅᕋᓐᓇᙱᑉᐸᑦ, ᐄᔭᒐᖅᑎᑕᐅᙳᕋᓐᓇᖅᑐᖅ. ᐱᒻᒪᕆᐅᔪᖅ ᐃᓄᒃ ᑲᒪᒋᔭᐅᔪᖅ ᐊᒻᒪ ᐱᖃᑎᒥᖃᑦᑕᖅᓯᒪᔭᕐᒥᑦ ᐱᖃᑎᒦᒃᐸᙱᑦᑐᑎᒃ ᐱᓇᓱᐊᑭᓯᓛᕐᒥ ᐄᔭᒐᕆᐊᖃᖅᑕᕐᒥᑦ ᓄᖑᓚᐅᙱᓐᓂᖏᓐᓂᒃ.

ᖃᓄᐃᑦᑐᓂᑦ ᖃᐅᔨᓴᒃᑲᓂᕆᐊᖃᔭᖅᐱᑦ?

ᖃᐅᔨᓴᖅᑕᐅᓪᓗᐊᕐᒥᔪᑦ ᐊᓯᖏᓐᓄᑦ ᓄᓕᐊᕐᓂᒃᑯᑦ ᖁᐱᕐᕆᔮᖅᑕᐅᕙᒃᑐᓄᑦ ᐃᓚᒋᔭᐅᔪᑦ: ᒃᓚᒥᑎᐊ, ᒎᓇᕇᐊ ᐊᒻᒪ ᐊᓴᐱ. ᐃᓅᓯᖅᑕᐅᓯᒪᙱᑦᑐᒥᑦ ᓄᓕᐊᕐᓂᒃᑯᑦ ᖁᐱᕐᕆᓯᒪᒍᕕᑦ ᓲᕐᓗ ᓯᕕᓕᔅᒥᑦ, ᐱᔭᕆᐊᑭᓐᓂᖅᓴᐅᕗᖅ ᐊᓴᐱᑖᓂᕐᒧᑦ.

Fact Sheet
ᓯᕐᓂᖅ

ᐊᑕᐅᓯᐅᖏᓐᓄᑦᑐᑦ ᖃᐅᐱᖃᓕᓯᒪᓕᖅᑐᖅ ᐊᑕᐅᑦᑎᐅᑦ, ᐱᓪᒪᓗᐅᕐᖓᖅ ᖃᐅᐅᔪᓴᖅᑕᐅᓂᖅ ᐊᓯᖏᑎᓐᓄᑦ ᓄᓕᐊᖃᓂᐅᑦ ᖃᐅᐱᖃᓐᓇᕐᓂᐅᖅᑐᖅ.

ᑕᒪᐅᑯᐊᑦ ᓄᓕᐊᖃᓂᐅᑦ ᐊᐃᑦᑐᓗᕐᓂᐅᖅᑐᑦ?

ᓄᓕᐊᖃᓂᐅᑦ ᐊᐃᑦᑐᓗᖃᑦᑕᖅᑕᓕᒫᑎᓄᑦ ᖃᐅᐅᔪᓴᖅᑕᐅᑎᐊᖃᖅᖁᓕᖅ ᐊᓪᓚ ᐃᓅᓕᓴᖅᑕᐅᓗᑎᓄᑦ ᐊᐃᑦᑐᑦᓯᓗᑕᐅᔪᒪᓕᖅᑕ.

· ᐱᑎᐊᓕᕆᑦᓂᖅᓱᓕᖅᑐᑦ, ᐊᐃᑦᑐᓗᓕᐅᖅᑕᑎᓄᑦ ᑕᖅᑭᑦ ᐱᖅᓱᔪᑦ 3 ᐃᓗᐊᓂ ᐅᖅᐅᑎᓗᑎᓄᑦ.

· ᑭᖓᓂᖅᓱᓕᖅᑐᑦ, ᐊᐃᑦᑐᓗᓕᐅᖅᑕᑎᓄᑦ ᑕᖅᑭᑦ ᐱᖅᓱᓪᓚᖅᑐᑦ 6 ᐃᓗᐊᓂ ᐅᖅᐅᑎᓗᑎᓄᑦ.

· ᐅᓪᓚᒃᓭᒪᓂᖅᓱᓕᖅᑐᑦ ᐊᓪᓚ ᐱᖅᓴᖅᓱᓕᖅᑐᑦ, ᐊᐃᑦᑐᓗᓕᐅᖅᑕᑎᓄᑦ ᐊᖅᑲᒍ ᐃᓗᐊᓂ ᐊᓪᓚ ᐊᐃᑦᑐᓗᓇᓪᓚᖅᑕᑎᓄᑦ ᐅᖅᐅᑎᓗᑎᓄᑦ. ᓱᕈᓱᑦ ᖃᐅᐅᔪᓴᖅᑕᐅᑐᐃᓐᓇᓕᐊᖅᑎᒋᓕᖅ.

ᑕᑯᑎᐊᖅᓗᒍ (http://www.irespectmyself.ca) ᐃᓕᓐᓂᐊᕆᐅᓐᓂᑎᒍᑦ ᓄᓕᐊᖅᑎᒋᑦ ᖃᓄᐃᐃᓐᓇᒋᐊᖅᓂᖅᑐᑦ ᐊᓪᓚ ᐊᐃᑦᑐᖃᖅᑎᒋᒍᑦ.

Feuille de renseignements
Syphilis

Qu'est-ce 'est-ce que la syphilis?
La syphilis est une infection transmissible sexuellement (ITS) causée par la bactérie Treponema pallidum.

Comment la syphilis se transmet-elle?
Les personnes qui ont plus d'un partenaire sexuel accroissent leur risque de contracter une ITS. La syphilis se transmet lors de relations sexuelles vaginales, anales ou orales non protégées. Les femmes enceintes qui ont une ITS peuvent également la transmettre à leur fœtus et il est possible que la santé du bébé soit affectée.

Quels sont les symptômes de la syphilis?
Des symptômes apparaissent en période de syphilis précoce (voir le premier stade ci-dessous), toutefois, à mesure que l'infection progresse les symptômes peuvent disparaître. Cela ne veut pas dire que l'infection a disparu! Même si les symptômes disparaissent, vous devez subir un test de dépistage et recevoir un traitement médical si le test s'avère positif. Les personnes infectées peuvent transmettre l'infection même si elles ne présentent aucun symptôme.

Une description des divers stades de la syphilis et de son évolution figure ci-dessous :

• Le premier stade, la syphilis primaire, débute lorsque la bactérie pénètre dans l'organisme. Une ulcération indolore appelée chancre apparaît généralement de 3 à 90 jours après un contact sexuel avec une personne infectée. Puisqu'elle est indolore, de nombreuses personnes ne remarqueront pas la présence de l'ulcération, qui peut disparaître sans traitement, ce qui ne signifie pas que l'infection soit disparue. En l'absence de traitement, l'infection évoluera vers le deuxième stade.

• Le deuxième stade, soit la syphilis secondaire, s'amorce de deux semaines à six mois après l'apparition du chancre. Une éruption cutanée peut se produire sur n'importe quelle partie du corps, mais apparaît le plus souvent sur la paume des mains et sur la plante des pieds.

• Le stade latent, soit la syphilis latente, peut durer plus de 20 ans; l'éruption cutanée disparaît sans traitement et la personne infectée est asymptomatique. Sans traitement adéquat, la bactérie continue de se propager dans l'organisme.

• Le stade tertiaire, la bactérie envahit les organes internes du corps et peut causer d'importantes lésions au cœur, au cerveau et à d'autres organes, et même la mort dans certains cas.

Comment diagnostique-t-on la syphilis?
Une analyse de sang permet de diagnostiquer la syphilis. Si vous croyez avoir été infecté, présentez-vous à votre centre de santé communautaire et parlez à un médecin ou à une infirmière et demandez qu'une analyse de sang soit effectuée.

Quel est le traitement contre la syphilis?
La plupart des cas de syphilis peuvent être traités avec deux injections simultanées de pénicilline. Parfois, les deux injections peuvent être administrées à une semaine d'intervalle si une ou deux doses supplémentaires sont nécessaires. Des comprimés peuvent être administrés aux personnes ne pouvant recevoir de pénicilline. Il est important que la personne traitée ainsi que son ou ses partenaires sexuels n'aient pas de relations dans les sept jours suivant la fin de leur traitement respectif.

Feuille de renseignements

Syphilis

Y a-t-il d'autres tests à subir?

On suggère de passer un test de dépistage d'autres ITS, notamment la chlamydia, la gonorrhée et le VIH. Le VIH se transmet plus facilement aux personnes présentant une ITS non traitée telle que la syphilis. Puisqu'il est possible d'être atteint de plus d'une infection en même temps, il est important d'effectuer des tests de dépistage pour d'autres ITS.

Qu'en est-il des partenaires sexuels?

Tous vos partenaires sexuels doivent subir un test de dépistage et être traités s'ils sont infectés.

- Lors du premier stade, avertissez tous vos partenaires des trois derniers mois.
- Lors du deuxième stade, informez tous vos partenaires des six derniers mois.
- Lors des stades latent et tertiaire, informez tous vos partenaires de la dernière année et vos partenaires de longue date. Les enfants issus de ces relations doivent subir un test de dépistage.

Visitez le site (http://www.irespectmyself.ca) pour en apprendre davantage sur la santé sexuelle et les relations sexuelles.

Kangikhitjutikhaq
Syphilis

Hunauva syphilis?
Syphilis nuliaqnikkut hiamititqiyauvaktuq aanniarut (STI) aannialaqinnaqtumit Treponema pallidum.

Qanuq aanniarutiqalikpakpat syphilismik?
Inuit tahapkuat nuliakatiqaqtut amigaitqiyamik atauhikmit aanniarutiqaqqaaqtut STI-mik. Inuk qayagingitkumi nuliaknikkut uttukkut, itikkut qanikkulluuniit aanniarutiqaqtaaqtut syphilis-mik. Hingaihimayuq arnaq aanniarutilik STI-mik aanniartittaaqtaa ilumiutani aanniarut ihuirutiniaqhuni ilumiutaminut.

Hunauvat aanniarutit syphillismik?
Qilamik pitjutigiyait syphilis-mut aanniarutingit (takulugu hivulliqmik pitjutaa ataani), kihimi aanniarutiniliktitlugu aanniarutigiyait naunaittut tammaqpakniarungnaqhiyut. Taimaa kangikhitjutigingitaa aanniarutaiktumik. Aanniarutigiyat naunaittut tammaraluaqtitlugit ihivriuqtauyughauyutit munaqhinillu ikayuqtaulutit. Inuit himaitirtaaqtaa aanniarut naunaitkaluaqtitlugit aanniarutingit. Ataani allatqiit pitjutignit syphilis-mut aanniarutiqaqtunut qanuqlu pivagiangani kakugunguraangat:

- Hivulliqmik pitjutaa – uumani pitjutaani aanniarut hivulliqmik timimungakpaktuq. Ulurianaittuq (kilaangniq) takunnaqhivaktuq iluani 3-mit 90-mut ubluni nuliaruiqpata inungmut aanniarutiqaqtumut. Amihut inuit takuyuitait kilaaqniq ukurianainmat. Ilanii kilaangniq mamitpaktuq munariyauhimaittumik, kihimi kangikhitjutigingitaa aanniarutaiktumik. Munariyaungitkumi aanniarut hivumuuqniaqtuq tuglianut pitjutaanut;
- Tugliani pitjutaa – pivaktuq malrukni havainiqni 6-nut tatqirhiutinut kilaaruiqhimalikkat (kilaangniq). Uvinirlukniarungnaqhiyuq timimi. Uvinirlukpaktut itimakmi algakni ataanilu (aluani) itigakni;
- Timimihimmaaqtitlugu pitjutaa – hivitunirivagait amigaitqiyaanit 20-ni ukiuni – uvinirlukniq tammaqpaktuq munariyauhimaittumik naunaittunik aanniarutaikhutik. Ihuaqtumik munariyaungitkumik, aanniarut hiaminniaqtuq timingnut;
- Pingahuani pitjutaa – aanniarut himaitpaktuq ihuirutilunilu ilanginni timingni. Ukuat ilangit uumatimi, qaritaq ahinilu timimi aulatjutini ittuni. Ilaani hiamitjutaa aanniarutip tuqunnaqtuq.

Qanuq ilihimaniaqqit aanniarutiggungni syphilis?
Aungmi naunaiyaivlutik naunaikpagaat una syphilis .Aanniarutiqaqnahugiguvit, munaqhiqarvikmungaulutit uqaqvigilugu taakti munaqhiluuniit, apiqhilutit aungmut naunaikhitkulugit.

Huna ikayuuikhaa syphilis-mut?
Amihuni pidjutini syphilis-mut munariyaunginnarialgit malruknut kapouqhirlutik havaunmik penicillin atattimut tunilugik. Ilaani malruk kapuqhiutik tuniinnarialgik atauhiqmi havainiqmi pilugik atauhiqmut malruknulluunniit havautingnut. Inuk havautitulimaitpat penicillin-mik, havautinik tuniinnariagit. Piyakhauyuq taamna inuk munariyauliqtuq nulliarp[agaillu paanariini nuliaqatigiiktukhaungittut 7-ni ubluni iniqhigumik munaridjutikhanut piyamingnik.

Ikayuutikhaa hivitunianut syphilis-mut uumani malrukni havainiqni. Ihivriuqtaulutik autiguttauk. Aungmut ihivriurut naunaikniaqtaa kitu ikayutauyaangat. Taimaa inuk munariyauyuq nuliakhimaittumik piluni iniqtinnagu tamaat ikayuutikhamut piyainut hivitunia iniqqat unalu iniqtirutaa aungmut ihivriurutit naunaikhitjutait tuniyaukpata.

Kangikhitjutikhaq
Syphilis

Hunanik allanik ihivriurutikhat piniaqqigit?
Inuit ihivriuqtauyakhat allanut STI-nut ukuningalu: Chlamydia, Gonorrhea unalu HIV. Munariyaungitkuvit STI-mut uumatut syphilis, qilamik aanniarutikaliktaaqtutit HIV-mut. Ilaani aanniarutiqaqpaktut amigaitqiyaanit atauhiqmit aanniarutimit aanniartitluni,taimaatut ihivriuqtauyughauyut allanut STI-nut.

Ukuattauk nuliakatigiit?
Tamaita nuliaqatigiit ihivriuqtauyughat munariyaulutiklu aanniarutiqarumik.

- Hivulliqmik pitjutaa,uqaqvigilugit nuliaqatigiit qaangiktinnagu pingahut tatqirhiutit.
- Tugliani pitjutaa, uqaqvigilugit nuliaqatigiit qaangiktinnagu 6-ni tatqirhiutit.
- Timimiititlugu unalu pingahuani pitjutaa, , uqaqvigilugit nuliaqatigiit qaangiktinnaguatuqtuq ukiunga ukuatlu aipparihimmaaqpaktani. Nutaqqat ihivriuqtauniarungnaqhiyut.

Takuyakturlugu qaritauyakkut (http://www.irespectmyself.ca) naunaikyuumilugit nuliarnikkut pikatigiigutikhanullu.

7.0 Vaccine Preventable Infections

Contents

7.0 Vaccine Preventable Infections

Purpose

The purpose of this section of the Communicable Disease Manual is to provide guidelines for the investigation and management of individuals who have been diagnosed with notifiable infections spread by vaccine preventable diseases, including Diphtheria, Invasive *Haemophilus influenzae* (types A and B), Measles, Mumps, Pertussis, Poliomyelitis, Rubella, Congenital Rubella, Smallpox, Tetanus and Varicella.

Legislation/Policy

Authority for the reporting of notifiable infections spread by vaccine preventable diseases and their public health management comes from the *Public Health Act, Communicable Disease Regulations*.

All clients who have been diagnosed with a notifiable infection spread by vaccine preventable diseases must be reported to the Chief Medical Officer of Health (CMOH).

All clients who are suspected to have or have a confirmed notifiable infection spread by vaccine preventable diseases are to be followed as per the protocols in this section.

Roles and Responsibilities

Table 7.1: Roles and responsibilities for follow up of vaccine preventable infections

Role	Responsibilities
Laboratory	• Report all laboratory confirmed notifiable vaccine preventable infections to the CMOH or designate.
Health Care Provider team (Physician, Nurse Practitioner, Community Health Nurse, Licensed Practical Nurse, Public Health Nurse)	• Test all clients suspected to have a notifiable vaccine preventable infection. • Treat all clients with a notifiable vaccine preventable infection. • Complete public health case and contact management (as applicable) of clients with a notifiable vaccine preventable infection. • Complete the appropriate case report form(s) and send it to the Regional Communicable Disease Coordinator (RCDC).
Regional Communicable Disease Coordinator	• Provide advice on a regional basis for the case and contact management (as applicable) of notifiable vaccine preventable infections. • Receive and review reports of notifiable vaccine preventable infections. • Consult with the Territorial Communicable Disease Consultant (TCDC) as required.
Territorial Communicable Disease Consultant	• Provide advice on a territorial basis for the case and contact management (as applicable) of notifiable vaccine preventable infections. • Ensure cases are included in the communicable disease information system.

Chief or Deputy Chief Medical Officer of Health	• Be available for consultation on notifiable vaccine preventable infections. • Make program recommendations.

7.1.1 Diphtheria

Special Precautions/Considerations

Precautions: Direct and Indirect Contact

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Diphtheria is caused by *Corynebacterium diphtheriae*, a gram-positive bacillus. Strains may be toxigenic or nontoxigenic. Only the toxigenic strain produces exotoxin and can cause serious disease.
Clinical	
Clinical Presentation	Diphtheria is an acute bacterial disease that can involve almost any mucous membrane, primarily involving the pharynx, tonsils, larynx or nose and occasionally the skin, conjunctivae or vagina. The characteristic lesion, caused by liberation of a specific cytotoxin, is marked by a patch or patches of an asymmetrical adherent greyish white membrane with surrounding inflammation. Diphtheria can be classified based on site of infection: (1) **Pharyngeal/tonsillar**: This is the most common site of infection and is associated with the absorption of toxin. The onset is insidious. Early symptoms include malaise, sore throat, anorexia and low-grade fever. Two to three days later the membrane appears in the pharyngeal/tonsillar area. The membrane initially appears white and glossy, but evolves into a dirty gray color with patches of green or black necrosis. The extent of the membrane correlates with the severity of symptoms. In cases of severe disease the individual may also develop edema of the submandibular areas and the anterior neck, along with lymphadenopathy, giving the characteristic "bullneck" appearance. The individual may recover or, depending on the amount of toxin absorbed, develop severe illness, pallor, rapid pulse, stupor and coma with death occurring in 6-10 days. (2) **Nasal:** Symptoms include a mucopurulent nasal discharge, which may become blood tinged and a membrane may form on the nasal septum. Signs indicating toxin effect are rare. (3) **Laryngeal:** This may be either an extension of the pharyngeal form or be the only site involved. Symptoms include fever, hoarseness and a barking cough. Development of the membrane may lead to airway obstruction, coma, and death. (4) **Cutaneous**: *C. diphtheriae* can cause clinical skin infections characterized by a scaling rash or by chronic non-healing ulcers with a dirty gray membrane and are often associated with *Staphylococcus aureus* and group A streptococci. This type of Diphtheria is often associated with overcrowding, impoverished groups and homeless persons. Cutaneous sites of *C. diphtheriae* have been shown both to contaminate the inanimate environment and to induce throat infections in others. Bacterial shedding from cutaneous infections continues longer than from the respiratory tract. Because *C. diphtheriae* is usually isolated in association with other known skin pathogens, and because the ulcers do not respond to antitoxin therapy, there is debate as to whether or not the isolates are actually causing clinical illness.
Diagnostics	Diagnosis is usually made based on history and clinical presentation as it is essential to begin therapy as soon as possible. Diphtheria should be suspected

	based on the following clinical clues: • Mildly painful tonsillitis and/or pharyngitis with associated membrane, especially if the membrane extends to the uvula and soft palate; • Adenopathy and cervical swelling, especially if associated with the membranous pharyngitis and signs of systemic toxicity; • Hoarseness and stridor; • Palatal paralysis; • Serosanguinous nasal discharge with associated mucosal membrane; and • Temperature elevation rarely in excess of 39.4ºC (103ºF). The differential diagnosis includes infectious mononucleosis, streptococcal or viral pharyngitis and tonsillitis, Vincent's angina and acute epiglottitis. The role of the laboratory in the diagnosis of Diphtheria is to assist the clinicians in confirming their clinical diagnosis. Diagnosis is confirmed by bacteriologic examination of specimens. Cultures of lesions, if present and the nasopharynx are done to confirm the diagnosis. Swab(s) from the nasopharynx, especially the membrane, is essential. Follow your regional laboratory procedures for testing.
Treatment	**Treatment for Diphtheria should be done in consultation with an Infectious Disease Specialist. The following points are for general guidance only.** For Pharyngeal or Laryngeal Diphtheria, early administration of diphtheria antitoxin is recommended. A single dose of diphtheria antitoxin is indicated to neutralize the circulating diphtheria toxin and should be given in the early stages if Diphtheria is suspected, without waiting for laboratory confirmation. Dosage is based on the degree of disease involvement. Treat with erythromycin for 14 days. Antibiotics are not a replacement for antitoxin. Supportive treatment, in hospital or at home, is advised under strict isolation until two consecutive throat cultures are negative for diphtheria bacilli. These cultures should be taken not less than 24 hours apart and not less than 24 hours after the completion of the course of antibiotics. For Cutaneous Diphtheria, the skin lesions should be cleaned with soap and water and a course of oral antibiotics should be given for a 10 day period. Antitoxin may be of some use in cutaneous disease, because of toxin sequelae. Eligibility for diphtheria antitoxin will be determined through discussion with the Chief Medical Officer of Health (CMOH)/Deputy CMOH. If Diphtheria is suspected, contact your Regional Communicable Disease Coordinator (RCDC) immediately to discuss diphtheria antitoxin.
Pathogen	
Occurrence	**Worldwide**: Diphtheria is typically a disease of colder months in temperate climates. Cutaneous Diphtheria is more common in the tropics where seasonal trends are less distinct. Those affected are most commonly unimmunized children under 15 years of age or groups of adults whose immunization has been neglected. The overall case-fatality rate for Diphtheria has changed very little in the past 50 years and is between 5–10%, with higher rates (up to 20%) among persons younger than 5 or older than 40 years of age. Diphtheria is uncommon in industrialized countries, such as Canada and the United States, where routine immunization has virtually eliminated endemic disease.

	Canada: The diphtheria toxoid was licensed for use in Canada in 1926 and was introduced as routine immunization in 1930. This led to a substantial decline in diphtheria morbidity and mortality. Since 1983, there have been fewer than five cases reported per year and no deaths, with only one case per year in 2002–2004. The majority of cases have occurred in adults without adequate immunization. **Nunavut**: There have been no cases of Diphtheria reported in Nunavut.
Reservoir	Humans
Transmission	The most common modes of spread are via respiratory droplets or direct contact with either respiratory secretions or exudates from infected skin lesions. Close face to face contact with a case or carrier is usually required in order for transmission to occur. Transmission via fomites, raw milk and milk products is rare. Articles soiled with discharges from infected lesions are also potential sources of transmission. Most respiratory disease occurs in the colder months in temperate climates and is associated with crowded indoor living conditions and hot dry air. Sporadic cases most often result from exposure to carriers who are asymptomatic as these carriers are responsible for perpetuating the spread of disease. Exact carriage rates are unknown but in endemic areas 3–5% of healthy individuals may harbour the organism in their throats. Skin infection, which was thought to be primarily a problem in tropical environments, has caused epidemics in Europe and North America among destitute inner city dwellers and substance abusers. Skin carriage can become a silent reservoir for the organism and it has been shown that person to person transmission from infected skin sites is more efficient than from the respiratory tract.
Incubation Period	The incubation period is typically 2-5 days with a range 1-10 days.
Communicability	Transmission may occur as long as virulent bacilli are present in discharges and lesions; 2-4 weeks in untreated individuals. Usually communicability will end within 4 days after the administration of appropriate antibiotics. Occasionally, chronic carriage occurs even after treatment; chronic carriers may shed the organism for 6 months or more.
Susceptibility and Resistance	Routine vaccination is recommended as per the Nunavut publicly funded immunization schedule. Immunization with diphtheria toxoid produces prolonged but not lifelong immunity. Lifelong immunity is generally, but not always, acquired following disease or inapparent infection.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the *Vaccine Preventable Disease Report Form* dated March 2014 or later (section 7.1.2). 1. Treatment of clinical cases should not be delayed until laboratory confirmation. Treatment is under the direction of the attending health care provider in consultation with an Infectious Disease specialist. Diphtheria antitoxin should be administered as soon as possible. Contact the RCDC immediately if Diphtheria is suspected.

	2. Antibiotic therapy is needed to eliminate the organism and prevent spread and is not a substitute for antitoxin. Throat and nasopharyngeal swabs should be taken prior to starting antibiotic therapy. 3. The management of cases involves respiratory isolation until: a. Two cultures from nose, throat or lesions have been taken 24 hours apart and are negative for *C. diphtheriae*. b. Cultures are taken no earlier than 24 hours after completion of antibiotic treatment. 4. Once recovered, the case should receive a complete primary series of diphtheria-containing vaccine according to the Nunavut publicly funded immunization schedule and the age of the case. 5. All bedclothes and clothing articles that have been used in the care of any infected individual should be washed with hot soapy water. 6. Individuals with diagnosed Diphtheria are to be excluded from school, child-care centres and work until two cultures taken from the nose and throat or lesions are negative. These cultures must be taken at least 24 hours apart and taken 24 hours after the completion of antibiotic therapy. Consult with the RCDC.
Contacts	With regard to Diphtheria, contacts are defined as: • Household members; • Persons who have had close face-to-face contact of a case, such as intimate contact, sharing the same room at school or work; • Health care providers exposed to oropharyngeal secretions from the case. 1. All identified contacts should have swabs taken from the nose and throat and sent for culture regardless of immunization status. They should also be started on a prophylactic course of seven days with oral erythromycin or given a single dose of procaine penicillin IM as prophylaxis. 2. Contacts should also be kept under surveillance for seven days for signs and symptoms of Diphtheria. 3. Inadequately immunized contacts should receive appropriate immunization in accordance with the Nunavut publicly funded immunization schedule. 4. Contacts must be excluded from occupations involving food handling, close contact with children under 7 years of age, known immunocompromised persons, care of sick and from school until treatment is complete and cultures from the nose and throat or lesions are negative. Consult with the RCDC. 5. Diphtheria antitoxin is not recommended for prophylaxis of close, unimmunized contacts of Diphtheria cases, given the substantial risk of allergic reaction to horse serum and no evidence of additional benefit of antitoxin for contacts who have received antimicrobial prophylaxis. 6. Complete the *Vaccine Preventable Diseases Contact Investigation Form* dated March 2014 or later (section 7.1.3). Include additional pages for contact information as necessary.
Outbreaks	If a single case of Diphtheria is suspected, contact your RCDC.
Health Education	• Immunize children according to the Nunavut Immunization Schedule. • Healthcare workers should demonstrate proof of immunity when hired (proof of immunity may include history of disease, serological evidence of disease or documented age-appropriate doses of diphtheria-containing vaccine). • Immunize non-immune persons according to the Nunavut Immunization Schedule. • Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and

	sneezing and before preparing foods and eating. • Educate the public about the risks associated with sharing saliva-contaminated items (e.g. cigarettes, food, drinks, lipstick, etc.). • Persons traveling to countries where Diphtheria may continue to circulate should ensure they are immune.
Health Settings Management	
Infection Control Measures in Health Care Settings	Direct and indirect contact
Occupational Health	Gown and gloves if risk of contact with lesion or drainage.
Surveillance	
Case Definition	**Confirmed case:** Clinical illness (see below) or systemic manifestations compatible with diphtheria in a person with an upper respiratory tract infection or infection at another site (e.g., wound, cutaneous) PLUS at least one of the following: **Laboratory confirmation of infection:** • Isolation of *Cornyebacterium diphtheriae* with confirmation of toxin from an appropriate clinical specimen, including the exudative membrane **OR** • Isolation of other toxigenic Cornyebacterium species (*C. ulcerans or C. pseudotuberculosis*) from an appropriate clinical specimen, including the exudative membrane **OR** • Histopathologic diagnosis of diphtheria **OR** • Epidemiologic link (contact within two weeks prior to onset of symptoms) to a laboratory-confirmed case. **Probable Case:** Clinical illness in the absence of laboratory confirmation or epidemiologic link to a laboratory-confirmed case. **Suspect Case:** Upper respiratory tract infection (nasopharyngitis, laryngitis or tonsillitis) with or without a nasal, tonsillar, pharyngeal and/or laryngeal membrane. **Clinical Evidence:** Clinical illness is characterized as an upper respiratory tract infection (nasopharyngitis, laryngitis or tonsillitis) with or without an adherent nasal, tonsillar, pharyngeal and/or laryngeal membrane, plus at least one of the following: • Gradually increasing stridor • Cardiac (myocarditis) and/or neurologic involvement (motor and/or sensory palsies) one to six weeks after onset • Death, with no known cause.
Reporting Requirements and Forms	**Diphtheria is a notifiable infection in Nunavut:** 1. Notify your RCDC. 2. Complete the *Vaccine Preventable Disease Report Form* dated March 2014 or later (section 7.1.2) and the *Vaccine Preventable Diseases Contact*

	Investigation Form, dated March 2014 or later (section 7.1.3). 3. Fax the form, within 24 hours of case notification, to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833 4. If you cannot contact your RCDC, contact the Territorial Communicable Disease Consultant at 867-975-5734.

Tools

Guidelines	Not applicable
Materials & Resources	Fact Sheet: Diphtheria
Cross Reference	Nunavut Immunization Manual: Diphtheria Immunizations sections

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Diphtheria-2011.pdf

Canadian Immunization Guide, Evergreen Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php

Public Health Agency of Canada, 2006. Canadian Immunization Guide, Seventh Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 2, 2014.

7.2 Human Papillomavirus (HPV)

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: No
Reporting: None

Infectious Agent	There are over 100 types of Human Papillomavirus (HPV) with ≥18 being high risk oncogenic types. Up to 40 HPV types infect the genital tract.
Clinical	
Clinical Presentation	Most HPV infections are asymptomatic, subclinical or go unrecognized. Symptoms are virus type dependant and can include: pain, itching, bleeding and presence of warts in the ano-genital area. Late manifestations include cancerous changes to cells of: cervix, anus, penis, oropharynx.
Diagnostics	Women: A pap test screens for abnormal cervical cells and may identify HPV if present. Men: There is no regular HPV screening. Physical examination can identify external HPV lesions such as warts in the genital and adjacent areas.
Treatment	External HPV or genital warts can be treated. Abnormal cellular changes should be referred to a specialist.
Pathogen	
Occurrence	**Worldwide:** HPV is one of the most common sexually transmitted infections. **Canada:** The overall prevalence in Canada is 11% to 29% for any HPV types. **Nunavut**: A study in 2001 identified a prevalence of 26% for oncogenic types of HPV among 1,290 females.
Reservoir	Humans
Transmission	Sexual transmission by direct epithelial (skin or mucosa) to epithelial contact and vertical transmission to an infant exposed to the virus in the maternal genital tract. Subclinical infection may still cause viral transmission to a partner.
Incubation Period	About 2-3 months for genital warts (range is 1-20 months).
Communicability	Unknown. Likely as long as infection persists.
Susceptibility and Resistance	Most HPV infections are self-limiting, clearing within 24 months. Persistent infection with oncogenic types may lead to cancer.
Public Health Management	
Case	No follow-up of reported cases is required.
Contacts	Not applicable
Outbreaks	Not applicable
Health Education	For sexually active people promote use of condoms. Vaccines are available that protect against the types of HPV that cause approximately 70% of cervical cancers. Publicly funded vaccine is available for

	eligible Nunavummiut (see Nunavut Immunization Manual). For those not eligible for the publicly funded program, the vaccine can be purchased privately if recommended. Regular screening should be encouraged per guidelines, i.e. pap smear.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine precautions
Occupational Health	Not applicable
Surveillance	
Case Definition	A positive HPV laboratory result.
Reporting Requirements and Forms	None
Tools	
Guidelines	Not applicable
Materials & Resources	**Fact Sheet: Human Papillomavirus (HPV)**
Cross Reference	Nunavut Immunization Manual: HPV Immunization section

References

Heymann D., editor. Control of communicable diseases manual. 19th ed. Washington: American Public Health Association; 2008.

American Academy of Pediatrics. Report of the Committee on Infectious Diseases. Red Book. Human Papillomaviruses. pp 477-483. 28th Edition. 2009

Healey SM et al. Oncogenic human papillomavirus infection and cervical lesions in Aboriginal women of Nunavut. Canada. Sexually Transmitted Diseases 2001; 28: 694 -700.

Public Health Agency of Canada (2007). Canada Communicable Disease Report: Statement on Human Papillomavirus Vaccine, 33. Source: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/07vol33/acs-02/index-eng.php

Public Health Agency of Canada (2012). Canada Communicable Disease Report: Statement Update on Human Papillomavirus (HPV) Vaccines, 38. Source: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/12vol38/acs-dcc-1/index-eng.php

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on August 6, 2013.

7.3.1 *Haemophilus Influenzae* (Hi), Invasive

Special Precautions/Considerations

Precautions: Droplet and contact

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	*Haemophilus influenzae* are Gram-negative coccobacilli that are divided into unencapsulated (non-typeable) and encapsulated strains. The encapsulated strains are further classified into serotypes a through f.
Clinical	
Clinical Presentation	**(1) *Haemophilus influenzae* type b (Hib) and non-type b (including type a)** Often presents as meningitis, pneumonia, bacteremia and epiglottitis, depending on which part of the body is affected. Other less common illnesses include: endocarditis, osteomyelitis, and gangrene. **(2) *Haemophilus influenzae* non-typeable (NT-Hi)** It is more common to see respiratory tract infections such as otitis media, sinusitis, pneumonia and conjunctivitis. However some non-type b strains can cause disease similar to type b infection.
Diagnostics	It is important to note that **only invasive disease** is reportable. Laboratory criteria for diagnosis requires the isolation of *H. influenzae* by culture from a normally sterile site (e.g. blood or cerebrospinal fluid or, less commonly, joint, pleural or pericardial fluid). Aspirates are usually from sterile sites, and such cases are included in the surveillance definition. An aspirate culture can be obtained through needle aspiration or during a percutaneous drainage procedure. Follow your regional laboratory procedures for diagnostic testing.
Treatment	A discussion of the treatment of invasive Hi is beyond the scope of these guidelines. Consult with physician for treatment.
Pathogen	
Occurrence	**Worldwide:** Prior to the introduction of an effective vaccine, Hib was the leading cause of bacterial meningitis and other invasive bacterial disease among children less than five years of age. Almost all serious Hib infections were in children less than five; two thirds of these cases were in children less than 18 months old. Since the introduction of the Hib conjugate vaccines, there has been a shift of *H. influenzae* to other types. **Canada:** Prior to the introduction of Hib conjugate vaccine in Canada there were approximately 2,000 cases of Hib disease reported annually. From 1995 to 1999 fewer than 65 cases of invasive Hib were reported annually. Of these, the highest numbers were reported in children less than nine years of age and in adults over the age of forty. **Nunavut:** From 1999-2011 there have been 86 cases of Hi with 12 being Hib for a yearly average of 5.01 Hib cases per 100,000. Of the 86 Hi cases, 52 were HI type a (Hia) for a yearly average 14.35 per 100,000. Majority of cases for Hib and Hia were under 2 years of age.
Reservoir	Humans
Transmission	Person-to-person via droplet infection, and direct or indirect contact with discharges from the nose and throat during the infectious period. Typically the nasopharynx is the portal of entry.
Incubation Period	Unknown, possibly 2-4 days.

Communicability	The exact period of communicability is unknown but is thought to be up to 7 days prior to the onset of illness. It may remain communicable for as long as organisms are present in nose and throat. Carriage may occur indefinitely in up to two to five percent of children. Appropriate antibiotic treatment reduces communicability within 24-48 hours.
Susceptibility and Resistance	Susceptibility is assumed to be universal and decreases with age. Children who acquire an invasive Hi infection prior to two years of age may not develop immunity. Risk factors for disease include host factors (chronic diseases) and exposure factors (household crowding, large household size, child care or nursery school attendance, low socioeconomic status, and school-aged siblings).
Public Health Management	
Case	Followup is required for all reports of Invasive *Haemophilus influenza.* Work with the case or proxy to identify and follow all contacts for type a or type b invasive disease and for cases where the type is not yet known. (refer to Contacts section). All other Hi infections e.g. type c to f, do not require contact management. Contact and interview the case. In situations where the case is too young or too ill to be interviewed, information should be obtained from family, health care providers, etc. Complete the *Bacterial Disease Surveillance Form – Haemophilus influenzae* dated March 2014 or later (section 7.3.2).
Contacts	When Hi type a or b or type pending is reported contact your Regional Communicable Disease Coordinator (RCDC) during regular business hours, or the Medical Officer of Health (MOH) on-call if it is outside regular business hours, to determine if chemoprophylaxis for contacts is necessary. **Important Notes**: 1. A contact is defined as anyone living with or has spent 4 or more hours per day with the case, for at least 5 of the 7 days preceding the day of hospital admission of the case. 2. All contacts of Hi type a, b or type pending should be identified and educated about the disease and when to seek medical attention. 3. See below for which contacts should receive chemoprophylaxis. 4. The aim of chemoprophylaxis is to eliminate nasopharyngeal carriage of bacteria and prevent transmission. To effectively prevent secondary spread, prophylaxis should be given concurrently to all contacts and be initiated as soon as possible. If more than 14 days have passed since the last contact with the case, the benefit of prophylaxis is likely to be decreased. 5. Rifampin is the drug of choice for prophylaxis. Refer to Table 1 for dosage guidelines. For contacts of ***Haemophilus influenza type b***: Chemoprophylaxis is recommended as follows: • For all household contacts (as defined above) living in: o Household with at least 1 contact younger than 4 years of age who is unimmunized or incompletely immunized o Household with a child younger than 12 months of age who has not completed the primary Hib series o Household with a contact who is an immunocompromised child, regardless of that child's Hib vaccination status

<table>
<tr><td></td><td>

For preschool and daycare contacts when 2 or more cases of invasive Hi disease have occurred within 60 days.

<u>Chemoprophylaxis is not recommended</u>

For occupants of households with no children younger than 4 years of age (other than the index case);
For occupants of households when all contacts 12 to 48 months of age have completed their Hib immunization series and when household contacts younger than 12 months of age have completed their primary series of Hib immunizations;
For nursery school and child care contacts of one index case, especially those older than 2 years of age;
For pregnant women.

<u>For contacts of Haemophilus influenza type a:</u>

Chemoprophylaxis is not recommended for contacts of Haemophilus influenza type a. However contacts should be identified and educated on signs and symptoms and when to seek medical attention.

<u>For contacts of Haemophilus influenza type pending :</u>

The CMOH will review the case and make a recommendation on prophylaxis based on the time interval until the laboratory is able to report the type and the length of time since the onset of illness in the case.

Table 1: Recommended Chemoprophylaxis Regimens for Contacts*
<table>
<tr><th>Age</th><th>Rifampin Dosage</th></tr>
<tr><td>Adults/children greater and equal to 12 years of age</td><td>600 mg po once daily for 4 days</td></tr>
<tr><td>Children under 12 years of age and older than 1 month of age</td><td>20 mg/kg (maximum 600 mg) po once daily for 4 days</td></tr>
<tr><td>Infants younger than 1 month of age</td><td>10 mg/kg po once daily for 4 days</td></tr>
</table>
*Refer to the Red Book for additional information or for scenarios not presented here (see reference section)

Complete the Invasive Haemophilus influenzae Disease Contact Investigation Form dated March 2014 or later (section 7.3.3). Include additional pages for contact information as necessary.
</td></tr>
<tr><td>Outbreaks</td><td>If even one case is detected, contact your RCDC.</td></tr>
<tr><td>Health Education</td><td>

Provide the family with information about invasive Hi and immunization for Hib. Inform them that a child who has recovered from invasive Hib disease should receive Hib conjugate vaccine because natural infection may not provide adequate protective antibodies.
Promote routine childhood immunization as the most important preventative measure against invasive Hib disease.
Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing and before preparing foods and eating.
Refer to the Canadian Immunization Guide (see References section) for those individuals considered to be at high-risk.

</td></tr>
</table>

Health Settings Management

Infection Control Measures in Health Care Settings	Droplet and contact with respiratory secretions
Occupational Health	Close contacts may require chemoprophylaxis

Surveillance

Case Definition	**Confirmed case:** Clinical evidence of invasive disease with laboratory confirmation of infection: • Isolation of *H. influenzae* from a normally sterile site OR • Isolation of *H. influenzae* from the epiglottis in a person with epiglottitis **Probable Case:** Clinical evidence of invasive disease with laboratory evidence of infection: • Demonstration of *H. influenzae* antigen in cerebrospinal fluid OR • Demonstration of *H. influenzae* DNA in a normally sterile site OR • Buccal cellulitis or epiglottitis in a child < 5 years of age with no other causative organisms isolated
Reporting Requirements and Forms	**Invasive Hi is a notifiable infection in Nunavut:** 1. Complete the *Bacterial Disease Surveillance Form – Haemophilus influenza* (section 7.3.2) and the *Invasive* Haemophilus influenzae *Disease Contact Investigation Form* dated March 2014 or later (section 7.3.3). 2. Fax the form, within 24 hours of case notification, to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833 3. If you cannot contact your RCDC, contact the Territorial Communicable Disease Consultant at 867-975-5734.

Tools

Guidelines	Not applicable
Materials & Resources	**Fact Sheet: *Haemophilus influenzae*, Invasive**
Cross Reference	Nunavut Immunization Manual: *H. influenzae* serotype b (Hib) section

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Haemophilus-influenzae-serotype-b-Invasive-2011.pdf

American Academy of Pediatrics.. Red Book: 2012 Report of the Committee on Infectious Diseases. 29th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2012 (345-352).

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Public Health Agency of Canada, 2006. Canadian Immunization Guide, Seventh Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php

Approval

Approved by Dr. Kim Barker, Chief Medical Officer of Health on April 27, 2016.

7.4.1 Measles (Rubeola)

Special Precautions/Considerations

Precautions: Airborne

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Measles virus.
Clinical	
Clinical Presentation	Prodromal fever, conjunctivitis, coryza, cough, Koplik spots (small spots with white or bluish-white centres on an erythematous base on the buccal mucosa). A characteristic red blotchy rash appears on the third to seventh day; the rash begins on the face and then becomes generalized and lasts 4-7 days. The disease is more severe in infants and in adults than in children. Complications may include otitis media, pneumonia, croup, diarrhea and encephalitis. Note that measles vaccine can produce a mild, non-transmissible and usually subclinical infection. The most frequent reaction (approximately 5% of immunized children) is malaise and fever with or without rash lasting up to 3 days and occurring 7-12 days after vaccination with measles-containing vaccine. It is important to differentiate this vaccine reaction from the clinical presentation of Measles disease.
Diagnostics	Diagnosis of Measles is done by serologic testing and/or culture. • Measles specific IgM serology is the standard test of choice for routine diagnosis and is the first priority in the confirmation of Measles disease. • Demonstration of a significant increase (usually 4-fold rise) in measles specific IgG titre is a reliable alternative serologic method for diagnosis. ○ For IgG serology, **the first (acute) sample** should be obtained as soon as possible after the onset of the rash, and no later than 7 days after. **The second (convalescent) sample** should be collected 10-20 days after the first sample. • All IgM positive sporadic cases with no epidemiological link to a laboratory-confirmed case or recent travel to an endemic area must be confirmed with additional testing such as virus isolation from urine and nasopharyngeal specimens or rise in IgG antibody between acute and convalescent sera. • Nasopharyngeal and urine samples are also used in the diagnosis of Measles. Isolation of measles virus from urine or nasopharyngeal swab is successful in 50-75% of samples submitted provided proper specimen collection, rapid transportation, and processing occur. These specimens should be submitted in addition to blood specimens to confirm Measles. Follow your regional laboratory procedures for serologic and other specimen testing.
Treatment	Supportive treatment as indicated. No specific treatment is available for Measles.
Pathogen	
Occurrence	**Worldwide:** Prior to widespread immunization programs, there were an estimated 100 million cases and 6 million measles deaths each year and epidemics occurred every 2-3 years. Typically, more than 90% of individuals

	were infected by the age of 20. With the introduction of childhood immunization programs in many countries the number of reported Measles cases dropped. Despite the existence of a safe, effective and inexpensive measles vaccine for 40 years, Measles continues to occur throughout the world and remains the leading vaccine-preventable cause of death in children worldwide. **Canada:** Sustained transmission has been eliminated by the current vaccine schedule and high vaccine coverage. However, imported cases continue to occur. Secondary spread from these imported cases is self-limited and often involves unimmunized individuals. Secondary spread to the general population is usually limited. **Nunavut:** Since 2000 there has been one reported case of Measles.
Reservoir	Humans
Transmission	Airborne by droplet spread, direct contact with nasal or throat secretions of infected persons; less commonly by articles freshly soiled with nose or throat secretions. Measles is one of the most highly communicable infectious diseases.
Incubation Period	About 10 days, but may be 7-18 days from exposure to onset of fever (rarely as long as 19-21 days). Average time from exposure to onset of rash is 14 days. Immune globulin (Ig) given for passive protection later than the third day of the incubation period may extend the incubation period.
Communicability	From one day before the beginning of the prodromal period (usually about 4 days before rash onset) to 4 days after the appearance of the rash; minimal after the second day of rash. For those who are immunocompromised, the communicability lasts for the duration of the measles illness. The vaccine virus has not been shown to be communicable.
Susceptibility and Resistance	All persons who have not had the disease or been successfully immunized are susceptible. Acquired immunity after illness is permanent. Infants born to mothers who have had Measles are protected against the disease for the first 6-9 months or more. Maternal antibody interferes with response to vaccine. Immunization at 12-15 months of age induces immunity in 94% to 98% of recipients; re-immunization increases immunity levels to about 99%. Children born to mothers with vaccine-induced immunity receive less passive antibody; they may become susceptible to Measles at an earlier age.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case or guardian. Complete the *Vaccine Preventable Disease Report Form* dated March 2014 or later (section 10.4.2). Work with the case/guardian to compile a list of all susceptible contacts (see Contacts section). All persons (including healthcare workers) with Measles should be excluded from childcare, school, university or work until 4 days after the appearance of the rash. They should strive to remain isolated from susceptible individuals

<table>
<tr><td></td><td>during this time.

If the case travelled during the infectious period, inform Regional Communicable Disease Coordinator (RCDC) and provide case's itinerary so appropriate follow-up can be completed.</td></tr>
<tr><td>Contacts</td><td>Note: The single most important factor in preventing measles outbreaks is the rapid separation of susceptible contacts and infected persons. Immediate reporting, investigation and vaccination of susceptible contacts can prevent secondary cases.

Susceptible contacts:
Vaccination and/or Ig may be required for those who are susceptible and have been exposed (defined as more than 2 hours of close contact) to an infected individual (and who do not have a contraindication to the vaccine).
Note: Ig is a blood product that is obtained through the laboratory if recommended by the Medical Officer of Health (MOH).

The following individuals are considered susceptible:
• Born in or after 1970 and
• No documented evidence of two doses of measles-containing vaccine (the first dose given on or after the first birthday and an interval of at least one month between the two doses) and
• No history of physician-documented measles infection and
• No laboratory evidence of measles immunity OR
• Have HIV or other immune-suppressive conditions

Contact prophylaxis to modify or prevent Measles:
<table>
<tr><th>Contact status</th><th>Prophylaxis recommendation(s)</th></tr>
<tr><td>Infants (0-5 months)</td><td>• Administer Ig within 6 days of exposure (0.25 mL/kg given IM).
• Do not give measles-containing vaccine.</td></tr>
<tr><td>Infants (6-12 months)</td><td>• Administer measles-containing vaccine if within 72 hours of exposure.
• Ig can be considered on a case-by-case basis for those who did not receive measles-containing vaccine within 72 hours of exposure. Consult with the Chief MOH/Deputy Chief MOH. If indicated, administer Ig within 6 days of exposure (0.25 mL/kg given IM).
• When children receive measles-containing vaccine before their first birthday, they must receive the vaccine again on or after their first birthday and then continue with the routine schedule.</td></tr>
<tr><td>Children ≥ 12 months with a history of one dose of measles-containing vaccine</td><td>• Offer a second dose of measles-containing vaccine within 72 hours of exposure (if more than a month has elapsed since first dose).</td></tr>
<tr><td>Unimmunized children ≥ 12 months and susceptible adults</td><td>• Administer measles-containing vaccine within 72 hours of exposure.
• Note that when indicated, vaccine should not be delayed while waiting for serology</td></tr>
</table></td></tr>
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<table>
<tr><td></td><td>
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<tr><td></td><td>results.
• Do not give measles vaccine to pregnant women.</td></tr>
<tr><td>Susceptible household or other contacts for whom the risk of complications is very high (e.g. non-immune pregnant women)</td><td>• Administer Ig (0.25 mL/kg up to a maximum of 15 mL given IM).
• Note that Ig is not indicated for household contacts who have received one dose of vaccine at 12 months of age or older unless they are immunocompromised.</td></tr>
<tr><td>Individuals for whom measles vaccine is contraindicated</td><td>• Administer Ig (0.25 mL/kg up to a maximum of 15 mL given IM).</td></tr>
<tr><td>Immunocompromised persons</td><td>• Administer Ig (0.5 mL/kg up to a maximum of 15 mL given IM).</td></tr>
</table>

Note: Ensure that clients who receive Ig are provided with a written record as per the Canadian Standards Association for Blood and Blood Products
• Post exposure prophylaxis given beyond 6 days is not recommended and not useful in preventing disease. Counseling regarding signs and symptoms of Measles disease and self-reporting is recommended.
• Susceptible contacts that have not received Ig or vaccine should be considered for exclusion from childcare, work or school. Discuss with the CMOH/DCMOH.
• Unless contraindicated, individuals who receive Ig should receive the Measles, Mumps, Rubella (MMR) vaccine later at the intervals specified in accordance with current Nunavut vaccine schedules. MMR vaccination should be delayed between 5-6 months after receiving Ig (depending on the dose given). The MMR vaccine and Ig should never be given at the same time.
• Educate contacts about the signs and symptoms of Measles and what to do if they develop symptoms (isolate themselves and notify their health care provider).
• Follow-up with all contacts within 1 week to confirm they have received appropriate prophylaxis and determine if they have become cases.
• If infection has already occurred, prophylaxis will not prevent or modify disease.
• Complete the Vaccine Preventable Diseases Contact Investigation Form dated March 2014 or later (section 10.4.3). Include additional pages for contact information as necessary.
</td></tr>
<tr><td>Outbreaks</td><td>Contact your RCDC if even a single case of Measles is suspected.</td></tr>
<tr><td>Health Education</td><td>• Educate the case about Measles, including the infectious period (from 1 day before the onset of symptoms, or 3-5 days before the onset of rash, to 4 days after the appearance of the rash and the need for isolation from susceptible contacts and public places during this period.
• Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing and before preparing foods and eating.
• Use of appropriate measles vaccine as per the Nunavut publicly funded immunization schedules.
• There are no known adverse effects of vaccine given to people incubating Measles.</td></tr>
</table>

Health Settings Management

Infection Control Measures in Health Care Settings	Airborne precautions
Occupational Health	All healthcare workers should have one of the following before starting care: • 2 documented vaccinations of MMR regardless of birthdate, including those born before 1970. • A history of laboratory-confirmed infection • Laboratory evidence of immunity. For those health care workers who do not meet the criteria listed above, administer one dose of MMR vaccine to the susceptible healthcare workers immediately (if there are no contraindications) and a 2nd dose 4 weeks later (if 2 doses are indicated). Non-immune caregivers or caregivers with unknown immune status must wear fitted N95 respirators on room entry. MMR vaccination should be offered to all non-immune care givers.

Surveillance

Case Definition	**Confirmed case:** Laboratory confirmation of infection in the absence of recent immunization with measles-containing vaccine: • Isolation of measles virus from an appropriate clinical specimen **OR** • Detection of measles virus RNA **OR** • Seroconversion or a significant (e.g. fourfold or greater) rise in measles IgG titre, by any standard serologic assay, between acute and convalescent sera **OR** • Positive serologic test for measles IgM antibody using a recommended assay in a person who is either epidemiologically linked to a laboratory-confirmed case or has recently traveled to an area of known measles activity **OR** • Clinical illness in a person with an epidemiologic link to a laboratory-confirmed case **Probable Case:** Clinical illness: • In the absence of appropriate laboratory tests **OR** • In the absence of an epidemiologic link to a laboratory-confirmed case **OR** • In a person who has recently traveled to an area of known measles activity
Reporting Requirements and Forms	**Measles is a notifiable infection in Nunavut:** 1. Notify your RCDC. 2. Complete the *Vaccine Preventable Disease Report Form* dated March 2014 or later (section 10.4.2) and the *Vaccine Preventable Diseases Contact Investigation Form* dated March 2014 or later (section 10.4.3). 3. Fax the form, within 24 hours of case notification, to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833 4. If you cannot contact your RCDC, contact the Territorial Communicable Disease Consultant at 867-975-5734.

Tools

Guidelines	Not applicable
Materials & Resources	**Fact Sheet: Measles**
Cross Reference	Nunavut Immunization Manual: Measles, Mumps, Rubella (MMR) Immunization and Immune Globulin section Nunavut Immunization Manual: Measles Immunization and Immune Globulin section

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Measles-2011.pdf

Public Health Agency of Canada, 2012. Canadian Immunization Guide, Evergreen Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on May 16, 2013.

7.5.1 Mumps

Special Precautions/Considerations

Precautions: Droplet and direct contact

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Mumps virus, an RNA virus.
Clinical	
Clinical Presentation	Symptoms include fever, swelling and tenderness of one or more salivary glands, usually the parotid and sometimes the sublingual or submaxillary glands. Approximately one-third of infections do not cause clinically apparent salivary gland swelling and may manifest primarily as respiratory tract infection. Orchitis is a common complication after puberty but sterility rarely occurs; other rare complications include arthritis, thyroiditis, mastitis, glomerulonephritis and myocarditis.
Diagnostics	Diagnosis of mumps is done by serologic testing (mumps IgM and IgG) and/or culture. IgM antibodies are usually present at the onset of illness (when glands are swollen) and reach a maximum level one week later. They may be present for several weeks or months following the illness, and decline with time (usually four to eight weeks). Recent vaccination with mumps vaccine or Measles, Mumps, Rubella (MMR) can elicit a mumps IgM antibody response. IgG antibodies are also detectable at the onset of illness reaching a peak in convalescence, then slowly declining over many years or decades. Recent data shows that mumps IgM antibody can be negative or indeterminate or the IgM response delayed in symptomatic individuals previously vaccinated with one or two doses of mumps-containing vaccine at the appropriate intervals. Mumps may also be confirmed by isolation of the virus in cell culture inoculated with throat washings (nasopharyngeal swab), saliva, urine or CSF, or by the detection of viral RNA by PCR in these samples. During an epidemic, the clinical diagnosis of Mumps is straightforward, however when cases are sporadic the clinical diagnosis is less reliable. Follow your regional laboratory procedures for serologic testing.
Treatment	Supportive treatment as indicated. No specific treatment is available for Mumps.
Pathogen	
Occurrence	**Worldwide**: Mumps is endemic throughout the world especially in heavily populated areas. The disease may also occur in epidemics where many unimmunized persons are crowded together. Mumps may occur at any age, however, the majority of reported cases are in children 5-10 years of age. **Canada:** The number of reported cases has decreased by more than 99% since the licensure of Mumps vaccine in 1969. Approximately 500 cases of Mumps are reported annually in Canada. Outbreaks of Mumps have occurred in Nova Scotia, New Brunswick, PEI, Newfoundland, Quebec, Ontario,

	Manitoba, Alberta, and British Columbia starting in early 2007 and continuing into 2008. The majority of cases were among individuals attending post-secondary institutions. **Nunavut:** Since 2000 there have been 2 cases of Mumps.
Reservoir	Humans
Transmission	Person-to-person through direct contact with respiratory droplets from the mouth or nose of an infected person. The mumps virus can also survive on surfaces (fomites); contact with these surfaces followed by contact with the nose or mouth can also result in infection.
Incubation Period	Average length is 16-18 days, however can range from 14-25 days.
Communicability	From 6-7 days before the onset of symptoms and for as long as 9 days after illness onset. Maximum infectiousness occurs between 2 days before and 4 days after onset of illness.
Susceptibility and Resistance	Universal susceptibility. Disease (with or without symptoms) confers permanent immunity. Most individuals born in Canada before 1970 are believed to have likely been infected and can be considered immune. Immunization with mumps-containing vaccine provides approximately 80% protection against Mumps disease. Mumps infection in adulthood generally produces more severe disease. Disease is uncommon in children less than one year of age.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case or guardian. Complete the *Vaccine Preventable Disease Report Form* dated March 2014 or later (section 7.5.2). Individuals with or without documented mumps immunization should be excluded from school, work, etc. for 5 days from the date of parotitis onset (the day of onset of parotitis is day 1). Health care workers, regardless of immunization status should be excluded from school, work, etc. for 5 days after parotitis onset (the day of onset of parotitis is day 1).
Contacts	A contact of a Mumps case is any susceptible person who has had close contact with the case during the period of communicability. **Susceptible contacts**: The following individuals are considered susceptible: • Individuals born in or after 1970. • Individuals without documented evidence of two doses of mumps-containing vaccine (the first dose given on or after the first birthday and an interval of at least one month between the two doses). • Individuals without a history of physician-documented mumps infection. • Individuals without laboratory evidence of mumps immunity. **Contact management**: • Assess the vaccination status of identified contacts and immunize where appropriate. • Alert contacts about signs and symptoms that can occur within 25 days

	after exposure. • Advise the contact to seek medical attention should symptoms develop. • Susceptible contacts that refuse vaccination may be considered for exclusion from school, etc. until at least 26 days after the onset of parotitis in the last person with Mumps in the affected site. Excluded contacts may return immediately after vaccination. • Complete the *Vaccine Preventable Diseases Contact Investigation Form* dated March 2014 or later (section 7.5.3). Include additional pages for contact information as necessary.
Outbreaks	Contact your Regional Communicable Disease Coordinator (RCDC) if even a single case of Mumps is suspected.
Health Education	• Educate the case about Mumps, including the infectious period (from 7 days before the onset of symptoms to 9 days after the onset of parotitis). and the need for isolation from susceptible contacts and public places during this period. • Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing and before preparing foods and eating. • Educate the public about the risks associated with sharing saliva-contaminated items (e.g. cigarettes, food, drinks, lipstick, etc.). • Use of appropriate mumps-containing vaccine as per the Nunavut publicly funded immunization schedule. • Travelers to areas with Mumps activity should ensure they are immune.
Health Settings Management	
Infection Control Measures in Health Care Settings	Droplet and direct contact. Droplet precautions for exposed susceptible patients should begin 10 days after first contact and continue through 26 days after last exposure.
Occupational Health	Procedure mask should be worn by susceptible caregivers within 1 meter of patient. Gown and gloves if risk of exposure to secretions. MMR vaccination for all non-immune caregivers. Healthcare worker immune status should be known before starting care.
Surveillance	
Case Definition	**Confirmed case:** Clinical illness and laboratory confirmation of infection in the absence of recent immunization with mumps-containing vaccine: • Isolation of mumps virus from an appropriate clinical specimen **OR** • Detection of mumps virus RNA **OR** • Seroconversion or a significant (e.g. fourfold or greater) rise in mumps IgG titre, by any standard serologic assay, between acute and convalescent sera **OR** • Positive serologic test for mumps IgM antibody using a recommended assay in a person who is either epidemiologically linked to a laboratory-confirmed case or has recently traveled to an area of known mumps activity **OR** • Clinical illness in a person with an epidemiologic link to a laboratory-confirmed case **Probable Case:** Clinical illness:

	• In the absence of appropriate laboratory tests **OR** • In the absence of an epidemiologic link to a laboratory-confirmed case
Reporting Requirements and Forms	**Mumps is a notifiable infection in Nunavut:** 1. Complete the *Vaccine Preventable Disease Report Form* dated March 2014 or later (section 7.5.2) and the *Vaccine Preventable Diseases Contact Investigation Form* dated March 2014 or later (section 7.5.3). 2. Fax the form, within 7 days of case notification, to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833

Tools

Guidelines	Not applicable
Materials & Resources	**Fact Sheet: Mumps**
Cross Reference	Nunavut Immunization Manual: Mumps Immunization section

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Measles-2011.pdf

Public Health Agency of Canada, 2006. Canadian Immunization Guide, Seventh Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 2, 2014.

7.6.1 Pertussis

Special Precautions/Considerations

Precautions: Droplet

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Pertussis is an acute bacterial infection of the respiratory tract caused by *Bordetella pertussis*.
Clinical	
Clinical Presentation	In classical pertussis, there are three clinical stages of the disease: **Pertussis stage** / **Clinical presentation** / **Approximate length** Stage 1: Catarrhal — Insidious onset runny nose, possible fever and mild, occasional cough (which gradually becomes more severe). — Usually 7-10 days (range 4-21 days) Stage 2: Paroxysmal — Paroxysms of numerous, rapid coughs due to difficulty expelling thick mucous from the tracheobronchial tree; each series has many coughs without intervening inhalation and can be followed by characteristic high-pitched inspiratory "whoop". Paroxysms frequently end with expulsion of clear, tenacious mucous, often followed by vomiting and exhaustion or periods of apnea. Paroxysmal attacks: • Occur frequently at night, with an average of 15 attacks per 24 hours. • Increase in frequency during the first 1-2 weeks, remain at the same frequency for 2-3 weeks and then gradually decrease. — Usually 1-6 weeks; may persist up to 10 weeks Stage 3: Convalescent — Gradual recovery with possible setbacks; cough becomes less paroxysmal and disappears. — Usually 7-10 days (range 4-21 days) In infants less than 6 months of age, partially vaccinated children, adolescents and adults, classical symptoms may not be present.
Diagnostics	B. pertussis nasopharyngeal (NP) specimens can be tested by PCR to detect pathogen. Follow your regional lab procedures. Use the specimen collection kit that is specific for pertussis. Swab early in the course of illness. Do not collect a pertussis swab on patients if it is > 4 weeks after onset of illness. Do not collect a swab on treated patients if they have been on treatment for more than 1 week Do not collect an NP swab in the same room where pertussis-containing vaccine is being given as it may render a false positive result.
Treatment	Antibiotics should be administered as soon as possible after the onset of illness. Treatment eradicates B. pertussis from the nasopharynx but has no effect on

the clinical symptoms or course of pertussis, unless given in the early (incubation period, catarrhal or early paroxysmal) stages of infection. There is no limit to the start date for treatment of confirmed cases of pertussis. Recommended medications for treatment and prophylaxis are outlined in the table that follows. Any of the following can be used for the treatment of pertussis.

Antibiotic	Dosage	Comments
Azithromycin	Children: 10 mg/kg PO daily for 1 day (max of 500mg); THEN 5 mg/kg PO daily for 4 days to a maximum of 250mg/day. Adults: 500 mg po daily for 1 day; THEN 250 mg PO daily for 4 days.	
Clarithromycin	Children: 15 mg/kg/day divided into 2 doses PO for 7 days to a maximum of 1000 mg/day. Adults: 1000 mg XL PO once daily x 7 days.	Not recommended in pregnancy.
Trimethoprim-sulfamethoxazole (Bactrim or Septra)	Children: 8 mg/kg/day divided into 2 doses TMP PO for 10 days. Adults: Bactrim DS PO bid for 10 days.	Not for use in < 2 months of age.
Note that the dosage regimen is the same for prophylaxis as for treatment. Guidance regarding who may require prophylaxis is included in the Contact section below.		

Pathogen

Occurrence	**Worldwide**: Pertussis is considered endemic and common to children, with an incidence in children under 15 less than 1 per 100,000. Despite vaccination programs, globally there were still an estimated 48.5 million cases and an estimated 295,000 deaths (predominantly in Africa). **Canada**: With the introduction of whole-cell pertussis vaccine in 1943, there has been a significant decline in disease incidence from an average of 165 cases per 100,000 person-years prior to 1935 to 4 per 100,000 person-years from 2007-2011. Pertussis is a cyclical disease and peaks at 2-5 year intervals, thus outbreaks continue to occur. From January to mid-August 2012, Canada experienced a 3.6 fold increase in reported cases. **Nunavut**: From 2001-2015 there were between 0 to 6 cases per year, with the exception of one recorded outbreak in 2009 totalling 25 cases. Cases were generally reported in those less than 1 year old.
Reservoir	Humans. Adults and adolescents are considered to play a major role in the transmission of infection to infants and children.
Transmission	Direct contact with discharges from the respiratory mucous membranes of infected persons by the airborne route, probably via large droplets. In vaccinated populations, bacteria are frequently brought home by an older sibling or a parent. Indirect spread through the air or contaminated objects occurs rarely if at all.

Incubation Period	Average 9-10 days (range 6-20 days).
Communicability	Pertussis is highly communicable, with a secondary attack rate of 80-90% among susceptible household contacts. It is most communicable in the early catarrhal stage and the beginning of the paroxysmal stage (i.e. the first 2 weeks of infection). Communicability then decreases and becomes negligible about 3 weeks after the onset of typical paroxysms in untreated individuals. Individuals treated with appropriate antibiotics can be considered non-infectious after 5 days of compliant treatment. Individuals may continue to have persisting cough after they are no longer infectious.
Susceptibility and Resistance	Susceptibility of non-immunized individuals is universal; partially immunized individuals are also susceptible. Previously immunized adolescents and adults are also susceptible due to waning immunity; these individuals are often a source of infection for partially or non-immunized young children. The incidence of pertussis in Canada is highest in infants and children, and decreases in those older than 14 years. Recent evidence suggests that immunity from B. pertussis infection may not be permanent, therefore people who have had pertussis should still receive all pertussis-containing doses according to the Nunavut Immunization schedule.
Public Health Management	
Case	Determine if the patient meets the case definition for pertussis. See case definitions under the Surveillance section. Complete the *Vaccine Preventable Disease Report Form* dated May 2016 or later (section 12.0). During outbreak situations, enhanced case investigation forms may be used. Confirmed and probable cases of pertussis should be started on treatment as soon as possible. There is no limit to the start date for treatment of symptomatic, untreated cases of pertussis who are PCR positive. Treatment is under the direction of the attending health care provider. Advise cases to avoid contact with young children, infants and women in their third trimester of pregnancy (especially those who have not been immunized), until the completion of 5 days of appropriate antibiotic therapy or 21 days post cough onset. Exclusion is not a proven effective strategy in pertussis control. However, at the discretion of the Chief Medical Officer of Health (CMOH)/Deputy CMOH it can be recommended that cases be excluded from work, school, etc. if there are vulnerable* people present as follows: • Until 5 days after the start of antibiotic therapy, OR • If there is no treatment or treatment is incomplete, until 3 weeks (21 days) from onset of paroxysmal cough or until cough resolution (whichever comes first). ***** vulnerable individuals are defined as: • Infants less than 1 year of age, regardless of their immunization status. • Pregnant women in their third trimester. • Immuno-compromised individuals.

Contacts	Collect information on potential contacts using the *Vaccine Preventable Disease (VPD) Contact Investigation Form* (May 2016). Include additional pages for contact information as necessary. **A. Contact identification** Identify contacts who had the following types of **exposure** to a confirmed or probable case of pertussis during the period of communicability (i.e from start of catarrhal stage): • Shared respiratory secretions • Face-to-face exposure for greater than 5 minutes • Shared confined air (within 1 meter) for greater than one hour **Household contacts** • All individuals who live in the home including attendees at family daycare centres • Individuals who visit the household daily. **Close non-household contacts** • Will be assessed on a case-by-case basis in consultation with the RCDC. **B. Contact Management** Contacts and parents of contacts should be instructed about disease transmission as well as signs and symptoms of pertussis so that early diagnosis and treatment can be initiated when needed. All contacts should be assessed for symptoms of pertussis. Symptomatic contacts should be referred for clinical assessment and testing. **Immunization** The pertussis immunization status of all contacts should be reviewed and pertussis-containing immunization should be provided if the contact is not up-to-date. This includes contacts with a history of pertussis infection because past infection with pertussis is not a guarantee of immunity. **Chemoprophylaxis** There is no evidence that antibiotic prophylaxis of contacts changes the epidemic course of pertussis in the community, however all contacts should be followed up and assessed taking into account the definitions for vulnerable individuals, exposure and contacts. Additional risk groups may be identified for prophylaxis during an outbreak or at the discretion of the CMOH. Vulnerable individual: see definition in Case section. **Contacts for whom chemoprophylaxis is recommended:** Chemoprophylaxis is recommended for the following high-risk contacts regardless of immunization status or age: • All pregnant women in their third trimester • All infants <1 year of age • Immunocompromised individuals • All household contacts IF there is a pregnant women in the third trimester or an infant <1 year of age in the household. Note: If the case is the only vulnerable person in the household, contact prophylaxis is not indicated for the other household members.

	Contacts for whom chemoprophylaxis is not recommended: • Households that do not have one of the above-listed high-risk individuals present. • Non-household contacts unless the contact is a vulnerable individual. Antibiotic dosages and schedule used for treatment is also used for prophylaxis (refer to the Treatment section). Prophylaxis should be implemented as soon as possible, and is unlikely to be of any benefit if started more than 21 days since the first contact with the case. Infants born to mothers who have had confirmed pertussis in the 2-3 weeks prior to delivery have an extremely high risk of disease. Chemoprophylaxis for the newborn should be discussed with the CMOH/DCMOH. Chemoprophylaxis for other contacts may be recommended at the discretion of the CMOH/DCMOH. **Healthcare Workers** Healthcare Providers who meet the exposure criteria should be identified and assessed. • If symptomatic, test and treat as appropriate. Exclude until 5 days after antibiotics have been started. Note that use of a mask is not sufficient and exclusion is necessary. • If asymptomatic and pertussis immunization is up to date: no exclusion or prophylaxis is required. • If asymptomatic and pertussis immunization is not up to date: immunize and do not exclude from work. Monitor for symptoms. • If asymptomatic and refusing immunization, provide prophylaxis and do not exclude from work. Monitor for symptoms. **Child Care Settings** If the case was in a child care setting, contact the child care setting twice weekly (or as directed by the CMOH) for a three week period following last contact with the case during the period of communicability to determine if there are ill children or staff. Continue until there has been a three week period with no cases.
Outbreaks	If a higher than normal amount of disease activity is detected, contact your Regional Communicable Disease Coordinator (RCDC).
Health Education	• Educate the public about the risks of pertussis infection, especially to infants. • Educate the public about respiratory etiquette i.e., coughing into tissues, hand washing following coughing, etc. • Immunization is the cornerstone for the control of pertussis. • Primary immunization and booster doses with an acellular pertussis-containing vaccine should be provided as per current Nunavut immunization policies.
Health Settings Management	
Infection Control Measures in Health Care Settings	Droplet precautions. Encourage the patient to cover their cough and dispose of used tissues.
Occupational Health	Procedure mask when within 1 meter of patient.

Surveillance

Case Definition	**Confirmed case**
	Laboratory confirmation of infection:
	• detection of *B. pertussis* DNA from an appropriate clinical specimen **AND** one or more of the following:
	  • cough lasting 2 weeks or longer
	  • paroxysmal cough of any duration
	  • cough with inspiratory "whoop"
	  • cough ending in vomiting or gagging, or associated with apnea **OR**
	Epidemiologic link to a laboratory-confirmed case **AND** one or more of the following for which there is no other known cause:
	  • paroxysmal cough of any duration
	  • cough with inspiratory "whoop"
	  • cough ending in vomiting or gagging, or associated with apnea
	
	Probable case
	Cough lasting 2 weeks or longer in the absence of appropriate laboratory tests and not epidemiologically linked to a laboratory-confirmed case **AND** one or more of the following, with no other known cause:
	  • paroxysmal cough of any duration
	  • cough with inspiratory "whoop"
	  • cough ending in vomiting or gagging, or associated with apnea
	
	Suspect case
	One or more of the following, with no other known cause:
	  • paroxysmal cough of any duration
	  • cough with inspiratory "whoop"
	  • cough ending in vomiting or gagging, or associated with apnea

Reporting Requirements and Forms	**Pertussis is a notifiable infection in Nunavut:**
	1. Notify the RCDC.
	2. Complete the *Vaccine Preventable Disease Report Form* dated May 2016 or later (section 7.6.2) and the *Vaccine Preventable Diseases Contact Investigation Form* dated March 2014 or later (section 7.6.3).
	3. Fax the form, within 24 hours of case notification, to the RCDC as follows:
	  • Kitikmeot: 867-983-4088
	  • Kivalliq: 867-645-8272
	  • Qikiqtaaluk: 867-975-4833
	4. If you cannot contact your RCDC, contact the Territorial Communicable Disease Coordinator at 867-975-5734.

Tools

Guidelines	Not applicable
Materials & Resources	**Fact Sheet: Pertussis**
Cross Reference	Nunavut Immunization Manual: Pertussis Immunization sections

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Pertussis-2011.pdf

BC Centre for Disease Control. Communicable Disease Control Management of Specific Diseases. Pertussis. Available online at: http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Epid/CD%20Manual/Chapter%201%20-%20CDC/EPI_Guideline_CDChapt1Pertussis_20100625.pdf

Centers for disease control and prevention. Pertussis. Available online at: http://www.cdc.gov/pertussis/

Heymann D, editor. Control of communicable diseases manual. 19th ed. Washington: American Public Health Association; 2008.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Public Health Agency of Canada, Center for Immunization and Respiratory Infectious Diseases. Pertussis in Canada Epidemiological Summary, 2012. (Internal document).

Approval

Approved by Dr. Kim Barker, Chief Medical Officer of Health on August 8, 2016.

7.6.5 Pertussis Outbreak Management Protocol

Special Precautions/Considerations

Precautions: Droplet

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Pertussis Outbreak Definition	One or more laboratory confirmed cases of pertussis in a community while there is ongoing Pertussis activity in the Territory and as declared by the CMOH. The community outbreak will be declared over by the CMOH after 5 weeks with no new cases or at the discretion of the CMOH. Revert to the regular Pertussis Protocol in the CDC Manual at that time.
Infectious Agent	Pertussis is an acute bacterial infection of the respiratory tract caused by *Bordetella pertussis*.

Clinical

Clinical Presentation

In classical pertussis, there are three clinical stages of the disease:

Pertussis stage	Clinical presentation	Approximate length
Stage 1: Catarrhal	Insidious onset runny nose, possible fever and mild, occasional cough (which gradually becomes more severe).	Usually 7-10 days (range 4-21 days)
Stage 2: Paroxysmal	Paroxysms of numerous, rapid coughs due to difficulty expelling thick mucous from the tracheobronchial tree; each series has many coughs without intervening inhalation and can be followed by characteristic high-pitched inspiratory “whoop”. Paroxysms frequently end with expulsion of clear, tenacious mucous, often followed by vomiting and exhaustion or periods of apnea. Paroxysmal attacks: • Occur frequently at night, with an average of 15 attacks per 24 hours. • Increase in frequency during the first 1-2 weeks, remain at the same frequency for 2-3 weeks and then gradually decrease. In infants less than 6 months of age, partially vaccinated children, adolescents and adults, classical symptoms may not be present. **Note:** the previous outbreak and recently published evidence confirms that a significant number of pertussis cases DO NOT develop classic paroxysmal attacks. In an outbreak setting cough for more than 1 week should be enough to raise suspicion of pertussis.	Usually 1-6 weeks

	Stage 3: Convalescent	Gradual recovery with possible setbacks; cough becomes less paroxysmal and disappears.	May persist up to 10 weeks or longer

Diagnostics

Nasopharyngeal (NP) specimens are tested for *Bordetella pertussis* by PCR. Following your regional lab procedures, use the specimen collection kit that is specific for pertussis. Ensure an adequate quantity of testing kits are available throughout the outbreak. Note* pertussis testing kits have a short expiry date, manage accordingly.

Testing for *Bordetella pertussis*:

If any patient presents with symptoms suspicious of pertussis (at a minimum running nose and cough, with or without fever) swab prior to treatment.

- Use the metal NP swab in the pertussis collection kit or alternatively you may use a thin, nylon soft tipped swab. Insert the swab into the pertussis media for PCR testing. Indicate on the Dynacare requisition testing is for *Bordetella pertussis*.
- Do not collect a pertussis swab on *untreated* patients if it *is more than 4 weeks* after onset of illness. Do not collect a swab on *treated* patients if they have been on treatment for more than 1 week.
- You may collect a swab if they have been on treatment less than 1 week.
- Do not collect an NP swab in the same room where pertussis containing vaccine is being given as it may render a false positive result. The pertussis PCR test is very sensitive

Testing for other respiratory viruses during the respiratory season

RSV, influenza and other viruses may also be circulating in the region. Per CMOH recommendation you may also be directed to collect swabs for a full respiratory viral panel preferably within 72 hours of symptom onset. This will provide a clearer diagnosis in an outbreak situation as other respiratory viruses may be circulating. If patients present with respiratory symptoms that do not fit the pertussis profile, do a random sampling of these ill cases using a regular NP swab, then submit those specs for a Respiratory Direct Viral Panel

Please continue to follow any of the testing recommendations per the disease specific CD protocols, unless directed differently by the CMOH.

Once you know what is circulating in your community (e.g. RSV or influenza) you no longer need to collect further respiratory panel specimens unless:

- You are directed to collect a NP specimen by your community physician for clinical management reasons
- You notice a difference in the clinical presentation of respiratory cases, and think something new is circulating.
- You are directed to collect further specimens by the CMOH.

Tips for NP swab for respiratory viral panel (RSV, influenza A and B etc.)

- Use the regular, larger tipped swab in adults and children who can tolerate it.
- For infants and toddlers, naso-pharyngeal aspirate may be collected in a sterile container and the bigger swab tip may then be dipped in the aspirate, and inserted into the pink viral media. Indicate on the

<table>
<tr><td></td><td>Dynacare requisition that testing is for a Respiratory Direct Viral Panel.
• Thin, plastic flexible NP swabs may also be used in place of the larger tipped swabs for a Respiratory Viral Panel</td></tr>
<tr><td>Treatment & Prophylaxis</td><td>Antibiotics should be administered per the Public Health Management Section.

Treatment eradicates Bordetella pertussis from the nasopharynx but has no effect on the clinical symptoms or course of pertussis, unless given early. There is no limit to the start date of treatment of laboratory confirmed cases of pertussis. However there is no benefit to treatment after three weeks of paroxysmal coughing.

Recommended Treatment and Prophylaxis for Pertussis
<table>
<tr><th>Antibiotic</th><th>Dosage</th><th>Comments</th></tr>
<tr><td>Azithromycin</td><td><u>Infants under the age of six months:</u>
10mg/kg PO daily for 5 days
<u>Children</u>:
10 mg/kg PO daily for 1 day (max of 500mg); THEN 5 mg/kg PO daily for 4 days to a maximum of 250mg/day.
<u>Adults</u>:
500 mg po daily for 1 day; THEN 250 mg PO daily for 4 days.</td><td></td></tr>
<tr><td>Clarithromycin</td><td><u>Children</u>:
15 mg/kg/day divided into 2 doses PO for 7 days to a maximum of 1000 mg/day.
<u>Adults</u>:
1000 mg XL PO once daily x 7 days.</td><td>Not recommended in pregnancy.</td></tr>
<tr><td>Trimethoprim-sulfamethoxazole (Bactrim or Septra)</td><td><u>Children</u>:
8 mg/kg/day divided into 2 doses TMP PO for 10 days.
<u>Adults</u>:
Bactrim DS PO bid for 10 days.</td><td>Not for use in < 2 months of age.</td></tr>
</table></td></tr>
<tr><td colspan="2">Pathogen</td></tr>
<tr><td>Reservoir</td><td>Humans. Adults and adolescents are considered to play a major role in the transmission of infection to infants and children.</td></tr>
<tr><td>Transmission</td><td>Direct contact with discharges from the respiratory mucous membranes of infected persons by the airborne route, probably via large droplets.

In vaccinated populations, bacteria are frequently brought home by an older sibling or a parent.

Indirect spread through the air or contaminated objects occurs rarely.</td></tr>
<tr><td>Incubation Period</td><td>Average 9-10 days (range 6-20 days).</td></tr>
<tr><td>Communicability</td><td>Pertussis is highly communicable from the start of the catarrhal stage until up to 21 days after the onset of cough, with a secondary attack rate of 80-90% among susceptible household contacts. It is most communicable in the early catarrhal stage and the beginning of the paroxysmal stage (i.e. the first 2 weeks of infection). Communicability then decreases and becomes negligible about 3 weeks after the onset of typical paroxysms in untreated individuals.</td></tr>
</table>

	Individuals treated with appropriate antibiotics can be considered non-infectious after 5 days of compliant treatment. Individuals may continue to have a persistent cough after they are no longer infectious.
Susceptibility and Resistance	Susceptibility of non-immunized individuals is universal; partially immunized individuals are also susceptible. Previously immunized adolescents and adults are also susceptible due to waning immunity; these individuals are often a source of infection for partially or non-immunized young children. The incidence of pertussis in Canada is highest in infants and children, and decreases in those older than 14 years. Recent evidence suggests that immunity from *Bordetella pertussis* infection may not be permanent therefore people who have had a diagnosis of pertussis should continue to receive all pertussis-containing doses according to the Nunavut Immunization Schedule.
Public Health Management in an outbreak	
Case	**<u>See also Pertussis CASE Management Algorithm and Worksheet</u>** **<u>Case identification:</u>** Clinically assess all individuals who present with symptoms compatible with pertussis as soon as possible. Obtain details of symptoms, date of onset and history of exposure to a case of pertussis during the period of communicability. Determine if the patient meets the case definition for **confirmed**, **probable**, **suspect or possible** pertussis, (as per case definitions under the Surveillance Section). It is not necessary to test or retest confirmed cases including epi-linked cases who have not been lab confirmed. Test all **probable, suspect** and **possible** cases if not already tested. Initiate an *Enhanced* Pertussis Case Report for all **confirmed, probable and suspect cases.** **<u>Case Management:</u>** Note that an **indeterminate** lab result can be considered positive if the case meets the clinical criteria for pertussis. <u>Confirmed, probable and suspect cases</u> Treat all **confirmed, probable and suspect cases** of pertussis as soon as possible. Ensure all cases are brought up to date (UTD) with age appropriate pertussis containing vaccine. Future doses should be given as per the NU Immunization Schedule. Refer to the relevant pertussis vaccine protocols in the Nunavut Immunization Manual and the Quick Guide to Pertussis Immunization During

	Increased Pertussis Activity in Nunavut. Educate the case about pertussis and prevention of transmission. Advise cases to avoid contact with young children, infants and women in their third trimester of pregnancy, until the completion of 5 days of appropriate antibiotic therapy or 21 days post cough onset. Exclusion is not a proven effective strategy in pertussis control. However, at the discretion of the Chief Medical Officer of Health (CMOH)/Deputy CMOH it can be recommended that cases be excluded from work, school, etc. if there are vulnerable people present as follows: • Until 5 days after the start of antibiotic therapy, OR • If there is no treatment or treatment is incomplete, until 3 weeks (21 days) from onset of paroxysmal cough or until cough resolution (whichever comes first). <u>Possible Cases</u> Test all possible cases. Do not treat them unless the lab report comes back positive for pertussis or unless the individual requires prophylaxis as a contact. If the lab result is negative for pertussis, reassess symptoms, compare against the case definitions and reclassify and manage accordingly. Do not report to the RCDC or follow-up contacts unless the individual becomes a case.
Contacts	**See also Pertussis CONTACT Management Algorithm** Note the following **key points**: • The primary objective of post exposure prophylaxis (PEP) for pertussis is to protect individuals at increased risk of disease i.e. vulnerable individuals • There is no data to indicate that widespread use of PEP among contacts effectively controls or limits the scope of pertussis outbreaks. • Judicious use of antibiotics is an important consideration. **Contact identification** Identify **household contacts** and all **vulnerable individuals** that had **exposure** to a **confirmed, probable or suspect case** of pertussis during the period of communicability (i.e. from start of catarrhal stage to 21 days after the onset of cough): **Household contacts include:** • All individuals who live in the home including attendees at family daycare centres • Individuals who visit the household daily. **Vulnerable Individuals include:** • Infants less than 1 year of age, regardless of their immunization status. • Pregnant women in their third trimester, regardless of immunization status.

- Immune compromised individuals, regardless of immunization status.

Exposure includes:

- Shared respiratory secretions
- Face-to-face exposure for greater than 5 minutes
- Shared confined air (within 1 meter) for greater than one hour

Document information on contacts of cases in households with a vulnerable individual and non-household vulnerable individuals using the *Enhanced Pertussis Contact Investigation Form* (May 2016) or later. Include additional pages for contact information as necessary.

Contact Management

Contacts for whom chemoprophylaxis is recommended:
Chemoprophylaxis is recommended for the following contacts regardless of immunization status or age:

- All vulnerable individuals who are contacts
- All household contacts ONLY IF there is a vulnerable person in the household UNLESS the vulnerable individual is the only case in the household.

Contacts for whom chemoprophylaxis is <u>not</u> recommended:

- Households that do not contain a vulnerable individual.

Antibiotic dosages and schedule used for treatment is also used for prophylaxis (refer to the Treatment section). **Prophylaxis of contacts should be implemented as soon as possible, but not more than 21 days since the first contact with the case.**

Infants born to mothers who have had confirmed pertussis in the 2-3 weeks prior to delivery have an extremely high risk of disease. Chemoprophylaxis for the newborn should be discussed with the CMOH/DCMOH.

Chemoprophylaxis for other contacts may be recommended at the discretion of the CMOH/DCMOH.

Households of a case with a vulnerable contact

- Follow up all contacts in the household
- Refer symptomatic contacts for clinical assessment
- Provide prophylaxis to contacts.
- Ensure household contacts are up to date for pertussis immunization.

Household of a case without a vulnerable contact

- Advise the head of the household of the family's exposure to pertussis and review the Pertussis Outbreak Fact Sheet with them.
- Recommend that anyone with symptoms of Pertussis now or in the future be seen by a health care provider
- Recommend that all household contacts are up to date for pertussis

	immunization. **Vulnerable contacts not associated with one of the above households** • If symptomatic refer for clinical assessment. • Provide prophylaxis • Ensure pertussis immunization is up to date. **Repeat Exposure to a Confirmed or Probable case** If a contact is re-exposed to a case of Pertussis at a later date, contact the RCDC for direction. **Contacts in Schools, and Child Care Settings** If the case attends school or a child care center send a letter and Pertussis Outbreak Fact Sheet to all staff and parents in the school or child care center advising them of the exposure to pertussis and recommending that anyone with symptoms of pertussis now or in the future be seen by a health care provider. If resources permit, ensure that classmates of cases are up to date for pertussis immunization. **Healthcare Workers (includes all administrative and housekeeping staff, visiting medical personnel etc.)** Ensure all Health Care Workers (HCW) are up to date for pertussis immunization. HCWs who meet the exposure criteria should be identified and assessed. • If asymptomatic and pertussis immunization is up to date: no exclusion or prophylaxis is required unless the HCW is considered a vulnerable individual. • If asymptomatic and pertussis immunization is not up to date: immunize and do not exclude from work. Monitor for symptoms. • If symptomatic, test and treat as per the case identification and management section. Exclude confirmed and probable cases until 5 days after antibiotics have been started. Note that use of a mask is not sufficient and exclusion is necessary. • If asymptomatic and refusing immunization, discuss with the Chief Medical Officer of Health who will advise on a case by case basis.
Health Education	• Educate the public about the disease, the associated risks of pertussis infection, especially to infants. • Review fact sheets with patients and parents. • Post fact sheets on the bulletin board of the health center, supermarket, schools, etc. • Public Service Announcements on the radio for community education. • Educate the public about respiratory etiquette i.e., coughing into tissues, hand washing following coughing, etc. • Promote immunization as the cornerstone for the control of pertussis. • See section on Materials and Resources.

Health Settings Management

Infection Control Measures in Health Care Settings	Droplet precautions. Refer to the Infection Prevention and Control Manual particularly: Section 6: Respiratory (Cough and Sneeze) Etiquette Section 7: Droplet Precautions Section 11: Housekeeping and Laundry See also the Housekeeping Procedures Manual. Encourage the patient to cover their cough and dispose of used tissues and frequent hand washing.
Occupational Health	All staff should be UTD with Tdap regardless of outbreak situation. Procedure mask when within 1 meter of patient.

Surveillance

Case Definitions	*To proceed with recommendations under the Public Health Management Section, symptomatic persons must meet one of the case definitions below*
	
	Confirmed case
	A. Laboratory confirmation of infection:
	• detection of *Bordetella pertussis* DNA or an **indeterminate** test result from an appropriate clinical specimen **AND** one or more of the following:
	  • cough lasting 2 weeks or longer
	  • paroxysmal cough of any duration
	  • cough with inspiratory "whoop"
	  • cough ending in vomiting or gagging, or associated with apnea
	  OR
	B. Epidemiologic link to a laboratory-confirmed case **AND** one or more of the following for which there is no other known cause:
	  • paroxysmal cough of any duration
	  • cough with inspiratory "whoop"
	  • cough ending in vomiting or gagging, or associated with apnea
	
	Probable case
	Cough lasting 2 weeks or longer in the absence of appropriate laboratory tests and not epidemiologically linked to a laboratory-confirmed case **AND** one or more of the following, with no other known cause:
	  • paroxysmal cough of any duration
	  • cough with inspiratory "whoop"
	  • cough ending in vomiting or gagging, or associated with apnea
	
	Suspect case
	One or more of the following, with no other known cause:
	  • paroxysmal cough of any duration
	  • cough with inspiratory "whoop"
	  • cough ending in vomiting or gagging, or associated with apnea
	
	Possible Case (For case management only, not for reporting purposes)
	Runny nose AND cough for less than two weeks with or without fever and no

	other known cause**.**
Reporting Requirements and Forms	**Pertussis is a notifiable infection in Nunavut:** 1. Notify the RCDC. 2. Submit an Enhanced Pertussis Case Report form AND Enhanced Pertussis Contact Tracing form on each person meeting the case definition, dated May 2016 or later. 3. Fax or scan the forms within 24 hours of case notification, to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833 4. If you cannot contact your RCDC, contact the Territorial Communicable Disease Coordinator at 867-975-5734.

Tools

Guidelines	Not applicable
Materials & Resources	Pertussis Outbreak Fact Sheet Pertussis CASE Management Algorithm and Worksheet Pertussis CONTACT Management Algorithm Enhanced Pertussis Case Management Form Enhanced Pertussis Contact Investigation Form Bordetella Pertussis Laboratory Testing Procedure
Cross Reference	Nunavut Immunization Manual: Pertussis Immunization sections Nunavut Communicable Disease Manual: Pertussis protocol

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Pertussis-2011.pdf

BC Centre for Disease Control. Communicable Disease Control Management of Specific Diseases. Pertussis. Available online at: http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Epid/CD%20Manual/Chapter%201%20-%20CDC/EPI_Guideline_CDChapt1Pertussis_20100625.pdf

Centers for disease control and prevention. Pertussis. Available online at: http://www.cdc.gov/pertussis/

Heymann D, editor. Control of communicable diseases manual. 19th ed. Washington: American Public Health Association; 2008.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Public Health Agency of Canada, Center for Immunization and Respiratory Infectious Diseases. Pertussis in Canada Epidemiological Summary, 2012. (Internal document).

Approval

Approved by Dr. Michael Patterson, Chief Medical Officer of Health on December 02, 2019.

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé
Nunavut

Pertussis CASE Management Algorithm & Worksheet

Fill out this sheet for anyone you think may have pertussis. For further details see the Pertussis Outbreak Management Protocol.

Case Name: ______________________________

DOB: ______________________________

Case ID: ______________________________

First, Check off all characteristics that apply to the case:

- ❑ A. Lab positive or indeterminate result (PCR)
- ❑ B. Contact with a lab confirmed case
- ❑ C. Cough >2 weeks
- ❑ D. Paroxysmal cough of any duration
- ❑ E. Cough with inspiratory whoop
- ❑ F. Cough ending in vomiting, gagging, or apnea
- ❑ G. Runny nose and mild cough
- ❑ H. No other known cause for the above symptoms

Second, follow the algorithm to decide what case definition fits and determine whether to test, treat, and do contact follow up:

- ❑ **A** *AND* one or more of **C, D, E, F** → **Confirmed case**
- ❑ **B** *AND* one or more of **D, E, F** → **Confirmed case**
- ❑ **C** *AND* one or more of **D, E, F** *AND* **H** → **Probable case**
- ❑ One or more of **D, E, F** *AND* **H** → **Suspect case**
- ❑ **G** with or without **B** → **Possible case**

Confirmed case:

- ❑ **Do not test/retest**
- ❑ **Treat** if symptom onset in last 21 days
- ❑ School/work exclusion (assess case by case with RCDC)

Probable case / Suspect case:

- ❑ **Test**
- ❑ **Treat** if symptom onset in last 21 days
- ❑ School/work exclusion (assess case by case with RCDC)

Then (Confirmed, Probable and Suspect cases):

- ❑ Follow up contacts using *Pertussis Contact Management Worksheet*
- ❑ Ensure immunization is UTD
- ❑ **Send case report form and copy of immunization record to RCDC**

Possible case:

- ❑ **Test.**
- ❑ **Do not treat** unless lab comes back (+) or is prophylaxed as a contact
- ❑ If lab (-), reassess for symptoms (return to First step)
- ❑ Do not report unless (+)
- ❑ Do not follow up contacts unless (+)

If unsure of any steps, contact your RCDC. December 2016 (Reviewed December 2019)

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Ministère de la Santé

Pertussis CONTACT Management Algorithm

Use this sheet for **Confirmed**, **Probable**, and **Suspect** cases of pertussis to determine what management is required for their contacts.

Case Name: ____________________

DOB: ____________________

Case ID: ____________________

First, identify contacts at home, school, daycare etc. who were exposed during the case's infectious period[1]. Contact tracing for prophylaxis is only useful if it has been less than 21 days since first exposure.

Exposure includes:
- Face to face contact for > 5 minutes
- Shared the same confined air space for > 1 hour
- Direct contact with respiratory secretions of the infected person

Vulnerable contacts include:
- Infants <1 year
- Pregnant women ≥ 26 weeks
- Immunocompromised

Household contacts
- Live or sleep in home
- Visit daily, including any children cared for in the home

→ Other than the case, is there a **vulnerable** contact in the home?

- YES → Assess each individual in the household: → Does the contact have **symptoms**?
- NO → **Advise family to:**
  - ❑ Review pertussis outbreak fact sheet
  - ❑ Contact health centre if symptoms arise
  - ❑ Ensure immunizations UTD

Vulnerable contacts (non-household)

→ Assess each vulnerable contact: → Does the contact have **symptoms**?

School or daycare contacts

→ Are there any **vulnerable** contacts?[2]
- YES → Does the contact have **symptoms**?

→ **Classroom or daycare**
- ❑ As resources permit, ensure all UTD
- ❑ Send letter and factsheet home

→ **Rest of school**
- ❑ Send letter and factsheet home

Does the contact have symptoms?

NO:
- ❑ Give prophylaxis (remember, only if exposure was during infectious period[1])
- ❑ Ensure immunizations UTD

YES:
- ❑ If symptoms compatible with pertussis, refer to *Pertussis Case Management Worksheet*
- ❑ Prophylax or treat as appropriate
- ❑ Ensure immunizations UTD

[1] Infectious period is from start of catarrhal stage (cold-like symptoms) until up to 21 days after cough onset, if untreated. Treated cases are non-infectious after 5 days of treatment.

[2] Look for vulnerables in the classroom ONLY for schools. For daycares, look at ALL children attending.

If unsure of any steps, contact your RCDC.

December 2016 (Reviewed December 2019)

Quick Guide to Pertussis Immunization During Increased Pertussis Activity in Nunavut

Refer to the Nunavut Immunization Guide for specific information (e.g. precautions, contraindications etc.) on pertussis containing vaccines.

Key Points

- There is pertussis activity in Nunavut communities at this time.
- During periods of increased pertussis activity, emphasis needs to be put on ensuring all Nunavummiut are appropriately immunized against pertussis with highest priority given to vulnerable individuals.
- Individuals vaccinated previously with acellular pertussis containing vaccine show waning immunity.
- Pertussis containing vaccines are very safe.
- The table below is divided into priorities for all communities given the current outbreaks in some communities.
- In addition, communities with ongoing outbreaks must do additional immunization.

ELIGIBILITY for Pertussis containing vaccine ALL NUNAVUT COMMUNITIES		
Age or category	**Schedule**	**Comment**
Infants 2,4,6, and 18 mos.	As per Nunavut Recommended Schedule.	Put emphasis on ensuring infant immunizations are up to date and on time.
4 to 6 yr olds at school entry	As per Nunavut Recommended Schedule.	Give as soon as eligible.
Grade 6 School based	As per Nunavut Recommended Schedule.	Give as soon as eligible.
Under-immunized children under 18	Refer to Nu. Imm. catch-up aid for children up to 18 years	
Pregnant women in 3rd trimester	Tdap early in the 3rd trimester of each pregnancy (≥ 26 weeks)	This is designed to protect newborns.
All adults > 18	Single dose of pertussis containing vaccine as an adult regardless of last Td.	

Immunization Priority in all Nunavut Communities

Groups at highest priority for immunization

1. Pregnant women early in the 3rd trimester (≥ 26 weeks). Note: Do not repeat in the 3rd trimester if the pregnant women was immunized in the 1st and 2nd trimester.
2. Household contacts of pregnant women in the 3rd trimester (up to date as per regular schedule).
3. All children 18 months and under (up to date and on time with primary series and booster).
4. Immune compromised individuals
5. Health Care Workers
6. All preschoolers
7. Grade 6 students
8. Medical travellers
9. Sports teams especially if going to a community with an outbreak.

Others in the community can be immunized opportunistically when they present to the Health Centre for another reason or as time permits.

Priority in Outbreak Communities

In addition to the priorities for all communities, ensure the following are up to date in outbreak communities.

- Pertussis cases
- All vulnerable contacts.
- All household contacts whether or not there is a vulnerable person in the household .

AND as resources permit:

- School classmates of a case
- Daycare contacts of a case

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Fill in OR affix CASE addressograph here
Last Name: ____________________
First Name: ____________________
Sex: □ Male □ Female □ Other
Date of Birth: ___(DD) ______(month) ____(YYYY)
Chart#: ______________________
Health Card #: ______________________
Community of Residence: ________________

Enhanced Pertussis Case Management Form

BOX 1.1 – DEMOGRAPHIC INFORMATION

Ethnicity (*check <u>one</u>*)	☐ Canadian Inuit ☐ Canadian Non-Aboriginal ☐ Canadian Métis ☐ Foreign-born (*specify country of birth*): _____________ ☐ Other Canadian Aboriginal (*specify*): ______________________________
Travel	Has the patient traveled within or outside territory within the last month prior to diagnosis: ☐ Yes ☐ No ☐ Unknown *If yes*, *specify*:_________________________________
Community	Reporting community: ______________________ If visiting Nunavut, community of residency: ______________________
Case Factors	☐ Healthcare worker ☐ Attends childcare, school, *specify*: ____________________________________

BOX 1.2 – CLINICAL AND LABORATORY INFORMATION

Clinical Course	Onset of symptoms (Catarrhal stage ie. Increased nasal discharge): ______(DD) ______(MM) _______(YYYY)
	Onset of paroxysmal cough: ______(DD) ______(MM) _______(YYYY)
	Symptoms (check all that apply): ☐ Cold-like symptoms (runny nose, sneezing, low-grade fever, or mild cough) ☐ Cough lasting ≥ 2 weeks ☐ Cough ending with inspiratory whoop ☐ Paroxysmal cough ☐ Cough ending in vomiting or gagging, or associated with apnea ☐ Other(s): ________________________________
Treatment	Seen by physician? ☐ Yes ☐ No ☐ Unknown
	Treated with antibiotics? ☐ Yes ☐ No If yes, name of antibiotic and duration: _______________________x _____ days If yes, date started: ____(DD)____(MM)____(YYYY)
Lab Testing	Date pertussis swab done: ____(DD) ____(MM)____(YYYY)
	Result: ☐ Positive ☐ Negative ☐ Pending ☐ Indeterminate
	Other testing:____________________
Epidemiologic Linkage	Is case epidemiologically linked to another case? ☐ Yes ☐ No
	If yes, name of other case (last name, first name): ________________ , ______________ If yes, date of last contact: ____(DD) ____(MM) ____(YYYY)

BOX 1.3 – MEDEVAC HISTORY

Date of medevac	Reason for medevac	Origin	Receiving facility	Date of discharge (if known)

Last Name:	_____
First Name:	_____

BOX 1.4 – IMMUNIZATION HISTORY- *Fill out table OR attach immunization record to this form if available*

Vaccine	Date received (DD/MM/YYYY)	Age	Prov/Terr or Country	Lot number (if known)

BOX 1.5 – Does the case have any high risk CONTACT?

Contacts less than 1yr old?	☐ Yes	☐ No
Contact who is pregnant and in their 3rd trimester?	☐ Yes	☐ No
Contact who lives in a household with high risk individuals (<1yr or 3rd trimester pregnant)?	☐ Yes	☐ No
Contact who has family or daycare interaction with high risk individuals (<1yr or 3rd trimester pregnant)?	☐ Yes	☐ No
Contact who is immune-compromised? (chemotherapy / medication known to inhibit immune system)?	☐ Yes	☐ No

BOX 1.6 – NOTES

Name of person reporting:	Contact information:	Report date:

Fax completed form to the <u>Regional CDC within 24 hours, update as necessary</u>:

- Qikiqtaaluk: (867) 975-4833
- Kitikmeot: (867) 983-4088
- Kivalliq: (867) 645-8272

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- ᖁᐃᖅᓱᑰᔭᓐᓇᖅᑐᖃᓕᖅᑐᑦ ᐱᒋᐊᕈᓐᓇᖅᐳᑦ ᓲᕐᓗ ᓄᕙᑐᐃᓐᓇᕐᓗᑎᒃ ᑕᒋᐅᒃᓴᑲᑕᒡᓗᑎᒃ, ᑲᒃᑭᓕᑲᑕᒡᓗᑎᒃ ᐊᒻᒪ ᖁᐃᓱᓗᐊᑲᑕᙱᓪᓗᑎᒃ, ᐆᓇᓗᐊᑲᑕᙱᓪᓗᑎᒡᓗ. ᐋᓐᓂᐊᕈᑎᖃᓕᕈᓐᓇᖅᐳᑦ ᐅᓪᓗᑦ 7–ᒥᑦ 10–ᒧᑦ ᖃᓂᒻᒪᓕᓚᐅᖅᑎᓪᓗᒍ.
- ᐱᓇᓱᐊᕈᓯᕐᓂ ᒪᕐᕉᖕᓂᒃ, ᖁᐃᖅᓱᕐᔪᐊᑲᑕᒃᐸᓪᓕᐊᓕᕈᓐᓇᖅᐳᖅ ᑕᐅᕗᖓᐅᔭᑲᑕᑕᕐᓗᓂ, ᐊᒃᓯᐊᓗᒃ ᖁᐃᕈᓯᑲᑕᑕᕐᓗᓂ ᒥᓇᐊᑲᑕᑕᕐᓗᓂ, ᑐᖅᓲᕐᒥᑲᑕᒡᓗᓂ, ᐊᓂᖅᓵᕐᑎᐊᕈᓐᓇᐃᓕᕙᓪᓗᓂ, ᐅᕝᕙᓘᓐᓃᑦ 'ᑕᐅᕗᖓᐅᔭᔪᒥᒃ' ᓂᐱᖃᕐᓗᓂ. ᓄᑕᕋᓛᓪᓚ, ᖁᐃᖅᓱᑰᔭᓐᓇᖅᑐᓕᑦ ᐊᓂᖅᓵᕐᑎᐊᕈᓐᓇᐃᑦᑕᕙᑉᐳᑦ.
- ᖁᐃᖅᓱᑰᔭᓐᓇᖅᑐᓕᒃ ᖁᐃᖅᓱᕙᓪᓕᐊᑲᑕᒍᓐᓇᖅᐳᖅ, ᐱᓗᐊᖅᑐᒥ ᐅᓐᓄᐊᒃᑯᑦ, ᐱᓇᓱᐊᕈᓯᓪᓚᖓᓄᑦ ᐅᕝᕙᓘᓐᓃᑦ ᑕᖅᑭᓄᑦ ᑕᐃᒪᐃᑦᑐᓐᓇᖅᓱᓂ.

ᐃᓄᐃᑦ ᑕᒪᕐᒥᑲᓴᒃ ᖁᐃᖅᓱᑰᔭᓐᓇᖅᑐᓕᑦ ᐊᓐᓇᒍᐃᔪᓐᓇᖅᐳᑦ, ᑭᓯᐊᓂᓕ ᐃᓚᖏᑦ ᐃᓄᐃᑦ, ᐱᓗᐊᖅᑐᒥ ᓄᑕᕋᓛᑦ, ᐊᒃᓯᐊᓗᒃ ᖃᓂᒻᒪᒍᓐᓇᖅᐳᑦ. ᐳᕚᒃᑯᑦ ᐃᒻᒪᒃᓯᒪᓕᕈᓐᓇᖅᐳᑦ ᐊᒻᒪ ᖀᒃᓯᓕᕈᓐᓇᖅᓱᑎᒃ

ᑭᓱᒧᑦ ᐃᓅᓕᓴᖅᑕᐅᔪᓐᓇᖅᐸᑦ?

ᖃᐅᔨᓴᐅᓯᓕᒍᑎᒃ ᖁᐃᖅᓱᑰᔭᓐᓇᖅᑐᖃᓕᖅᑐᑦ ᐊᒻᒪ ᒪᒥᓴᐅᒻᒧᑦ ᐃᓅᓕᓴᖅᑕᐅᓯᓇᐊᖃᑦᑕᕆᓗᑎᒃ. ᐊᒃᑐᖅᑕᐅᓴᕋᐃᑦᑐᑦ ᖃᓂᒻᒪᕐᔪᐊᓗᐃᓐᓇᓕᐊᓕ ᐃᓅᓕᓴᖅᑕᐅᔭᓇᐃᑦ ᖃᓂᒻᒪᖁᓇᒋᑦ. ᐅᑯᐊᖑᓪᓗᑎᒃ: ᓄᑕᕋᓛᑦ ᓯᓚ ᐅᑭᐅᖃᙱᑦᑐᑦ, ᓯᖓᐃᔪᑦ ᑕᖅᑭᓂᒃ ᐱᖓᓱᓂᒃ ᐃᕐᓂᕙᒃᓴᑲᓕᑦ (ᓯᖓᐃᖓ ᓴᐳᑎᔭᐅᖁᒡᓗᒍ), ᑭᓇᑐᐃᓐᓇᖅ ᓴᙲᓗᐊᖅᑐᒥᒃ ᐋᓐᓇᐅᒪᔾᔭᑎᖃᖅᑐᖅ, ᐊᒻᒪᓗ ᐃᒡᓗᒥᐅᖃᑎᖏᑦ. ᐃᓗᐊᖅᓴᐃᔨᑦ ᖃᐅᔨᑎᑦᓂᐊᖅᐸᑎᑦ ᓇᓕᐊᒃ ᐃᓅᓕᓴᖅᑕᐅᓯᒪᓂᖏᓐᓂᒃ.

ᓄᑕᖅᑲᑦ ᐊᒻᒪ ᐃᓐᓇᐃᑦ ᖁᐃᖅᓱᑰᔭᓐᓇᖅᑐᒧᑦ ᑲᐱᔭᐅᔾᔪᑎᒋᔭᖅᑕᖅᑐᒥᒃ ᑲᐱᔭᐅᕚᓂᒃᓯᒪᓪᓚᕆᖕᒋᑦᑐᑦ ᑲᐱᔭᐅᑲᐅᑎᒋᔭᖅᑕᖅᐳᑦ.

ᖃᓄᒃᑲᓐᓂᖅ ᖁᐃᖅᓱᑰᔭᓐᓇᖅᑐᖅᑖᖅᑕᐃᓕᑎᑦᑎᔪᓐᓇᖅᐱᑕ?

- ᖁᐃᖅᓱᑰᔭᓐᓇᖅᑐᒧᑦ ᑲᐱᔭᐅᓗᓂ ᐱᐅᓂᖅᐹᖑᔪᖅ. ᖃᐅᔨᒋᐊᖅᑲᑦᑕᓇᑦ ᖁᐃᖅᓱᑰᔭᓐᓇᖅᑐᒧᑦ ᑲᐱᔭᐅᔾᔪᑎᒋᔭᕆᐊᖃᖅᑕᓐᓂᒃ ᑲᐱᔭᐅᕚᓂᒃᓯᒪᒐᓗᐊᕐᒪᖔᖅᐱᑦ ᐊᒻᒪ ᖃᑕᙳᑎᑎᑦ.
- ᑕᓕᕐᓄᑦ ᑲᒃᑭᐅᑎᒃᓴᒧᑦ ᒪᑐᐊᕐᐸᓪᓗᑎᑦ ᖁᐃᖅᓯᓕᕌᖓᕕᑦ. ᐊᒡᒐᑎᑦ ᐃᕐᒥᒃᐸᓪᓗᒋᑦ, ᐱᓗᐊᖅᑐᒥ ᖁᐃᖅᓯᐊᓂᒃᑳᖓᕕᑦ ᑕᒋᐅᒃᓴᓂᒃᑳᖓᕕᑦ, ᐊᒻᒪ ᖃᓂᒪᔪᒥᑦ ᑲᒪᓂᐊᕐᓂᖓᕕᑦ ᑲᒫᓂᒃᑳᖓᕕᑦ, ᖁᐱᕐᕈᐊᕐᔪᖕᓂᒃ ᐊᐃᑦᑐᕐᑐᐃᑦᑕᐃᓕᒪᔾᔭᑕᐅᕙᑦ.
- ᐊᒥᖅᑳᖅᑲᑦᑕᙱᓪᓗᓯ ᓂᕿᓂᒃ, ᓂᐅᖅᑲᒐᕐᓂᒃ, ᓯᐅᓪᓚᐊᓂᒃ ᐅᕝᕙᓘᓐᓃᑦ ᓂᓇᔾᔭᑎᓂᒃ, ᐊᒻᒪ ᑭᒍᑎᓯᐅᑎᓂᒃ.
- ᐋᓐᓂᐊᕈᑎᖃᓕᕈᕕᑦ ᐅᕝᕙᓘᓐᓃᑦ ᕿᑐᕐᖓᓚᐃᑦ ᐋᓐᓂᐊᕈᑎᖃᓕᖅᐸᑦ ᖁᐃᖅᓱᑰᔭᓐᓇᖅᑐᒧᑦ ᐃᓗᐊᖅᓴᐃᔨᒧᑦ ᑐᓴᖅᑎᑦᑎᓗᑎᑦ.

Fact Sheet

Pertussis Outbreak

What is pertussis disease?
Pertussis or 'whooping cough' is a serious infection of the lungs and throat caused by pertussis bacteria (germs).

How is it spread?
Pertussis spreads easily when an infected person coughs, sneezes or has close contact with others. Sharing food, cigarettes, or kissing someone with pertussis can put you at risk. Pertussis can spread to others during the early stages of the infection when symptoms are not severe until 3 weeks after the cough starts. Sick persons cannot spread pertussis once they have had 5 days of antibiotics.

Who is at risk?
- Anyone can get pertussis.
- Infants less than 1 year are most at risk for severe illness.
- Pregnant woman who get sick with pertussis in their last 3 months of pregnancy could spread the infection to their newborn.
- Persons with weakened immune systems.

What are the symptoms of pertussis?
- Pertussis starts like a common cold with symptoms such as sneezing, runny nose and mild cough, and mild fever. Symptoms usually start 7-10 days after becoming infected.
- Over the next 2 weeks, the cough can worsen into repeated, forceful coughs that may end in vomiting, gagging, difficulty breathing, or a funny 'whoop' sound. In babies, pertussis can cause trouble breathing.
- A pertussis cough may be severe, worse at night, and can last for weeks or months.

Most people will recover from pertussis, but some people, especially infants, can become very ill. Pneumonia and seizures can occur.

What is the treatment?
Early diagnosis of pertussis and treatment with an antibiotic are important. Vulnerable close contacts at high risk of serious illness may also receive an antibiotic to prevent the disease. This includes: infants less than 1 year of age, pregnant women in the last 3 months of their pregnancy (to protect the newborn), people with weakened immune systems, as well as their household contacts. Your health care provider will help determine which cases and contacts should receive antibiotics.

Children and adults who have not completed their recommended pertussis immunizations will need the vaccine as soon as possible.

How else can pertussis be prevented?
- Pertussis vaccine is the best prevention. Ensure pertussis vaccines for you and your family are up to date.
- Cough into your sleeve or tissue. Hand washing, especially after coughing and sneezing, and before and after caring for a sick person, will help prevent the spread of germs.
- Avoid sharing food, drinks, cigarettes or eating utensils, and toothbrushes.
- If you or your child develop symptoms of pertussis report to your health care provider.

Ilihimayaghat titiqqat

Pertussismik Aaniagut Aanialaqutauyuq

Hunauva pertussis aaniagut?

Pertussis uvaluuniin "or ‘qalakyuaqniq" qayangnaqtuq aaniagut puvangnun igiamunlu pidjutigiyaa pertussis aanialaqhutaa (halumailgua).

Qanuq hiamitiqpakpa?

Pertussis hiamitiinaqtuq una aaniagutilik qalakumi, tagyughumi uvaluuniin qanitunut inungnun. Nigiblutik atauhiqmik niqimik, higaanik, uvaluuniin quniktuinikkut pertussismik aaniagutqaqtumik qayangnaqniaqtuq ilingnun Pertussis hiamitaaqtuq aanialihaaqtumit aanigutmik naunaitkutait naunailimaitut tikitinagu pingahunik havainiqni qalaqhuqniq aulagutikpat. Aaniaqtut inuit hiamitilimaitut pertussismik talimanik ublunik havautitugumik.

Kimut qayaguutauyuq?

- Inuk kituliqaak aannialaqittaaqtuq pertussismik.
- Nutaganuit ukiuqangitut atauhiqmik qayagiluaqtauyut aanialaqiqyuaqniaqtut.
- Hingaiyat angnat aaniagumik aaniagutmik pertussismik kinguliqni pingahut tatqiqhiutit himaitaaqtuq aaniagutaa hingaiyaminun.
- Inuit hakukluktut timimingni auladjutaini.

Hunauvat naunaitkutait hafuuminga pertussismik?

- Pertussis aulagutaa imaatun ituq qalalaqiyutut naunaitkutait imaatut tagyuqhutik, kingait kugluaqhutik uvalu qalakhutik, uvalu kidjakhutik. Naunaitkutait aulagutiyut saivat-qulit ubluit aaniagutinikumik.
- Malgukni havainiqni, qalakhuqniq ingataqyuumiluni aulahimaaqtumik, akhut qalakhuqluni migiaqlunilu, tuffuluni, aanighaaqtagiamini ayuqhaliqluni, ihuitumik 'nivyaqlutumik' nipaa Nutaganuani, pertussis anighaagiamingni ayuqhaqniaqtut.
- Una pertussis qalaa ingataqluni, ingataqluni unuami, uvalu qalakluni ikituni havaniqni uvaluuniin tatqiqhiutini .

Ilait inuit aaniaguiqniaqtut aanigutaanik pertussis, kihimi ilait inuit, hapkualuat nutaganuat, aanialaqiqpiaqlutik. Pneumoniaqlutik uvalu qiiqilutik.

Hunauva munagidjutighaa?

Qilamik naunaiyaqniit pertussismik uvalu mamitiutighaanik havautinik akhuuqnaqtut. Qayangnaqtut haniini pihimayut qayangnatqiat akhut aaniaqtut havautituqlutik pittailiyaangani aaniagut. Una ilauyuq: nutaganuat ukiuqangitut atauhiqmik, hingaiyat angnat kinguliqni pingahuni tatqiqhiutini (pittaililugu hingaiyatik), inuit hakukluktut timimingni auladjutimingni, hapkualu iglumiuqatitik aktuqnikkut. Munaqhitkuni munaqhiit ikayuqniaqtaahi naunaiyaqlugu kitut aaniaqtut uvalu aktuqnikkut havautituqtughat.

Nutaqat uvalu ingningnigit iniqhimangitait pitquyauhimayut pertuussismik kapuqhiqniq kapuqtauyagiaqaqtut qilamik.

Ilihimayaghat titiqqat

Pertussismik Aaniagut Aanialaqutauyuq

Qanuqlu pertussis pittailiniaqa?

- Pertussiskut kapuqhiqniq nakuutqiaq pittailiniq. Pipkaqlugit pertussiskut kapuutinik ilvit uvalu ilatillu nutaanguqhimalugit.
- Qallaghuqlutit aiqnun uvaluuniin kakiiyautmun Algaknik uaqataaqniq, qalakhuguvin uvalu tagyuguvin, uvalu munaqhihuiguvin aaniaqtumik, pittailidjutauniaqtut himaitiknia halumailgup.
- Attauhiqik niqimik nigihuiqluhi, imaknik, higaaqnik uvaluuniin nigidjutinik, uvalu kigutigihautinik.
- Ilvit nutaqatluuniin naunaiqat naunaitkutainik pertussis uniutilugit munaqhitkut.

Fiche d'information

Éclosion de coqueluche

La coqueluche, c'est quoi?

La coqueluche est une grave infection des poumons et de la gorge, causée par la bactérie *Bordetella pertussis* (un germe).

Comment se transmet-elle?

Les personnes infectées peuvent facilement transmettre la coqueluche par la toux, les éternuements et des contacts rapprochés avec leur entourage. Il est risqué de partager de la nourriture avec une personne atteinte, de fumer avec elle la même cigarette ou de l'embrasser. La maladie est transmissible dès les premiers stades alors que les symptômes sont encore légers, et jusqu'à trois semaines après l'apparition de la toux. Après un traitement antibiotique de cinq jours, les personnes malades ne sont plus contagieuses.

Qui est à risque?

- Personne n'est à l'abri.
- Les nourrissons de moins d'un an sont les plus à risque de contracter une forme grave de la maladie.
- Les femmes enceintes qui contractent la coqueluche à leur dernier trimestre de grossesse peuvent infecter leur bébé.
- Les personnes au système immunitaire affaibli.

Quels sont les symptômes?

- La coqueluche commence comme un rhume ordinaire et est caractérisée par des éternuements, un écoulement nasal, une faible toux et une légère fièvre. En général, les symptômes se manifestent de sept à dix jours après l'infection.
- Dans les deux semaines suivantes, le rhume peut dégénérer en quintes de toux répétées et violentes qui s'accompagnent parfois de vomissements, de haut-le-cœur, d'une difficulté à respirer (entre autres chez les bébés) ou d'un son étrange.
- Parfois violente, la toux peut s'aggraver la nuit et durer des semaines ou des mois.

Les personnes infectées recouvreront la santé pour la plupart, mais d'autres, surtout les nourrissons, peuvent devenir très malades. Il y a des risques de pneumonie et de convulsions.

Quel est le traitement?

Un diagnostic précoce et un traitement antibiotique rapide sont importants. Les personnes vulnérables ayant des contacts étroits avec une personne infectée peuvent aussi recevoir un traitement par prévention. Il s'agit des personnes courant de grands risques de souffrir d'une forme grave de la maladie, comme les nourrissons de moins d'un an, les femmes enceintes qui en sont à leur dernier trimestre (pour protéger le bébé), les personnes ayant un système immunitaire affaibli et celles qui vivent sous le même toit que la personne malade. Votre fournisseur de soins de santé vous aidera à déterminer qui doit prendre des antibiotiques.

Les enfants et les adultes n'ayant pas été vaccinés contre la coqueluche selon les recommandations devront le faire dès que possible.

Fiche d'information

Éclosion de coqueluche

Quels sont les autres moyens de prévention?

- Le vaccin contre la coqueluche est le meilleur moyen de prévention. Assurez-vous que vos vaccins et ceux des membres de votre famille sont à jour.
- Toussez dans votre manche ou dans un mouchoir. Se laver les mains, surtout après avoir toussé et éternué ainsi qu'avant et après avoir pris soin d'une personne malade, contribue à prévenir la transmission des germes.
- Évitez de partager de la nourriture et des boissons ainsi que de mettre votre bouche en contact avec une cigarette, un ustensile ou une brosse à dents utilisés par une autre personne.
- Si vous ou votre enfant manifestez des symptômes de la coqueluche, signalez-le à votre fournisseur de soins de santé.

ᐋᓐᓂᐊᖃᕐᓇᙱᑦᑐᓕᕆᔨᒃᑯᑦ
Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

CASE ID:
(RCDC use)

Fill in OR affix CASE addressograph here
Last Name: ____________________
First Name: ____________________
Sex: ☐ Male ☐ Female ☐ Other
Date of Birth: ___(DD) ______(month) ____(YYYY)
Chart#: ______________________
Health Card #: ______________________
Community of Residence: ________________

Enhanced Pertussis Case Management Form

For regional/territorial use: CASE STATUS

☐ Confirmed case (lab positive + symptoms)
☐ Confirmed case (lab indeterminate + symptoms)
☐ Confirmed case (epi-linked + symptoms)
☐ Not a case (lab negative)
☐ Not a case (doesn't fit case definition)
☐ Probable case
☐ Suspect case

See case definitions for more detail

BOX 1.1 – DEMOGRAPHIC INFORMATION

Ethnicity	☐ Canadian Inuit ☐ Canadian Non-Aboriginal ☐ Canadian Métis ☐ Foreign-born ☐ Other Canadian Aboriginal
Travel	Has the patient traveled within or outside territory within the last month prior to diagnosis: ☐ Yes ☐ No ☐ Unknown If yes, specify location:______________________________Dates:________________________
Community	Community of residence: ______________________________ Community/communities of possible pertussis exposure: __________________________________
Case factors	☐ Healthcare worker ☐ Attends daycare ☐ Attends school Daycare/School name: ___________________________________ Grade: __________

BOX 1.2 – CLINICAL AND LABORATORY INFORMATION

	Symptoms	Presence	When did symptoms start?
Signs and symptoms	• Runny nose	☐Yes ☐ No ☐Unknown	_____(DD) _____(MM)_____(YYYY)
	• Fever	☐Yes ☐ No ☐Unknown	
	➢ Does the person have ANY cough?	☐Yes ☐ No ☐Unknown	<u>When did cough start?</u>
	• Does cough have inspiratory "WHOOP" at the end?	☐Yes ☐ No ☐Unknown	
	• Are there paroxysms, i.e. spasms of uncontrolled coughing?	☐Yes ☐ No ☐Unknown	_____(DD) _____(MM)_____(YYYY)
	• Does the cough end with gagging or vomiting or apnea?	☐Yes ☐ No ☐Unknown	
	Other symptoms (describe):		
Treatment	Treated with antibiotics? ☐ Yes ☐ No If yes, name of antibiotic and duration: ____________________x ____ days Date started: _____(DD) _____(MM)_____(YYYY)		
Lab testing	Date pertussis swab done: _____(DD) _____(MM)_____(YYYY)	Lab result: ☐ PCR Positive ☐ PCR Indeterminate ☐ PCR Negative ☐ Other:	
	Viral respiratory panel swab done: _____(DD) _____(MM)_____(YYYY) Result:		

Close contact with pertussis case(s)

☐ Yes
☐ No
☐Unknown

If yes, list name(s) and relationship(s):

Name	Relationship	Case ID (for RCDC use)

Case Name: _____
DOB: _____
Case ID: _____

BOX 1.3 – MEDEVAC AND HOSPITALIZATION HISTORY

Type	Date	Reason	Origin	Receiving facility	Date of discharge
☐ Hospitalization ☐ Medevac					
☐ Hospitalization ☐ Medevac					
☐ Hospitalization ☐ Medevac					

BOX 1.4 – IMMUNIZATION HISTORY

1. Please attach copy of immunization record to this form.

For RCDC: Was individual up to date for age with pertussis vaccinations at time of exposure to pertussis? ☐ Yes ☐ No

2. For children less than 1 year of age, please attach mother's immunization record OR indicate:

Was mother immunized for pertussis during the third trimester?

☐ Yes ☐ No ☐Unknown

If yes, date of immunization: _____(DD) _____(MM)_____(YYYY)

BOX 1.5 – CONTACTS: Does the case have any contacts who are vulnerable individuals?

Contacts less than 1yr old?	☐ Yes	☐ No
Contact who is pregnant and in their 3rd trimester?	☐ Yes	☐ No
Contact who is immune-compromised? (on chemotherapy or a medication known to inhibit immune system)?	☐ Yes	☐ No

BOX 1.6 – NOTES

Name of person reporting:	Tel:	Report date:

Fax completed form to the Regional CDC within 24 hours, update as necessary:

- Qikiqtaaluk: (867) 975-4833
- Kitikmeot: (867) 983-4088
- Kivalliq: (867) 645-8272

Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble

Case name: _____DOB:_____ Case ID: _____

Enhanced Pertussis Contact Tracing Form

Complete only for **household** contacts (including daily visitors) and other contacts who are **vulnerable individuals**

	Name	DOB (DD/MM/YY)	Sex	Relationship	Household contact?	Vulnerable?	Signs & Syx	Swab done?	Proph recommended?	Abx started?	Imm'n status at time of exposure	Pertussis imm'n type & date(s)
#1					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No Date:	☐ Yes ☐ No	☐ Yes ☐ No Date:	☐ None ☐ Incomplete ☐ UTD	
#2					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No Date:	☐ Yes ☐ No	☐ Yes ☐ No	☐ None ☐ Incomplete ☐ UTD	
#3					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No Date:	☐ Yes ☐ No	☐ Yes ☐ No	☐ None ☐ Incomplete ☐ UTD	
#4					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No Date:	☐ Yes ☐ No	☐ Yes ☐ No	☐ None ☐ Incomplete ☐ UTD	
#5					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No Date:	☐ Yes ☐ No	☐ Yes ☐ No	☐ None ☐ Incomplete ☐ UTD	
#6					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No Date:	☐ Yes ☐ No	☐ Yes ☐ No	☐ None ☐ Incomplete ☐ UTD	
#7					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No Date:	☐ Yes ☐ No	☐ Yes ☐ No	☐ None ☐ Incomplete ☐ UTD	
#8					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No Date:	☐ Yes ☐ No	☐ Yes ☐ No	☐ None ☐ Incomplete ☐ UTD	

Exposure includes:

- Face to face contact for > 5 minutes
- Shared the same confined air space for > 1 hour
- Direct contact with respiratory secretions of the infected person

Vulnerable individuals:

- Infants < 1year of age
- Pregnant women in the 3rd trimester
- Immunocompromised individuals

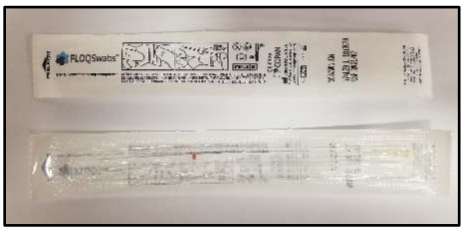
Household contacts:

- All individuals who live in the home including attendees at family daycare
- Individuals who visit the household daily.

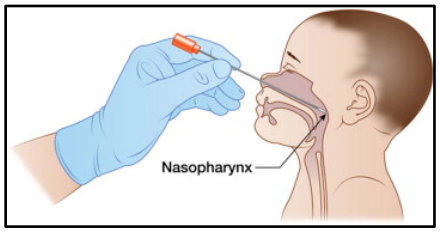
Laboratory Testing for Bordetella Pertussis

If any patient presents with symptoms suspicious of pertussis - swab prior to treatment.

Step 1 – Use the Nasopharyngeal swab provided in the *Bordetella Pertussis Testing Kit*
This kit is not the same as the one used for a viral respiratory panel. Both tests are indicated for a client presenting with symptoms of pertussis. Please see the *Nunavut Pertussis Outbreak Protocol* for further details.



Step 2 – Take swab.
Do not collect an NP swab in the same room where pertussis containing vaccine is being given as it may render a false positive result.



Step 3 - Insert the swab into the pertussis media for PCR testing.

Step 4 – Fill out the requisition
Include client name, date of birth, provider name and community name - Indicate on the requisition that testing is for Bordetella Pertussis.

Step 5 – Report
Pertussis is a reportable infection in Nunavut. Notify the regional Communicable Disease Coordinator or Chief Medical Officer of Health on call with any suspect, probable, or confirmed cases within 24 hours. CMOH on call: 867-975-5772.

Regional Communicable Disease Coordinator (RCDC) contact information		
Kitikmeot Region:	**Kivalliq Region:**	**Qikiqtaaluk Region:**
Phone: 867-983-4508 Fax: 867-983-4088	Phone: 867-645-2171 ext. 1503 Fax: 867-645-2409	Phone: 867-975-4811 Fax: 867-975-4833

Please refer to the **Nunavut *Pertussis Outbreak Protocol*** or contact your Regional Communicable Disease Coordinator for further information on pertussis testing.

The Nunavut Communicable Disease and Immunization Manuals are available here:
www.gov.nu.ca/health/information/manuals-guidelines

7.7.1 Poliomyelitis

Special Precautions/Considerations

Precautions: Routine (Contact if children <6 years)

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Poliovirus, of the genus Enterovirus. There are three types: Types 1, 2 and 3; all types can cause paralysis, though Type 1 is most often associated with Poliomyelitis.
Clinical	
Clinical Presentation	Poliomyelitis (Polio) is an acute viral illness, ranging from sub-clinical infection to paralytic disease. Over 90% of cases are asymptomatic or may have only fever. Symptoms of minor illness include fever, headache, malaise, nausea and vomiting. If disease progresses to major illness, there may be severe muscle pain and stiffness of the neck and back with flaccid paralysis. The most characteristic feature of polio paralysis is asymmetric distribution, which affects some muscle groups while sparing others.
Diagnostics	The following are considerations to confirm Polio: • All suspected cases of Polio should have a throat swab and CSF submitted for viral isolation. • Collection of one stool sample within two weeks (up to 6 weeks) after the onset of paralysis for viral studies. A rectal swab is acceptable in the absence of a stool sample. • Serum specimen should be collected immediately for polio serology. • In the absence of a positive culture, acute and convalescent neutralizing antibody titres can be examined to detect a fourfold rise indicative of infection. In some cases these antibodies may already be present at the time of paralysis and no rise is demonstrated. • A second serum specimen should be collected two weeks later if the patient presents in the acute phase of the illness or one month later if the patient presents in the convalescent phase. Samples should be tested in parallel for poliovirus antibody titres and polio-specific IgG and IgM evaluations. • All samples may be forwarded to the National Centre for Enteroviruses for further investigation when needed, i.e., to determine whether the virus is wild-type or vaccine strain. • Neurologic investigations should take place (electromyography, nerve conduction studies, MRI, CT). Follow your regional laboratory procedures for testing.
Treatment	Supportive treatment as indicated. Attention to respiratory needs of those with severe illness.
Pathogen	
Occurrence	**Worldwide**: Polio cases have decreased by over 99% since 1988; the reduction is the result of a global effort to eradicate the disease. In 2012, only three countries (Afghanistan, Nigeria and Pakistan) remain polio-endemic, down from more than 125 countries in 1988. **Canada**: Canada was certified polio-free in 1994. One of the conditions of the certification was to establish a surveillance system for the identification of Acute Flaccid Paralysis (AFP). Active surveillance for AFP continues. This data

	is collected by the Canadian Paediatric Surveillance Program and IMPACT. **Nunavut**: There have been no reported cases of Polio in Nunavut.
Reservoir	Humans
Transmission	Wild-type Polio is predominately transmitted through the fecal-oral or respiratory route. In cases of vaccine-associated paralytic poliomyelitis (VAPP) the transmission via OPV is most often associated with the first dose. Transmission to recipients or their contacts is rare.
Incubation Period	The incubation period is 9-12 days with a range of 5-35 days to onset of the prodromal period and 11-17 days with a range of 8-36 days to onset of paralysis. In cases of vaccine-associated disease, paralysis may occur 7-21 days following the administration of OPV while contact cases (those in contact with another person who has received OPV) appear within 20-29 days.
Communicability	Not precisely defined, however it is communicable for as long as the virus is shed in the throat (36 hours to 12 days after exposure) or in the stool (72 hours to six weeks after exposure or until feces are culture negative). The disease is most communicable in the few days before and after the onset of symptoms.
Susceptibility and Resistance	Immunodeficiency increases the risk for acquiring Polio. Viral type specific immunity follows an infection.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the *Vaccine Preventable Disease Report Form* dated March 2014 or later (section 7.7.2). • Household measures are felt to be of little use since the infection has usually spread by the time the first case is suspected. It is still important, however, to implement routine practices and contact precautions. • Throat discharges, feces, and contaminated articles should be handled using routine practices and contact precautions. In areas where there is modern sewage disposal, feces and urine can be discharged directly into the sewers.
Contacts	1. Identify symptomatic contacts and refer to a health care provider for assessment. 2. Contacts may be quarantined by order of the Chief Medical Officer of Health (CMOH)/Deputy CMOH. This is generally not valuable in most cases, as often the virus has already been transmitted when the case is identified. 3. Interview contacts to assess polio immunization history and have immunization updated, if needed, according to the Nunavut Immunization Manual. With regard to Polio, contacts are defined as: • Persons living in the same household or having close contact with the case (e.g. sharing sleeping arrangements or playing together for greater than or

	equal to 4 hours) within 30 days before the case's onset of illness; • Children attending the same daycare as the case; • Persons having contact with stool or fecal matter of the case within 30 days before the case's onset, without using infection control precautions. • Complete the *Vaccine Preventable Diseases Contact Investigation Form* dated March 2014 or later (section 7.7.3). Include additional pages for contact information as necessary.
Outbreaks	If a single case of Polio is suspected, contact your Regional Communicable Disease Coordinator (RCDC).
Health Education	• Immunize children according to the Nunavut Immunization Schedule. • Healthcare workers should demonstrate proof of immunity when hired (proof of immunity may include history of disease, serological evidence of disease or documented age-appropriate doses of polio vaccine). • Immunize non-immune persons according to the Nunavut Immunization Schedule. • Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing and before preparing foods and eating. • Educate the public about the risks associated with sharing saliva-contaminated items (e.g. cigarettes, food, drinks, lipstick, etc.) • Persons traveling to countries where Polio continues to circulate should ensure they are immune.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine precautions. Direct and indirect contact precautions for children less than 6 years of age. Communicable for duration of shedding which could be up to 6 weeks.
Occupational Health	Healthcare workers must have current immunization. Gown and gloves when in direct or indirect contact with feces and/or respiratory secretions.
Surveillance	
Case Definition	**Confirmed case:** Clinical illness* with laboratory confirmation of infection: • Isolation of polio virus (vaccine or wild type) from an appropriate clinical specimen **OR** • Detection of polio virus RNA **OR** • Clinical illness in a person who is epidemiologically linked to a laboratory-confirmed case. **Confirmed case categories:** Paralytic polio can be subdivided into the following two categories: 1. Wild-virus: Laboratory investigation implicates wild type virus. This group is further subdivided as follows: • Imported: travel or residence in a polio-endemic area 30 days or less before onset of symptoms. • Import-related: epidemiologically linked to someone who has traveled or resided in a polio-endemic area within 30 days of onset of symptoms. • Indigenous: no travel or contact as described above. 2. Vaccine-associated:

	Laboratory investigation implicates vaccine-type virus. This group is further subdivided as follows: • Recipient: the illness began 7-30 days after the patient received oral polio vaccine (OPV). • Contact: the patient was shown to have been in contact with an OPV-recipient and became ill 7-60 days after the contact was vaccinated. • Possible contact: the patient had no known direct contact with an OPV-recipient and no history of receiving OPV, but the paralysis occurred in an area in which a mass vaccination campaign had been in progress 7-60 days before the onset of paralysis. • No known contact: the patient had no known contact with an OPV-recipient and no history of receiving OPV, and the paralysis occurred in an area where no routine or intensive OPV vaccination had been in progress. In Canada, this would include all provinces and territories. **Probable Case:** Clinical illness[1] without detection of polio virus from an appropriate clinical specimen and without evidence of infection with other neurotropic viruses but with one of the following laboratory confirmations of infection: • Significant rise in polio virus antibody titre in paired sera **OR** • Positive serologic test for polio IgM antibody in the absence of recent immunization with polio virus-containing vaccine. **Suspect Case:** Clinical illness[1] and no laboratory confirmation of infection (no polio virus detection or serologic evidence), including negative test results, and inadequate or no investigation. ***Clinical illness is characterized by all of the following:** • Acute flaccid paralysis of one or more limbs, • Decreased or absent deep tendon reflexes in the affected limbs, • No sensory or cognitive loss, • No other apparent cause (including laboratory investigation to rule out other causes of a similar syndrome) and • Neurological deficit present 60 days after onset of initial symptoms unless the patient has died.
Reporting Requirements and Forms	**Polio is a notifiable infection in Nunavut:** 1. Notify your RCDC. 2. Complete the *Vaccine Preventable Disease Report Form* dated March 2014 or later (section 7.7.2) and the *Vaccine Preventable Diseases Contact Investigation Form* dated March 2014 or later (section 7.7.3). 3. Fax the form, within 24 hours of case notification to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833 4. If you cannot contact your RCDC, contact the Territorial Communicable Disease Consultant at 867-975-5734.
Tools	
Guidelines	Not applicable
Materials & Resources	Not applicable

Cross Reference	Nunavut Immunization Manual: Polio Immunization sections

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Poliomyelitis-2011.pdf

Canadian Immunization Guide, Evergreen Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/

Public Health Agency of Canada, 2006. Canadian Immunization Guide, Seventh Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 2, 2014.

7.8.1 Rubella

Special Precautions/Considerations

Precautions: Droplet and Contact

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Rubella virus.
Clinical	
Clinical Presentation	Rubella is most often a mild viral illness associated with rash in approximately half of infections. Asymptomatic infections occur. Generally, a prodrome occurs 1-5 days before the onset of rash which may be characterized by low-grade fever, headache, mild coryza, malaise and conjunctivitis. Children usually have few or no symptoms. Lymphadenopathy, involving occipital, post auricular and posterior cervical nodes, may start 5-10 days prior to the rash onset and is the most characteristic sign. Transient arthralgia and, less frequently, arthritis may occur in up to one-third of women and usually begins at the same time as the rash or shortly afterwards. The rash is diffuse, punctate (red pinpoint), and maculopapular. It is often itchy and begins on the face. The usual duration is 3-5 days. Clinically, Rubella is indistinguishable from febrile rash illnesses caused by measles, parvovirus B19, human herpes virus 6 (HHV6), Coxsackie virus, ECHO virus, adenovirus and dengue virus, and laboratory confirmation is required for diagnosis unless there is an epidemiological link to a confirmed case. Rare complications include chronic arthritis and encephalitis in adults, and thrombocytopenia in children. Rubella is important because of its ability to produce anomalies in the developing fetus if the infection is acquired in the first trimester of pregnancy (refer to Section 7.9.1 Congenital Rubella protocol).
Diagnostics	The clinical diagnosis of Rubella is often difficult as Rubella has many symptoms in common with other rash illnesses. IgM antibodies develop about 5 days post rash onset. IgM antibodies can persist for 6 weeks after the rash onset. If the IgM is negative and the sample has been taken on or before the fifth day post rash onset, another specimen should be taken as soon as possible (more than 5 days post rash onset). Seroconversion or a significant rise in rubella IgG between acute and convalescent sera collected at least 10 days apart will assist with the diagnosis of infection. Isolation of rubella virus from the nose, throat, cerebral spinal fluid, urine or blood can be used to confirm the diagnosis. Ideal specimens are respiratory (nasopharyngeal or throat swabs). Specimens should be obtained as soon as possible after onset (less than 4-5 days post onset). Follow your regional laboratory procedures for testing.
Treatment	Supportive treatment as indicated. No specific treatment is available for Rubella.
Pathogen	

Occurrence	**Worldwide:** Worldwide occurrence. Rubella occurs primarily in unimmunized groups. In many countries, sustained high levels of rubella immunization have drastically reduced or essentially eliminated Rubella and Congenital Rubella Syndrome. **Canada:** The first laboratory-confirmed cases of Rubella in Canada were reported in 1924. Vaccine was introduced in 1969. Currently, approximately 2,000 cases are reported annually. Overall, 50–60% of reported cases occur among adolescents and young adults between the ages of 10 and 39 years. **Nunavut:** There have been no reported cases since 2000.
Reservoir	Humans
Transmission	Infection is transmitted by droplet spread and/or direct contact with nasopharyngeal secretions of infected individuals. Although rubella transmission is most often associated with repeated and prolonged exposure, transmission has been documented following a single exposure.
Incubation Period	Average length is 14-17 days, however can be as long as 21 days.
Communicability	From 7 days before the onset of the rash until at least 4 days after rash onset. Rubella is a highly communicable disease and is most contagious when the rash is erupting.
Susceptibility and Resistance	Universal susceptibility following the loss of acquired maternal antibodies (usually 6-9 months). In closed environments all exposed susceptible individuals may become infected. Immunity is believed to be permanent after natural infection, and thought to be long-term, probably lifelong, after immunization. However, re-infection following successful immunization or natural disease has been reported, especially in outbreak situations. The vast majority of these re-infections is asymptomatic and rarely lead to Congenital Rubella. Most individuals born in Canada before 1970 can be considered immune as they have likely been infected naturally.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case or guardian. Case management is critical to prevent Congenital Rubella Syndrome and Congenital Rubella Infection. Complete the *Vaccine Preventable Disease Report Form* dated March 2014 or later (section 7.8.2). Infected individuals should be excluded from school, childcare or work until 7 days after the appearance of the rash. Isolation of the infected individual is important so as not to infect those who may be susceptible. Infected individuals should be advised to avoid contact with pregnant females and should be questioned regarding known contact with pregnant females (see Contacts section).
Contacts	A contact of a Rubella case is any susceptible person who has had close contact with the case during the period of communicability. **Susceptible contacts**: The following individuals are considered susceptible:

	• Individuals born in or after 1970. • Individuals without documented evidence of two doses of rubella-containing vaccine (the first dose given on or after the first birthday and an interval of at least one month between the two doses). • Individuals without a history of physician-documented Rubella infection. • Individuals without laboratory evidence of rubella immunity. **Contact management**: • Pregnant contacts should be advised to consult with the health care provider immediately. • Assess the vaccination status of identified contacts and immunize where appropriate. • Alert contacts about signs and symptoms that can occur within 21 days after exposure. • Advise the contact to seek medical attention promptly should symptoms develop. • Complete the *Vaccine Preventable Diseases Contact Investigation Form* dated March 2014 or later (section 7.8.3). Include additional pages for contact information as necessary.
Outbreaks	Contact your Regional Communicable Disease Coordinator (RCDC) if even a single case of Rubella is suspected.
Health Education	• Educate the case about Rubella, including the infectious period (from 7 days before the onset of rash to at least 4 days after the onset of rash and the need for isolation from susceptible contacts and public places during this period. • Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing and before preparing foods and eating. • Use of appropriate rubella-containing vaccine as per the Nunavut publicly funded immunization schedules.
Health Settings Management	
Infection Control Measures in Health Care Settings	Droplet and contact precautions
Occupational Health	Health care workers should have known immune status and receive vaccination if not immune.
Surveillance	
Case Definition	**Confirmed case:** Laboratory confirmation of infection in the absence of recent immunization with rubella-containing vaccine: • Isolation of rubella virus from an appropriate clinical specimen **OR** • Detection of rubella virus RNA **OR** • Seroconversion or a significant (e.g. fourfold or greater) rise in rubella IgG titre, by any standard serologic assay, between acute and convalescent sera **OR** • Positive serologic test for rubella IgM antibody using a recommended assay in a person with an epidemiologic link to a laboratory-confirmed case or who has recently traveled to an area of known rubella activity **OR** • Clinical illness in a person with an epidemiologic link to a laboratory-confirmed case

	Probable Case: Clinical illness: • In the absence of appropriate laboratory tests **OR** • In the absence of an epidemiologic link to a laboratory-confirmed case **OR** • In a person who has recently traveled to an area of known rubella activity
Reporting Requirements and Forms	**Rubella is a notifiable infection in Nunavut:** 1. Notify your RCDC. 2. Complete the *Vaccine Preventable Disease Report Form* dated March 2014 or later (section 7.8.2) and the *Vaccine Preventable Diseases Contact Investigation Form* dated March 2014 or later (section 7.8.3). 3. Fax the form, within 24 hours of case notification, to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833 4. If you cannot contact your RCDC, contact the Territorial Communicable Disease Coordinator at 867-975-5734.

Tools

Guidelines	Not applicable
Materials & Resources	**Fact Sheet: Rubella**
Cross Reference	Nunavut Immunization Manual: Rubella Immunization section Nunavut Communicable Disease Manual: Congenital Rubella protocol (section 7.9.1)

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Measles-2011.pdf

Public Health Agency of Canada, 2006. Canadian Immunization Guide, Seventh Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 2, 2014.

7.9.1 Rubella, Congenital

Special Precautions/Considerations

Precautions: Droplet and Contact

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Rubella virus.
Clinical	
Clinical Presentation	Congenital Rubella Infection (CRI) occurs when the rubella virus is passed from an infected pregnant mother to her baby. Fetal infections with rubella, especially in the first 20 weeks of pregnancy, may be associated with spontaneous abortion, intrauterine death and a variety of other problems collectively known as Congenital Rubella Syndrome (CRS), which can occur as single or combined defects. Clinically compatible manifestations of Congenital Rubella: 1. Cataracts or congenital glaucoma 2. Congenital heart defect 3. Sensoineural hearing loss 4. Pigmentary retinopathy 5. Purpura 6. Hepatosplenomegaly 7. Microcephaly 8. Micro ophthalmia 9. Mental retardation 10. Meningoencephalitis 11. Radiolucent bone disease 12. Developmental or late onset conditions such as diabetes and progressive panencephalitis Moderate and severe cases of CRS are typically recognized at birth. In mild forms of the disease, however, the anomalies may not be obvious at birth but may become apparent within the first year of life. The risk of infection producing damage to the fetus evident at birth is as high as 90% if infection occurs in the first trimester, falling to 10-20% by the 16th week, and becoming very low by the 20th week of pregnancy and beyond. Diabetes mellitus has been recognized as a frequent late manifestation of CRS.
Diagnostics	Laboratory confirmation of CRI/CRS is done by: • Isolation of rubella virus from an appropriate clinical specimen • Positive serologic test for rubella-specific IgM in the absence of recent immunization with rubella-containing vaccine • Detection of rubella virus RNA (e.g. PCR) in an appropriate clinical specimen • Rubella-specific IgG persisting for longer than would be expected (approximately six months following birth) from passive transfer of maternal antibody, or in the absence of recent immunization. For a diagnosis of CRS, the infant must also have two clinically compatible manifestations as outlined in Clinical Presentation section. Often cases of CRS are diagnosed long after birth as clinical manifestations become apparent. For this reason there is no time limit for the diagnosis and reporting of CRS. Follow your regional laboratory procedures for testing.

Treatment	Supportive treatment as indicated. No specific treatment is available for Congenital Rubella.
Pathogen	
Occurrence	**Worldwide**: In many countries, sustained high levels of rubella immunization have drastically reduced or essentially eliminated rubella and CRS. **Canada**: Rubella vaccine was licensed in Canada in 1969, and since that time, the number of Congenital Rubella cases has decreased dramatically. CRI/CRS is a disease under national surveillance. The number of pregnant women who are susceptible to rubella varies significantly across provinces and territories. This may be due to provincial/territorial immunization practices before 1983 when Measles, Mumps, Rubella (MMR) immunization of children 12-15 months became routine in all provinces/territories as well as the rubella immunization status in immigrant women. **Nunavut**: No reported cases in Nunavut since 2000.
Reservoir	Humans
Transmission	The virus is transmitted through the mother's blood infecting the placenta and the fetus. Infection in the first 20 weeks of gestation is most often associated with CRS and congenital defects. Infection after the first 20 weeks is most often associated with CRI. When maternal infection occurs after the 20th week of gestation, congenital defects are rare.
Incubation Period	Not applicable
Communicability	Infants with CRI/CRS can shed the virus in their urine and nasopharyngeal secretions for a year or more.
Susceptibility and Resistance	The fetus is susceptible if the mother has no immunity to rubella and the mother acquires infection in pregnancy.
Public Health Management	
Case	• Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the parent or guardian. • The infant should be isolated after birth. Routine practices, as well as droplet and contact precautions should be strictly enforced. • Once discharged from hospital, only persons that are immune to rubella should have contact with and care for the infected newborn. • The attending physician may establish a schedule of nasopharyngeal swabs and urine cultures for the first year of life. • Children with CRI/CRS should be presumed infectious at least through to 1 year of age, unless nasopharyngeal and urine cultures are negative for virus after 3 months of age. • Monitor the infant for clinical manifestations. • Consult with specialists for infants with CRI/CRS, as appropriate.
Contacts	Susceptible (non-immune) persons should avoid contact with the infant until they are immunized. This is particularly relevant for non-immune pregnant women and children less than 12 months of age. The following individuals are considered susceptible: • Born in or after 1970. • No documented evidence of two doses of rubella-containing vaccine (the

	first dose given on or after the first birthday and an interval of at least one month between the two doses). • No history of physician-documented rubella infection. • No laboratory evidence of rubella immunity. **Contact management**: • Pregnant contacts should be advised to consult with their health care provider immediately. • Assess the vaccination status and immunize where appropriate. • Alert about signs and symptoms that can occur within 21 days after exposure. • Advise seeking medical attention promptly should symptoms develop.
Outbreaks	If a single case of Congenital Rubella is suspected, contact your Regional Communicable Disease Coordinator (RCDC).

Health Education	• Educate the case's family about rubella, including the infectious period (up to one year) and the need for isolation from susceptible contacts and public places during this period.
	• Immunize non-pregnant women of childbearing age with a rubella-containing vaccine who have no history of previous immunization or serologic immunity.
	• Pregnancy:
	  ○ Screen antibody status to determine susceptibility.
	  ○ Advise rubella-susceptible pregnant women to avoid individuals with rubella and report any contact with cases to their health care provider immediately.
	  ○ If exposed to rubella during pregnancy, serology should be done as soon as possible after the contact to determine susceptibility if this information is not readily available.
	• Women found to be susceptible should be vaccinated with a rubella-containing vaccine in the immediate postpartum period, preferably in hospital prior to discharge.
	• Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing and before preparing foods and eating.
	• Educate the public about the risks associated with sharing saliva-contaminated items (e.g. cigarettes, food, drinks, lipstick, etc.)
	• Use of appropriate rubella-containing vaccine as per the Nunavut publicly funded immunization schedules.
	• Travelers to areas with rubella activity should ensure they are immune.

Health Settings Management	
Infection Control Measures in Health Care Settings	Droplet and contact. Infants born with Congenital Rubella can shed the virus in their nose/throat secretions and urine until 1 year of age.
Occupational Health	Healthcare workers should have known immune status and receive vaccination if not immune.
Surveillance	
Case Definition	***Congenital Rubella Syndrome (CRS)*** **Confirmed case:** *Live birth*: two clinically compatible manifestations (any combination from Table

1, Columns A and B) with laboratory confirmation of infection:

- Isolation of rubella virus from an appropriate clinical specimen **OR**
- Detection of rubella virus RNA **OR**
- Positive serologic test for IgM antibody in the absence of recent immunization with rubella-containing vaccine **OR**
- Rubella IgG persisting for longer than would be expected (approximately six months after birth) from passive transfer of maternal antibody, or in the absence of recent immunization

Still birth: two clinically compatible manifestations with isolation of rubella virus from an appropriate clinical specimen

Probable Case:
In the absence of appropriate laboratory tests, a case that has at least

- Any two clinically compatible manifestations listed in Table 1, column A **OR**
- One manifestation listed in Table 1, column A, plus one listed in Table 1, column B

NOTE: The following cannot be classified as a case of CRS:

- Rubella antibody titre absent in the infant **OR**
- Rubella antibody titre absent in the mother **OR**
- Rubella antibody titre declining in the infant consistent with the normal decline after birth of passively transferred maternal antibody

Congenital Rubella Infection (CRI)

Confirmed case:
Laboratory confirmation of infection but with no clinically compatible manifestations:

- Isolation of rubella virus from an appropriate clinical specimen **OR**
- Detection of rubella virus RNA **OR**
- Positive serologic test for IgM antibody in the absence of recent immunization with rubella-containing vaccine **OR**
- Rubella IgG persisting for longer than would be expected (approximately six months after birth) from passive transfer of maternal antibody, or in the absence of recent immunization

Table 1: Clinically Compatible Manifestations of Congenital Rubella Syndrome

Column A	Column B
1. Cataracts or congenital glaucoma (either one or both count as one) 2. Congenital heart defect 3. Sensoineural hearing loss 4. Pigmentary retinopathy	1. Purpura 2. Hepatosplenomegaly 3. Microcephaly 4. Micro ophthalmia 5. Mental retardation 6. Meningoencephalitis 7. Radiolucent bone disease 8. Developmental or late onset conditions such as diabetes and progressive panencephalitis

Reporting Requirements and Forms	**Congenital Rubella is a notifiable infection in Nunavut:** Contact your RCDC. If you cannot contact your RCDC, contact the Territorial Communicable Disease Coordinator at 867-975-5734.

Tools

Guidelines	Not applicable
Materials & Resources	Fact Sheet: Congenital Rubella
Cross Reference	Nunavut Immunization Manual: Rubella Immunization section Nunavut Communicable Disease Manual: Rubella protocol (section 7.8.1)

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Congenital-Rubella-Infection-Syndrome-2011.pdf

Public Health Agency of Canada, 2006. Canadian Immunization Guide, Seventh Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 2, 2014.

7.10 Smallpox

Special Precautions/Considerations

Precautions: Droplet, Direct and Indirect Contact

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	The variola virus, a species of Orthopoxvirus. In 1979 the World Health Organization declared that Smallpox (variola) had been successfully eradicated worldwide, however it does remain as a potential bioterrorism weapon.
Clinical	
Clinical Presentation	See Clinical Illness in the Case Definition section.
Diagnostics	Consult your regional laboratory.
Treatment	Consult with a physician.
Pathogen	
Occurrence	Smallpox formerly occurred worldwide but has been eradicated; the last known human cases were reported in 1978.
Reservoir	Humans; no known animal or environmental reservoir. Currently, the virus is maintained only in two WHO-designated laboratories.
Transmission	Person-to-person. Infection usually occurred via the respiratory tract via droplets or skin inoculation. The conjunctiva or the placenta were occasional portals of entry.
Incubation Period	From 7-19 days; commonly 10-14 days to onset of illness and 2-4 days more to onset of rash.
Communicability	From the time of development of the earliest lesions to disappearance of all scabs (approximately 3 weeks). The risk of transmission appears to have been highest at the appearance of the earliest lesions through droplet spread from the oropharynx of the infected person.
Susceptibility and Resistance	All unvaccinated individuals are susceptible.
Public Health Management	
Case	Contact the Regional Communicable Disease Coordinator (RCDC) or Medical Officer of Health (MOH) on call.
Contacts	Contact RCDC or MOH on call.
Outbreaks	Contact RCDC or MOH on call.
Health Education	Not applicable
Health Settings Management	
Infection Control Measures in Health Care Settings	Droplet, direct and indirect contact precautions
Occupational Health	Not applicable
Surveillance	
Case Definition	**Confirmed Case** Laboratory confirmation of infection: • Isolation of variola virus from an appropriate clinical specimen (e.g., whole

	blood, lesion fluid, crust material) **OR** • Detection of variola virus nucleic acid (e.g., PCR) in an appropriate clinical specimen (e.g., whole blood, lesion fluid, crust material) **Probable Case** • Clinical illness (see below) in a person who has an epidemiological link to a laboratory-confirmed case or to a probable case of smallpox **OR** • Laboratory evidence of infection (negative stain electron microscopy identification of variola virus in an appropriate clinical specimen) **Suspect Case** Clinical illness (see below) in a person who does not have an epidemiological link to a laboratory-confirmed case or to a probable case of smallpox **OR** Atypical lesion (see below) known to be associated with the variola virus on a person who has an epidemiological link to a laboratory-confirmed or probable case **Clinical illness:** Smallpox is characterized by a febrile prodrome consisting of fever > 38.3° C and systemic symptoms (prostration, headache, back pain, abdominal pain and/or vomiting) which generally lasts 1-4 days and is followed by the development of a characteristic rash. The rash consists of deep, firm, well-circumscribed pustules that are mostly all in the same stage of development. The lesions are characteristically umbilicated. The lesions initially appear as macules, evolving into papules, vesicles and then pustules in a matter of days. Finally, crusted scabs form; they then fall off several weeks after the initial appearance of the rash. Lesions initially appear in the oral mucosa/palate and then progress in a centrifugal pattern to involve the face, arms, legs, palms and soles. Atypical presentations include flat velvety lesions that do not evolve into pustules and more severe forms with confluent or hemorrhagic lesions. **Atypical presentations of smallpox include:** Haemorrhagic lesions OR flat velvety lesions not appearing as typical vesicles nor progressing to pustules.
Reporting Requirements and Forms	**Smallpox is a notifiable infection in Nunavut:** Contact your RCDC immediately if during regular business hours, or the MOH on call if after regular business hours.

Tools

Guidelines	Not applicable
Materials & Resources	Not applicable
Cross Reference	Not applicable

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Smallpox-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 2, 2014.

7.11.1 Tetanus

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	*Clostridium tetani*, the tetanus bacillus, is a gram-positive spore-forming bacillus that produces a potent neurotoxin.
Clinical	
Clinical Presentation	Characterized by acute onset of hypertonia and/or painful muscular contractions (usually of the muscles of the jaw and neck), and generalized muscle spasms without apparent medical cause. Neonatal Tetanus, arising from contamination of the umbilical cord, is a common cause of infant mortality in developing countries. This generally results from a lack of passive immunity, that is, the mother being inadequately immunized. Clinical manifestations include generalized weakness and failure to nurse. Apnea is the most prominent cause of death in the first week of life and sepsis in the second week. Rigidity and spasms occur later in survivors. Complications from Tetanus include laryngospasm and spasm of the respiratory muscles interfering with breathing. Fractures of the spine or long bones may occur as a result of sustained contractions and convulsions. Aspiration pneumonia is a common late complication occurring in more than half of autopsied cases. The case-fatality rate ranges from 10 to over 80%, depending on age and quality of care available.
Diagnostics	History of injury or portal of entry may not be apparent. The organism is rarely recovered from the site of infection; therefore, culturing infected wounds is not generally helpful. The diagnosis is generally made based on symptoms. There is no diagnostic laboratory test for Tetanus.
Treatment	As directed by a physician. If Tetanus is suspected, contact your Regional Communicable Disease Coordinator (RCDC) immediately. Refer to the Tetanus and Tetanus Immune Globulin prophylaxis protocols in the Nunavut Immunization Manual.
Pathogen	
Occurrence	**Worldwide**: There is worldwide occurrence with approximately 50,000 deaths annually but disease is relatively uncommon in industrialized countries. Tetanus is more common in agricultural regions and in underdeveloped areas where immunization may not be adequate and there may be contact with animal feces. Tetanus is an important cause of death in rural and tropical areas in countries of Asia, Africa, and South America. Neonatal Tetanus accounts for approximately 50% of all tetanus deaths in developing countries. The worldwide tetanus mortality rate is approximately 50%, with the highest rates in the young, the elderly, and injection drug users. **Canada**: Tetanus is rare in Canada. The number of cases reported annually ranged from 1–7 (average 5) from the years 1990 to 2000. The immunization status of most cases was unknown. Males over the age of 50 years accounted for the majority of reported cases. **Nunavut**: No reported cases.

Reservoir	The organism is a normal member of intestinal flora in animals and humans; the source of infection is soil or fomites contaminated with animal or human feces containing the spores which can contaminate wounds of all types. Tetanus spores are ubiquitous in the environment.
Transmission	Spores are introduced into the bloodstream through wounds, lacerations or punctures that have been contaminated with soil, street dust or the feces of animals or humans. Spores are also transmitted into the body by contaminated street drug paraphernalia and contaminated skin.
Incubation Period	Usually 3-21 days, with a range from 1 day to several months. The average incubation period is 10 days; most cases occur within 14 days of exposure. In general, shorter incubation periods are associated with more heavily contaminated wounds, more severe disease and a worse prognosis.
Communicability	No direct person-to-person transmission.
Susceptibility and Resistance	Tetanus is a vaccine preventable disease; susceptibility is general in unimmunized or inadequately immunized persons. Active immunity is induced by the tetanus toxoid and persists for at least 10 years after full immunization. In order to maintain high levels of immunity, booster doses are required every 10 years. Recovery from tetanus infection may not result in immunity; second episodes can occur and primary immunization is indicated after recovery.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the *Vaccine Preventable Disease Report Form* dated March 2014 or later (section 7.11.2). 1. Treatment of clinical cases should not be delayed until laboratory confirmation. Treatment is under the direction of the attending health care provider in consultation with an infectious disease specialist. 2. Once recovered, persons with incomplete or no immunization should receive a complete primary series of tetanus-containing vaccine (or booster dose) according to the Nunavut publicly funded immunization schedule and the age of the case.
Contacts	No follow up is required; Tetanus is not transmitted person-to-person.
Outbreaks	Rare. Case clusters are possible with intravenous drug use.
Health Education	• Immunize children and adults according to the Nunavut Immunization Schedule. • Any individual who sustains a wound may be at risk if their tetanus immunization is not current. • Persons traveling to countries where Tetanus may be prevalent should ensure they are immune.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine precautions
Occupational Health	Maintain vaccination with booster every 10 years.

Surveillance

Case Definition	**Confirmed case:** Clinical illness (see below) without other apparent medical cause: • With or without laboratory evidence of *Clostridium tetani*, **AND** • With or without history of injury. **Clinical illness:** Clinical illness is characterized by acute onset of hypertonia and/or painful muscular contractions (usually of the muscles of the jaw and neck), and generalized muscle spasms without other apparent medical cause.
Reporting Requirements and Forms	**Tetanus is a notifiable infection in Nunavut:** 1. Notify your RCDC. 2. Complete the *Vaccine Preventable Disease Report Form* dated March 2014 or later (section 7.11.2). 3. Fax the form within 24 hours of case notification, to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833 4. If you cannot contact your RCDC, contact the Territorial Communicable Disease Coordinator at 867-975-5734.

Tools

Guidelines	Not applicable
Materials & Resources	Not applicable
Cross Reference	Nunavut Immunization Manual: Tetanus Immunization section

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Tetanus-2011.pdf

Canadian Immunization Guide, Evergreen Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 2, 2014.

7.12.1 Varicella

Special Precautions/Considerations

Precautions: Airborne and Contact

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Varicella is caused by the varicella zoster virus (VZV), a member of the *Herpes virus* group.
Clinical	
Clinical Presentation	Varicella (chickenpox) is an acute disease characterized by a pruritic (itchy) vesicular rash. The rash progresses rapidly from macules to vesicles to pustules and scabs over within a few days. Lesions appear in successive crops over 5 to 6 days following rash onset and are more abundant on the trunk, but are sometimes present on the scalp, mucous membranes of the mouth, respiratory tract, conjunctiva and rectal and vaginal mucosa. Lesions are pruritic and if infected cause scarring. The illness may or may not have a prodromal period which may include fever, malaise and upper respiratory tract infection. Varicella is generally considered a mild disease, however, 5-10% of otherwise healthy children develop complications that may be fatal. Complications may include secondary bacterial infections, soft tissue infections, otitis media, bacteremia, pneumonitis, osteomyelitis, septic arthritis, endocarditis, necrotizing fasciitis, toxic shock-like syndrome, hepatitis, thrombocytopenia, cerebellar ataxia and encephalitis. The risk of severe invasive group A streptococcal infection has been estimated at 40-60 times higher among previously healthy children with varicella. Adolescents, adults or immunocompromised hosts are more likely to have complications such as pneumonia, encephalitis, and death, with a case fatality rate 10-30 times higher than in children. In both adults and children, the majority who die from complications of varicella have no identifiable risk factor for severe disease. Maternal varicella occurring in the 5 days before to 2 days after birth may result in overwhelming infection of the neonate and a fatality rate as high as 30%. Recurrences of varicella-like rash have been reported by 4-13% of people who had previous varicella infection. Risk factors include having a first infection at a young age (less than 12 months of age) or having a mild first infection. The virus remains latent and may recur years later as herpes zoster (shingles). Exactly how the virus remains latent in the body and subsequently reactivates is not clearly understood. Breakthrough disease is defined as a case of wild-type varicella occurring after exposure to wild-type virus, more than 42 days following vaccination. A breakthrough infection is usually mild. Rash is frequently atypical, predominantly maculopapular with fewer than 50 skin lesions. There is a lower rate of fever and faster recovery. Vaccine recipients with mild breakthrough disease are approximately one-third as contagious as unimmunized children.
Diagnostics	The diagnosis of varicella has been most often made clinically by the health care provider through patient history and physical examination. Confirmation of disease is done by taking a lesion swab/scraping from

	the base of a fresh vesicular lesion and serology for VZV IgM and IgG. An IgM positive result may indicate an acute VZV infection. Seroconversion for VZV IgG may indicate a recent acute VZV infection; however, note that immunized and immunocompromised individuals may not develop a detectable VZV IgG response. Follow your regional laboratory procedures for testing.
Treatment	Supportive treatment as indicated. Consult with physician as needed. In persons under the age of 18 years, avoid the use of acetylsalicylic acid (ASA, Aspirin) because of the association with Reye's syndrome.
Pathogen	
Occurrence	**Worldwide**: Worldwide occurrence. In temperate climates, at least 90% of the population have had varicella disease by the age of 15 years and at least 95% of the population by young adulthood. The disease occurs most frequently in winter and early spring. In tropical countries the epidemiology of the disease is quite different. In these areas a higher proportion of cases occur among adults. **Canada**: The reporting of varicella across Canada is considered an underestimate of actual cases. In the pre-vaccine era the estimate was about 350,000 cases per year. The highest morbidity rates occur during the first year of life and after the age of 15. Varicella vaccine was licensed for use in Canada in December 1998. **Nunavut**: The varicella vaccine was included in the Nunavut childhood immunization schedule in 2002. Case counts began to decline after 2006 but cases still occur every year.
Reservoir	Humans
Transmission	Person-to-person by direct contact with VZV through droplet or airborne spread of vesicle fluid or secretions (including herpes zoster/shingles lesions) of the respiratory tract or indirectly by freshly contaminated fomites. Scabs are not infectious. Transmission during pregnancy to the fetus can also occur.
Incubation Period	From 10-21 days (range of 14-16 days). May be prolonged in the immunocompromised and after passive immunization against varicella (e.g. varicella-zoster immune globulin [VZIG]).
Communicability	As long as 5 days but usually 1-2 days before onset of symptoms and until the last lesions has crusted (usually about 5 days after the rash onset). The attack rate among susceptible contacts in household settings is estimated at 65-87%.
Susceptibility and Resistance	Susceptibility is universal in persons not previously infected or vaccinated; infection usually confers lifelong immunity. The virus remains latent in sensory ganglia and disease may recur years later as herpes zoster (shingles) in about 15% of adults and sometimes in children.
Public Health Management	
Case	Uncomplicated individual cases (confirmed and probable) of varicella do not require public health management. Children with varicella in daycare, preschool, or school settings should be excluded from these settings until 5 days after the start of the rash. The case is considered low risk for transmission when the rash is: (1) covered, (2) has crusted, or (3) in immunized people without crusts, until lesions are resolving. In circumstances when an immunocompromised individual is present in a work, school or daycare setting, the immunocompromised individual should be

	excluded (not the case) and referred to their health care provider (rationale: other individuals in the facility may be incubating varicella creating further potential exposures). This decision should be made on a case-by-case basis in consultation with the CMOH/DCMOH.
Contacts	Significant exposure to VZV is considered direct face-to-face contact with infected persons, or any direct contact with fluids from lesions or objects contaminated with this fluid (note that this also includes shingles lesions). Exposure to dried scabs from varicella or zoster lesions does not constitute significant exposure. A **varicella-immune individual** is any person with any one of the following: - self-reported history of varicella or herpes zoster - health care provider-diagnosed varicella or herpes zoster - documentation of positive VZV IgG
Outbreaks	If a higher than normal amount of disease activity is detected, contact your RCDC.
Health Education	• Encourage immunization for individuals eligible under the Nunavut Immunization Schedule. • Any woman who is identified to be varicella immune negative during prenatal care should be immunized in the post-partum period. • Administration of varicella immune globulin post exposure is not feasible in Nunavut. • Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing, before preparing foods and eating, and keeping fingernails short to prevent secondary infection. • Educate the public about the risks associated with sharing saliva-contaminated items (e.g. cigarettes, food, drinks, lipstick, etc.). • For herpes zoster/shingles, educate infected persons on keeping lesions covered. • Non-immune pregnant and immunocompromised individuals should avoid exposure to known infectious cases if possible.
Health Settings Management	
Infection Control Measures in Health Care Settings	Airborne and contact precautions. Varicella are small particles and travel and remain in the air for long periods of time. The drainage from lesions can be infectious. If there is fluid discharge from the lesions, contact precautions are needed, including careful cleaning of surfaces and covering of draining lesions if possible.
Occupational Health	• Healthcare workers should demonstrate proof of immunity when hired (proof of immunity may include history of disease, serological evidence of disease or documented age-appropriate doses of varicella vaccine). • Non-immune caregivers should be re-assigned, if for staffing reasons this is not possible, non-immune staff should wear a fitted N95 respirator. • Healthcare workers with shingles can continue to work as long as they are diligent about hand hygiene and are able to cover the shingles lesions.
Surveillance	
Case Definition	**Confirmed case:** Clinical evidence of illness and laboratory confirmation of infection:

	• Isolation or direct antigen detection of varicella-zoster virus (VZV) from an appropriate clinical specimen **OR** • Detection of VZV DNA **OR** • Seroconversion or a significant (e.g. fourfold or greater) by any standard serologic assay in varicella-zoster IgG titre between acute and convalescent sera **OR** • Positive serologic test for varicella-zoster IgM antibody **OR** • Clinical evidence of illness in a person with an epidemiologic link to a laboratory-confirmed case of chickenpox or VZV infection **Probable Case:** Clinical evidence of illness in the absence of laboratory confirmation or epidemiologic link to a laboratory-confirmed case.
Reporting Requirements and Forms	**Varicella is a notifiable infection in Nunavut**; however, surveillance is laboratory-based only. Submission of case report forms (routine or enhanced) is **not required**, unless specifically requested by the CMOH/DCMOH or designate.

Tools

Guidelines	Not applicable
Materials & Resources	**Fact Sheet: Chickenpox (Varicella)**
Cross Reference	Nunavut Immunization Manual: Varicella Immunization section

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Varicella-Chickenpox-2012.pdf

American Academy of Pediatrics (2012) Red Book®: Report of the Committee on Infectious Diseases (29th ed.). Elk Grove Village.

Public Health Agency of Canada. Canadian Immunization Guide, Evergreen Edition. Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on March 19, 2014.

8.0 Infections Spread By Direct Contact

Purpose

The purpose of this section of the Communicable Disease Manual is to provide guidelines for the investigation and management of individuals who have been diagnosed with notifiable infections spread by direct contact, including Group B Streptococcal Disease, Methicillin-Resistant *Staphylococcus aureus* (MRSA) and Viral Hemorrhagic Fevers.

Legislation/Policy

Authority for the reporting of notifiable infections spread by direct contact and the public health management comes from the *Public Health Act, Communicable Disease Regulations*.

All clients who have been diagnosed with a notifiable infection spread by direct contact must be reported to the Chief Medical Officer of Health (CMOH).

All clients who are suspected to have or have a confirmed notifiable infection spread by direct contact are to be followed as per the protocols in this section.

Roles and Responsibilities

Table 8.1 Roles and responsibilities for follow-up of notifiable infections spread by direct contact

Role	Responsibilities
Laboratory	• Report all laboratory-confirmed notifiable infections spread by direct contact to the CMOH or designate.
Health Care Provider team (e.g. Physician, Nurse Practitioner, Community Health Nurse, etc.)	• Test all clients suspected to have a notifiable infection spread by direct contact. • Treat all clients with a notifiable infection spread by direct contact. • Complete public health case and contact management (as applicable) of clients with a notifiable infection spread by direct contact. • Complete the appropriate case report form(s) and send it to the Regional Communicable Disease Coordinator (RCDC).
Regional Communicable Disease Coordinator	• Provide advice on a regional basis for the case and contact management (as applicable) of notifiable infections spread by direct contact. • Receive and review reports of notifiable infections spread by direct contact. • Consult with the Territorial Communicable Disease Consultant (TCDC) as required.
Territorial Communicable Disease Consultant	• Provide advice on a territorial basis for the case and contact management (as applicable) of notifiable infections spread by direct contact.
Epidemiologist	• Ensure cases are included in the communicable disease information system.
Chief or Deputy Chief Medical Officer of Health	• Be available for consultation on notifiable infections spread by direct contact. • Make program recommendations.

8.1.1 Group B Streptococcal Disease

Special Precautions/Considerations

Precautions: Contact due to blood and body fluid exposure until bathed then routine

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Group B *Streptococci* (*S. agalactiae*), gram-positive cocci.
Clinical	
Clinical Presentation	Group B *Streptococcus* (group B strep, GBS) is a type of bacteria that causes illness in people of all ages. It is the most common cause of some life-threatening infections in newborns; two distinct forms of invasive illness can occur in infants: • Early onset disease (1 to 7 days after birth) characterized by sepsis, respiratory distress, apnea, shock, pneumonia and meningitis. • Late onset disease (7 days to several months after birth) characterized by bacteremia, meningitis and other focal infections. **Note that only illness up to 28 days after birth is notifiable.** GBS is more likely to be fatal with early onset disease in comparison with late onset disease. The most common problems caused by GBS in adults are: • Bloodstream infections; • Pneumonia (infection in the lungs); • Skin and soft-tissue infections; and • Bone and joint infections. Rarely in adults, GBS can cause meningitis (infection of the fluid and lining surrounding the brain).
Diagnostics	Laboratory Criteria for Diagnosis requires the isolation of *S. agalactiae* by culture from a normally sterile site (e.g. blood or cerebrospinal fluid or, less commonly, joint, pleural or pericardial fluid). **It is essential to note that only invasive disease is reportable.** Follow your regional laboratory procedures for diagnostic testing.
Treatment	A discussion of the treatment of invasive GBS is beyond the scope of these guidelines. The case should be referred to an expert for further management.
Pathogen	
Occurrence	**Worldwide**: GBS is thought to occur worldwide. It is estimated that between 10 to 30% of women are vaginally colonized with GBS; approximately 70% of offspring may be colonized postnatal, but only approximately 1 to 2% develop symptomatic infection. **Canada**: Incidence in Canada and the United States has decreased with the introduction intrapartum chemoprophylaxis. There has been a dramatic decrease compared to the fatality rate of 70% three decades ago. **Nunavut**: There have been 2 reported cases between 1999 and 2011, one case in a newborn and the other in an adult.
Reservoir	Humans.

<table>
<tr><td>Transmission</td><td>Vertical transmission from mother to baby can occur in utero as a result of ascending infection. Additionally, if during delivery the neonate aspirates contaminated amniotic/vaginal fluid, or passes through the GBS-colonized birth canal, infection may occur. Risk is increased in infants delivered at <37 weeks and/or when rupture of membranes occurs 18 hours prior to delivery.

Once in the neonatal lung, it causes pneumonia. Sepsis results when the bacteria enter the bloodstream of the neonate. From there the bacteria can infect multiple neonatal organs, including the brain and heart. Late-onset disease is sometimes seen with strains of GBS that are not carried by the mother.

The source of infection for adults is unknown. Since GBS is a common organism in the gastrointestinal tract of men and women, this may be a source of some infection.</td></tr>
<tr><td>Incubation Period</td><td>For early onset disease, the incubation period is 1 to 3 days; disease is apparent at birth and the majority is apparent in the first 24 hours of life (range 0 to 6 days).

For late onset disease, the incubation period is 7 days to 4 weeks (range 7 days to 3 months).</td></tr>
<tr><td>Communicability</td><td>GBS is transmissible to infants during labour if the mother is colonized, however, a negative vaginal culture at the time of labour does not guarantee absence of colonization.</td></tr>
<tr><td>Susceptibility and Resistance</td><td>Newborns are most susceptible to the infection. Susceptibility of the newborn is based on both maternal and neonatal risk factors.
<table>
<tr><th>Maternal risk factors</th><th>Neonatal risk factors</th></tr>
<tr><td>Preterm labour (i.e. start prior to 37 weeks gestation);
Premature rupture of membranes (i.e. before 37 weeks gestation);
Membranes ruptured more than 18 hours before delivery;
GBS bacteriuria during current pregnancy;
Fever higher than 38°C during labour;
Previous infant with GBS infection;
Maternal poverty;
Pre-eclampsia;
Cardiac disease; and/or
Diabetes.</td><td>Prematurity (i.e. < 37 weeks gestation);
Very low birth weight infants (1000–1499 gm) are at much greater risk with up to 3% infected and mortality rate of up to 30%;
Prolonged neonatal hospitalization;
Endotracheal intubation, assisted ventilation; and/or
Surgery (presence of surgical wounds and drains).</td></tr>
</table>
Note: Approximately half of infected neonates do not have any of these risk factors.</td></tr>
<tr><td colspan="2">Public Health Management</td></tr>
<tr><td>Case</td><td>Contact and interview the case or the parent/guardian of the case. Complete the Bacterial Diseases Surveillance Form – Streptococcus agalactiae (Group B), dated February 2011 or later (section 8.1.2).</td></tr>
<tr><td>Contacts</td><td>No contact tracing necessary.</td></tr>
<tr><td>Outbreaks</td><td>If a higher than normal amount of disease activity is detected, contact your Regional Communicable Disease Coordinator (RCDC).</td></tr>
</table>

Health Education	• Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing and before preparing foods and eating. • Any pregnant woman who has previously had a baby with GBS disease should discuss this with her physician.
Health Settings Management	
Infection Control Measures in Health Care Settings	Contact due to blood and body fluid exposure until bathed then routine.
Occupational Health	Gloves and gown to protect exposed skin. Eye protection if there is risk of splashing.
Surveillance	
Case Definition	**Confirmed case:** Clinical illness in an infant less than 1 month of age with laboratory confirmation of infection: • Isolation of group B *Streptococcus* (*Streptococcus agalactiae*) from a normally sterile site (such as blood or cerebrospinal fluid) OR • Demonstration of group B *Streptococcus* DNA in a normally sterile site **Probable Case:** Clinical illness in an infant less than 1 month of age with laboratory confirmation of infection: • Demonstration of group B *Streptococcus* DNA in a normally sterile site
Reporting Requirements and Forms	**GBS is a notifiable infection in Nunavut:** 1. Complete the *Bacterial Diseases Surveillance Form – Streptococcus agalactiae (Group B)* dated February 2011 or later (section 8.1.2). 2. Fax the form, within 7 days of case notification, to the RCDC as follows: • Qikiqtaaluk: 867-975-4833 • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 3. If you cannot contact your RCDC, contact the TCDC at: 867-975-5734.
Tools	
Guidelines	None
Materials & Resources	**Fact Sheet: Group B Strep**
Cross Reference	Not applicable

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Streptococcal-B-Newborn-2011.pdf

Centers for Disease Control and Prevention. Group B Strep Infection in Adults. Available online at: http://www.cdc.gov/groupbstrep/about/adults.html

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on August 6, 2013.

8.2.1 Methicillin-Resistant *Staphylococcus aureus* (MRSA)

Special Precautions/Considerations

Precautions: Direct and indirect contact precautions

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Initially, Methicillin-Resistant *Staphylococcus aureus* (MRSA) was recognized as a hospital pathogen, often called healthcare-associated MRSA. During the past ten years unique and genetically different MRSA strains have become more prevalent in communities (community-associated MRSA). However, the difference between healthcare- and community-associated MRSA has been largely lost in recent years.
Clinical	
Clinical Presentation	The most frequently reported clinical presentation of MRSA is skin and soft tissue infections (SSTIs), particularly furuncles, carbuncles, and abscesses. The severity of SSTIs varies from mild superficial infections to deeper soft-tissue abscesses. Infections can also occur systemically (bacteremia), in bone and in other organs (e.g. lung). Recurrent MRSA skin infections and clustering of infections within a household are relatively common occurrences.
Diagnostics	**When to consider MRSA:** • As a potential pathogen when assessing abscesses, pustular lesions, boils and cellulitis; or if there is severe illness compatible with *Staphylococcus aureus* (*S. aureus*) in cases of septicaemia, osteomyelitis, necrotizing pneumonia, septic arthritis or necrotizing fasciitis. • In areas where >10-15% of community isolates of *S. aureus* are methicillin resistant (see section 8.2.2 for the most recent available information for your region). • Suspect MRSA when there is a poor response to beta-lactam therapy in individuals with presumed staphylococcal infection. Culture and susceptibility testing is the current standard for MRSA diagnosis in Nunavut. **Culture should be obtained for the following:** • **Previous MRSA infection in a patient who now presents with an infection consistent with MRSA, and for whom antibiotic therapy is required.** • For suspected *S. aureus* infection which has not responded to initial therapy. • For patients with two or more furuncles or abscesses within six months. • For patient with aggressive soft tissue infection in whom urgent antibiotic therapy is required. • For patients presenting with a severe or invasive episode (this should include blood culture). • Or, in consultation with the physician or Chief Medical Officer of Health (CMOH) or Deputy CMOH (for public health purposes). Specimens for culture of SSTIs need not be routinely obtained from all individuals presenting with minor skin infections. **Notes:** • MRSA testing is available through the regional laboratory route. • Swab the lesion (send pus) and collect the specimen in Plain Transport Media (RTM). The specimen should be stored and transported to the laboratory in accordance with usual protocols.

	• The laboratory requisition or Meditech entry should be completed with the patient name, DOB and HCP number.
	• Complete the **DynaLIFE Microbiology Requisition Form**. Fill in the "Wounds/Skin/Abscesses/Surgical specimens" section as follows:
	  ○ Under SITE, check the boxes "bacterial culture" and "other," and write "query MRSA."
	  ○ Under CLINICAL INFORMATION, check off the appropriate boxes for the specimen.
	  ○ It is not necessary to complete the "Antibiotic Resistant Organisms" section (e.g. do not check "MRSA screen," as this only tests for MRSA colonization. Testing for MRSA colonization is not recommended in Nunavut.)
	• If the DynaLIFE Microbiology Requisition Form is not available, complete the usual laboratory requisition form and under OTHER TESTS NOT LISTED, specify "Wounds/skin/abscesses specimen: bacterial culture, query MRSA."

Treatment	Refer to **section 8.2.3** for specific MRSA treatment recommendations by clinical presentation.
	• Warm soaks and compresses and/or incision and drainage only may be used for simple uncomplicated furuncles, without spreading erythema or systemic symptoms.
	• Provide non-hospitalized patients with a plan regarding outpatient follow-up if required, and to include instruction to return if their symptoms worsen or if no improvement occurs.
	• Factors that may influence the clinical decision to supplement incision and drainage with antibiotic therapy include (but are not limited to) the following:
	  ○ Presence of a carbuncle;
	  ○ Severity and rapid progression of the SSTI;
	  ○ Presence of associated cellulitis;
	  ○ Signs and/or symptoms of systemic illness;
	  ○ Associated patient co-morbidities or immune suppression (including diabetes);
	  ○ Children or the elderly;
	  ○ Location of the abscess in an area that may be difficult to drain completely;
	  ○ Location in the region of the head and neck, or in association with a bone or joint;
	  ○ Association with foreign material (eg. artificial joint, pacemaker);
	  ○ Association with septic phlebitis;
	  ○ Lack of response to initial treatment with incision and drainage alone.
	• Consultation with a physician would be mandatory in some of the cases listed above (e.g. foreign material infection).
	• Depending on clinical presentation, empiric antimicrobial therapy may be required. Local susceptibility data (see sections 8.2.2 and 8.2.4 for most recent available information) should guide treatment until antibiotic susceptibility results are available.
	• If a positive MRSA report is received on a patient already started on an antibiotic, re-examine the patient before prescribing another antibiotic. In vitro susceptibilities may not correlate with clinical response. If the infection is resolving, it may not be necessary to change the antibiotic.
	• Decolonization is not recommended as there is no data to support efficacy in the community setting and there is concern of further development of resistance.
	• If you are admitting or referring a MRSA positive patient to a health care facility, include this information on the referral forms. Patients positive for

	MRSA are placed on Contact Precautions in the hospital setting. **Note**: This document does not present all available treatment options; for scenarios not presented above refer to existing facility-specific clinical practice guidelines, the *Canadian Guidelines for the Prevention and Management of CA-MRSA* (see References section) or the *Clinical Practice Guidelines by the Infectious Diseases Society of America for the Treatment of MRSA Infections in Adults and Children* (sees Reference section).
Pathogen	
Occurrence	Factors that seem to influence outbreaks of MRSA in the community include the 6 C's: • ***Crowding*** – crowding and poverty are risk factors; • ***Contaminated*** items in the environment – poor hand washing, uncovered wounds, sharing clothing or towels, and poor cleaning of surroundings lead to contamination of the environment; • ***Contact*** – close body contact can increase the risk of spreading MRSA; outbreaks have occurred in contact sport teams such as wrestling/football; • ***Compromised*** skin – cuts and scrapes can become infected if not kept clean; • ***Cleanliness*** – lack of access to resources to maintain basic hygiene (such as water, soap, towels); • ***Carelessness*** over the use of antibiotics.
Reservoir	*S. aureus* are bacteria that commonly colonize the skin and nares of healthy people.
Transmission	MRSA, like *S. aureus* in general, is transmitted through direct contact between an infected person and an uninfected person or by indirect contact through touching contaminated objects or surfaces that are part of the infected person's environment.
Incubation Period	Variable and undefined.
Communicability	As long as purulent lesions continue to drain or the carrier state persists. Autoinfection may continue for the period of nasal colonization or duration of active lesions.
Susceptibility and Resistance	Susceptibility is greatest among the newborn and the chronically ill. Anyone can get MRSA. However, recent outbreaks have been seen among athletes, prisoners, and other groups of people who live in crowded settings and/or routinely share contaminated items. Lack of access to the resources to maintain hygiene, such as lack of hand washing, may facilitate spread of the bacteria. Outbreaks have also been seen among military recruits, daycare attendees and injection-drug users.
Public Health Management	
Case	Educate the case as per the section below on health education.
Contacts	No contact tracing is required. However, if household members of the case present with skin lesions, consider testing for MRSA and treating if applicable.
Outbreaks	If a higher than normal amount of disease activity is detected, contact your RCDC.

Health Education	**Use antibiotics wisely:**
	• Particular attention should be paid to judicious use of antibiotics in outpatient settings to avoid an expanding spectrum of antibiotic resistance among strains of MRSA and other organisms.
	• Treatment of viral infections with antimicrobials should be avoided.
	• Patient education regarding antibiotics should include:
	  ○ Taking the antibiotic on time;
	  ○ Taking the antibiotics until finished; do not stop when feeling well;
	  ○ Not sharing antibiotics with others.
	
	Preventing the Spread of MRSA at Home (information for the case)
	• Keep wounds and lesions covered with clean, dry bandages. This is especially important if the wound is draining.
	• Hand-wash often with plain soap and warm water, especially if you change your bandages or touch the infected area or anything that might have come in contact with the infected area.
	• Do not share personal items (e.g. towels, washcloths, razors, clothing and sports equipment) or other items that may have been contaminated by wound drainage.
	• Wash soiled linens and clothes with hot water and laundry detergent. Drying clothes in a hot dryer, rather than air-drying, may also help kill bacteria in clothes.
	• Wash utensils and dishes in the usual manner with soap and hot water or using a standard home dishwasher.
	• Avoid contact sports or other skin-to-skin contact until the infection has healed.
	• Inform health care providers of MRSA status (either positive or living with someone who is positive) whenever you are in contact with the health care facility so that appropriate disinfection measures can take place in the Health Centre/Hospital/Clinic.
	• Put used dressings in a plastic bag, tie the plastic bag and place it in garbage. Wash hands after handling dressings.
	
	Preventing the Spread of MRSA at Daycares and Schools
	The emphasis must be placed on the consistent application of hygienic measures to reduce the risk of transmission.
	• Isolation of children with MRSA in childcare settings or schools is not a practical solution and impacts negatively on the child's well-being.
	• In situations in which open lesions cannot be kept covered, consider temporary exclusion from the daycare or school setting until drainage can be contained.
	• Educate childcare providers, teachers, children and families on general hygiene practices (e.g. hand hygiene, washing hands before eating, after outdoor play, using the bathroom, respiratory etiquette and staying home if ill).
	• Ensure availability of products to allow hand hygiene to be performed. This includes access to liquid soap in pump dispensers, running water and paper towels to dry hands.
	• Structure activities to include opportunities for hand hygiene to be practiced.
	• Ensure that frequently touched surfaces (counter, desks and toys) are cleaned at least daily with a disinfectant solution (cavi-wipes, virex II 256, or the Disinfection Solution Fact Sheet).
	• Items soiled with body fluids should be cleaned and disinfected as soon as possible and before use by another child.

	Preventing the Spread of MRSA in Sports Settings MRSA transmission has been documented in several reports among athletes and contact sports participants. The following recommendations are made for this high-risk group: • Practice good hand hygiene. Use alcohol-based hand antiseptic rinse or gel when hand washing facilities are not available. • Individuals participating in sports should shower with soap and water after every practice or tournament. • Do not share hygiene items, such as bar soap or towels. • Ensure regular cleaning of communal bathing facilities and frequently touched surfaces. • Personal items (e.g. towels), should be laundered or cleaned after each use. • Clean or launder shared athletic equipment such as pads or helmets, at least once a week, but ideally after each use. • Assess skin regularly for any lesions. Refer wounds to appropriate healthcare personnel and assure little to no contact to other players. • Coaches and trainers should always use gloves when attending to an athlete's wounds. After performing care, hands should be either washed with soap and water or alcohol-based hand sanitizers. • Coaches should learn to recognize wounds that could potentially be infectious (profound redness, tenderness, pus collection). If an infection is suspected, refer the person (or parents/guardians) to the health care providers in your community. • Coaches should report any clusters of skin infections to the local community health centre and public health centre. **Preventing the Spread of MRSA in Food Establishments** • The enterotoxin from *S. aureus* can be transmitted through food and cause acute food poisoning. • Food handlers with boils, abscesses and other purulent lesions of hands and face should be temporarily excluded from work until lesions are healed. • Educate food handlers about strict food hygiene, sanitation and cleanliness of kitchens, proper temperature control, handwashing, cleaning of fingernails, and the danger of working with exposed skin, nose or eye infections, and uncovered wounds.
Health Settings Management	
Infection Control Measures in Health Care Settings	Direct and indirect contact precautions. All health centers should have **cavi-wipes** and **virex II 256** as their cleaners; both are effective against MRSA if manufacturer's instructions are followed. Both of these cleaners are used regularly at the hospital and supplied by the regular medical supply ordering route in your region. **Important Points to Remember:** **Routine Practices –** These are practices to be observed at all times for all interactions with patients regardless of the diagnosis. 1. Handwashing is key. Wash hands before and after every patient contact, after contact with a contaminated item and contact with open wounds (after glove removal). Wearing gloves does not replace handwashing.

	2. Environmental Control • Clean stretchers between clients; • Non critical patient equipment (B/P cuffs, infant scales, etc.) should be cleaned between clients; • Avoid over stocking of rooms with supplies which cannot be cleaned • Daily cleaning of all offices and reception areas, with special attention to high touch areas; 3. Book known MRSA clients at the end of the clinic day so that a thorough cleaning of the clinic is undertaken afterwards.
Occupational Health	Gown and gloves on entry and at all times while in patient's room.
Surveillance	
Case Definition	**Confirmed case:** Laboratory isolation of MRSA from any site in the body.
Reporting Requirements and Forms	**MRSA is a reportable infection in Nunavut**; however surveillance is laboratory-based only. Submission of case report forms (routine or enhanced) is **not required**, unless specifically requested by the CMOH/DCMOH or designate.
Tools	
Guidelines	Anti-infective Guidelines for Community-Acquired Infections ("Orange book")
Materials & Resources	**Fact Sheet: MRSA** **Fact Sheet for Coaches: MRSA** **Fact Sheet for Home Care Nurses: MRSA** **Fact Sheet for Home Care Nurses and Workers:** **MRSA Fact Sheet: Disinfectant Solution**
Cross Reference	Not applicable

References

Anti-Infective Review Panel and MUMS Guideline Clearinghouse. (2012) Anti-infective Guidelines for community-acquired infections. Toronto, ON: MUMS Guideline Clearing House.

British Columbia – Interim Guidelines for the Management of Community-Associated Methicillin-Resistant *Staphylococcus aureus* Infections in Primary Care February 2006. Available online at: http://www.bccdc.ca/NR/rdonlyres/4232735E-EC3F-44E1-A011-3270D20002AC/0/InfectionControl_GF_ManagementCommunityAssociatedMethicillin_nov06.pdf

Barton. M., et al., (2006). Guidelines for the Prevention and Management of Community-Associated Methicillin-Resistant *Staphylococcus aureus* (CA-MRSA). Canadian Journal Infectious Diseases Medical Microbiology; 17(Supplement C). Available online at: http://www.fields.utoronto.ca/programs/scientific/10-11/drugresistance/emergence/katz3.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Liu, C., et al., (2011). Clinical Practice Guidelines by the Infectious Diseases Society of America for the Treatment of Methicillin-Resistant *Staphylococcus Aureus* in Infections in Adults and Children. Clinical Infectious Diseases; 52(1-38). Available online at: http://cid.oxfordjournals.org/content/early/2011/01/04/cid.ciq146.full.pdf

Manitoba Health, 2001. Communicable Disease Management Protocol – Methicillin-Resistant *Staphylococcus aureus* Infection. Available online at: http://www.gov.mb.ca/health/publichealth/cdc/protocol/meth.pdf

Newfoundland and Labrador Department of Health and Community Services (2010). Community-Associated Methicillin-Resistant *Staphylococcus Aureus*: A Practical Guide for Primary Care Practitioners. Available online at: http://www.health.gov.nl.ca/health/publichealth/cdc/community_associated_MRSA.pdf

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on July 17, 2013.

8.2.2 Proportion of Community Isolates of *Staphylococcus aureus* that are Methicillin-Resistant *Staphylococcus aureus* (MRSA), by region, 2012.

Based on laboratory reports received in 2012.

As antibiotic susceptibility patterns can change over time, the table will be updated regularly.

Region	Total number of *S. aureus* isolates	Percentage of isolates that are MRSA
Baffin	389	11.6%
Kitikmeot	184	28.8%
Kivalliq	355	47.3%

8.2.3 Recommendations for the Treatment of Methicillin-Resistant *Staphylococcus aureus* (MRSA) Skin and Soft Tissue Infections (SSTI)

Note: This table is not intended to replace existing clinical management guidelines. For serious cases, nurses should consult with community physicians prior to treatment. For clinical manifestations of MRSA infection not presented here, refer to existing facility-specific clinical practice guidelines:

1) The *Canadian Guidelines for the Prevention and Management of CA-MRSA 2006* (see References section). Available online at: http://www.fields.utoronto.ca/programs/scientific/10-11/drugresistance/emergence/katz3.pdf
2) The *Clinical Practice Guidelines by the Infectious Diseases Society of America for the Treatment of MRSA Infections in Adults and Children 2011* (see Reference section). Available online at: http://www.gov.mb.ca/health/publichealth/cdc/protocol/meth.pdf
3) Local susceptibility data (sections 8.2.2 and 8.2.4) should guide treatment until antibiotic susceptibility results are available.

Manifestation	Treatment	Adult Dose‡	Paediatric Dose‡	Comments
Abscess, furuncles, carbuncles	Incision and Drainage			May be adequate for simple boils & abscesses. Consider the addition of antibiotic therapy in the following situations: 1. Presence of a carbuncle. 2. For children or the elderly. 3. Associated comorbidities or immunosuppression (including diabetes). 4. Signs and/or symptoms of systemic illness. 5. Abscess in area difficult to drain completely. 6. Severe/extensive disease (involving multiple sites of infection) or rapid progression in presence of associated cellulitis. 7. Location in the head and neck, or in association with a bone or joint. 8. Association with foreign material (eg. artificial joint, pacemaker). 9. Associated with septic phlebitis. 10. Lack of response to initial treatment with incision and drainage alone.
Furuncle associated with cellulitis (defined as cellulitis associated with purulent drainage or pus in the absence of a drainable abscess) *Empirical therapy for MRSA is recommended pending culture results.*	TMP-SMX* plus Cephalexin	1–2 DS tab PO BID (lean towards the higher dose for larger patients or more serious infections)	8–12 mg/kg/**day** TMP component PO divided q12h	TMP–SMX is pregnancy category C/D and not recommended for women in the first or third trimester of pregnancy and for children <2 months of age.
	Clindamycin	300–450 mg PO QID	40 mg/kg/**day** PO divided q6h	• Use only for penicillin-allergic patients due to high rates of resistance. • *Clostridium difficile*-associated disease may occur more frequently, compared with other oral agents. • Considered safe in pregnancy.
	Doxycycline* plus Cephalexin	100 mg PO BID	≤ 45 kg: 2 mg/kg/**dose** PO every 12 h > 45 kg: adult dose	Tetracyclines are not recommended for children less than 8 years of age and are pregnancy category D.

Nonpurulent cellulitis (defined as cellulitis with no purulent drainage or exudate and no associated abscess) *Empirical therapy for infection due to MSSA and B-haemolytic streptococci is recommended.* *Empirical coverage for CA–MRSA is recommended in patients who do not respond to B–lactam therapy and may be considered in those with systemic toxicity.*	B–lactam (e.g. cloxacillin / cephalexin)	500 mg PO QID	Cloxacillin 50-100 mg/kg/**day** PO divided q6h Cephalexin 50-100 mg/kg/**day** PO divided q6h	Provides coverage for B–haemolytic streptococci and MSSA.
	Clindamycin	300–450 mg PO QID	40 mg/kg/**day** PO divided q6h	Provides coverage for B–haemolytic streptococci and MRSA (if susceptible).
	B–lactam (e.g. Cephalexin) **<u>and</u>** TMP-SMX or Doxycycline	Cephalexin 500 mg PO QID See above for TMP-SMX and doxycycline dosing	See above for TMP-SMX and doxycycline dosing	Combination provides coverage for B–haemolytic streptococci and MRSA.
Complicated or aggressive SSTI (patients with deeper or more extensive soft-tissue infections, surgical/traumatic wound infection, major abscesses, cellulitis, and infected ulcers and burns and/or with signs/symptoms of systemic infection)	Vancomycin	15-20 mg/kg/dose IV Q12H (may need to adjust to Q8H to achieve target trough levels for MRSA)	60 mg/kg/**day** IV divided q6h	Target troughs of 15-20 mg/L. Clindamycin may be added in cases of toxin-mediated syndrome.
	Clindamycin	600 mg IV Q8H	40 mg/kg/**day** IV divided q6h	

‡ Doses assume normal renal function.
* Does not provide coverage for B-haemolytc strep. Add a beta-lactam (e.g. cephalexin) if coverage for both CA-MRSA and B-haemolytic strep desired.

8.2.4 Nunavut Methicillin-Resistant *Staphylococcus aureus* (MRSA) Antibiogram, by region, September 2012–February 2013

An antibiogram, similar to the one below, summarizes the *in vitro* susceptibility patterns of bacteria to various antibiotics in a specific location and timeframe. The following table shows the percentage of MRSA isolates in Nunavut that are susceptible to the following antibiotics. These results are based on laboratory reports received between September 2012 and February 2013. As antibiotic susceptibility patterns can change over time, the antibiogram will be updated regularly.

In treating a skin and soft tissue infection for MRSA, the empiric use of an antibiotic would only be recommended if the susceptibility is known to be >80%. Based on the available data, clindamycin would not be recommended for the Kitikmeot region.

Antibiotic	Susceptibility (number of isolates)				Canada* (excludes NU, NWT & YK)
	Nunavut	**Baffin**	**Kitikmeot**	**Kivalliq**	
Clindamycin	88.6% (176)	83.8% (37)	68.4% (38)	98.0% (101)	88.7%
TMP-SMX	98.9% (178)	97.2% (36)	100.0% (40)	99.0% (102)	100.0%
Doxycycline/ Tetracycline (reported as Tetracycline)	100.0% (113)	100.0% (28)	100.0% (27)	100.0% (58)	100.0%
Vancomycin	100.0% (179)	100.0% (37)	100.0% (40)	100.0% (102)	100.0%
Linezolid	100.0% (27)	100.0% (4)	100.0% (7)	100.0% (16)	100.0%

* Canadian Antimicrobial Resistance Alliance. National Antibiogram 2011 for *S. aureus*, MRSA – community associated (CA-MRSA). Available at http://www.can-r.com/study.php?study=antb2011

8.3.1 Viral Hemorrhagic Fevers

Special Precautions/Considerations

Precautions: Airborne and Contact

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Viral Hemorrhagic Fevers (VHFs) are caused by RNA viruses of five distinct families: Arenaviridae, Bunyaviridae, Filoviridae, Flaviviridae, and Paramyxoviridae. Human cases or outbreaks of hemorrhagic fevers caused by these viruses occur sporadically and irregularly. The occurrence of outbreaks cannot be easily predicted. With a few noteworthy exceptions, there is no cure or established drug treatment for VHFs. The VHFs included in this Protocol are Crimean Congo Hemorrhagic Fever, Ebola Hemorrhagic Fever, Lassa Fever, Marburg Hemorrhagic Fever and Rift Valley Hemorrhagic Fever.

Crimean Congo VHF	A tick-borne virus *(Nairovirus)* in the family *Bunyaviridae*.
Lassa VHF	Lassa virus, an arenavirus
Ebola and Marburg VHF	*Ebolavirus* and *Marburgvirus* in the family Filoviridae
Rift Valley VHF	Rift Valley Virus, a phlebovirus

Clinical

Clinical Presentation	See Clinical Illness in the Case Definition section.
Diagnostics	Consult your local laboratory. Any testing related to suspected VHFs should be carried out under level 4 containment facilities (i.e. the National Microbiology Laboratory in Winnipeg, MB).
Treatment	As directed by a physician.

Pathogen

Occurrence	Survival of the virus causing VHF is dependent on an animal or insect host, and the viruses are geographically restricted to the areas where their host species live.

Crimean Congo VHF	Eastern Europe, particularly in the former Soviet Union, throughout the Mediterranean, in northwestern China, central Asia, southern Europe, Africa, the Middle East, and the Indian subcontinent.
Lassa VHF	Western Africa
Ebola and Marburg VHF	Unknown, despite extensive studies
Rift Valley VHF	Maintained in a continuous vertebrate-mosquito cycle

<table>
<tr><td>Reservoir</td><td>
<table>
<tr><td>Crimean Congo VHF</td><td>Ixodid (hard) ticks, especially those of the genus, Hyalomma, are both a reservoir and a vector for the virus</td></tr>
<tr><td>Lassa VHF</td><td>Wild rodents, particularly in Western Africa</td></tr>
<tr><td>Ebola and Marburg VHF</td><td>Unknown, despite extensive studies</td></tr>
<tr><td>Rift Valley VHF</td><td>Maintained in a continuous vertebrate-mosquito cycle</td></tr>
</table>
</td></tr>
<tr><td>Transmission</td><td>Humans are not the natural reservoir for the virus that causes. Humans are infected when they come into contact with infected hosts. However, with some viruses, infected humans can transmit the virus to another human.
<table>
<tr><td>Crimean Congo VHF</td><td>Transmission to humans occurs through contact with infected animal blood or ticks. Crimean Congo VHF can be transmitted from one infected human to another by contact with infectious blood or body fluids. Documented spread of Crimean Congo VHF has also occurred in hospitals due to improper sterilization of medical equipment, reuse of injection needles, and contamination of medical supplies.</td></tr>
<tr><td>Lassa VHF</td><td>Wild rodents, particularly in Western Africa</td></tr>
<tr><td>Ebola and Marburg VHF</td><td>Unknown, despite extensive studies</td></tr>
<tr><td>Rift Valley VHF</td><td>Maintained in a continuous vertebrate-mosquito cycle</td></tr>
</table>
</td></tr>
<tr><td>Incubation Period</td><td>See Clinical Illness in the Case Definition section.</td></tr>
<tr><td>Communicability</td><td>
<table>
<tr><td>Crimean Congo VHF</td><td>During the acute febrile phase when the virus is present in secretions and excretions</td></tr>
<tr><td>Lassa VHF</td><td>During the acute febrile phase when the virus is present in secretions and excretions</td></tr>
<tr><td>Ebola and Marburg VHF</td><td>Not communicable before the febrile phase and increasing with stages of illness, as long as blood and secretions contain virus</td></tr>
<tr><td>Rift Valley VHF</td><td>Not transmitted person-to-person</td></tr>
</table>
</td></tr>
<tr><td>Susceptibility and Resistance</td><td>All ages are susceptible.</td></tr>
<tr><td colspan="2"><h2>Public Health Management</h2></td></tr>
<tr><td>Case</td><td>Contact Regional Communicable Disease Coordinator (RCDC) if during regular business hours, or the Medical Officer of Health (MOH) on call if after regular business hours.</td></tr>
<tr><td>Contacts</td><td>Contact RCDC if during regular business hours, or the MOH on call if after regular business hours.</td></tr>
<tr><td>Outbreaks</td><td>Contact RCDC if during regular business hours, or the MOH on call if after regular business hours.</td></tr>
<tr><td>Health Education</td><td>Not applicable</td></tr>
</table>

Health Settings Management	
Infection Control Measures in Health Care Settings	Airborne and contact.
Occupational Health	Eye protection, double gloving, leg and shoe coverings and impermeable gowns. Special precautions when handling deceased bodies.
Surveillance	
Case Definition	**Confirmed Case** Suspect or probable case with laboratory confirmation of infection: • Detection of virus-specific nucleic acid (e.g. PCR) from an appropriate clinical specimen (e.g. blood, serum, tissue) **AND** • Demonstration of virus antigen in an appropriate clinical specimen (e.g. blood, serum, tissue) by EIA **OR** One of the above criteria PLUS laboratory confirmation using at least one of the following: • Demonstration of virus antigen in tissue (skin, liver or spleen) by IHA or IFA techniques • Demonstration of specific IgM antibody by EIA, IFA or Western Blot • Demonstration of a fourfold rise in IgM serum antibody by EIA, IFA or Western Blot **OR** Isolation of virus from an appropriate clinical specimen (blood, serum, tissue, urine specimens or throat secretions). **Probable Case** Clinical illness* and a history within the 3 weeks before onset of fever of one of the following: • Travel in a specific area of a country where an outbreak of viral hemorrhagic fever (VHF) has recently occurred, • Contact with a suspect, probable or confirmed case, • Direct contact with blood or other body fluid secretions or excretions of a person or animal with a confirmed or probable case of viral hemorrhagic fever, or • Work in a laboratory or animal facility that handles hemorrhagic fever viruses. **Suspect Case** Clinical illness* ***Clinical illness:** **Crimean Congo VHF:** Acute viral illness with sudden onset of fever, malaise, generalized weakness, anorexia, irritability, confusion, headache and pain in the limbs and groin. Fever generally lasts 5-12 days and is followed by a prolonged convalescent phase. Acute symptoms are usually accompanied by flushing, conjunctival injection and petechial or purpuric rash involving mucosal surfaces, chest and abdomen. Vomiting, abdominal pain and diarrheal are occasionally present. Bleeding may be seen from gums, nose, lungs, uterus and the GI tract.

	Lassa VHF: Acute viral illness lasting 1-4 weeks. Gradual onset of symptoms including fever, headache, generalized weakness, malaise, sore throat, cough, nausea, vomiting, diarrhea, myalgia and chest and abdominal pain. Fever may be absent or intermittent. Many cases are mild or asymptomatic. **Ebola and Marburg VHF:** Severe acute viral illness with sudden onset of fever, malaise, myalgia, headache, conjunctival injection, pharyngitis, vomiting and diarrhea that can be bloody. Often accompanied by a maculopapular or petechial rash that may progress to purpura. Bleeding from gums, nose, injection sites and the GI tract occurs in about 50% of cases. Dehydration and significant wasting occurs as the disease progresses. **Rift Valley VHF:** Usually associated with a brief, self-limited febrile illness. Most patients experience sudden onset of fever, malaise, severe myalgias with lower back pain, chills, headache, retro-orbital pain, photophobia and anorexia. Fever usually lasts 4 days.
Reporting Requirements and Forms	**Viral Hemorrhagic Fevers are notifiable infections in Nunavut.** Contact your RCDC immediately if during regular business hours, or the MOH on call if after regular business hours.

Tools

Guidelines	None
Materials & Resources	None
Cross Reference	Not applicable

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Viral-Haemorrhagic-Fever-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on August 6, 2013.

8.4.1 Clostridium difficile (C. difficile)

Special Precautions/Considerations

Precautions: Contact

Reporting

Notifiable: Yes

Reporting: Routine

Infectious Agent	Clostridium difficile is a gram-positive, spore forming, anaerobic bacillus. It is widely distributed in the environment and colonizes up to 3-5% of adults without causing symptoms. Some strains can produce two toxins that are responsible for diarrhea: toxin A and toxin B.
Clinical	
Clinical Presentation	C. difficile is a bacterium that causes mild to severe diarrhea and intestinal conditions such as pseudomembranous colitis (inflammation of the colon). Mild to moderate illness is characterized by watery diarrhea, low-grade fever and mild abdominal pain. Most cases of *C. difficile* occur in patients who are taking certain antibiotics in high doses or over a prolonged period of time. Some antibiotics can destroy a person's normal bacteria found in the gut, causing *C. difficile* bacteria to grow. When this occurs, the *C. difficile* bacteria produce toxins, which can damage the bowel and cause diarrhea. However, some people can have *C. difficile* bacteria present in their bowel and not show symptoms. There are many different strains of *C. difficile* and one strain, North American Pulsed Field type 1, known as NAP1, is likely to cause serious illness.
Diagnostics	Consult your regional laboratory to facilitate prompt identification of C. difficile infection.
Treatment	For people with mild symptoms, no treatment may be required. For more severe cases, medication and sometimes surgery may be necessary. There are also new treatments, such as fecal transplantation, currently being studied for treating persistent *C. difficile* infection.
Pathogen	
Occurrence	C. difficile is the most frequent cause of infectious diarrhea in hospitals and long term care facilities in Canada, as well as in other industrialized countries. Community-associated C.difficile disease is less common but is occurring with increasing frequency.
Reservoir	C. difficile can be isolated from the soil and is found commonly in the hospital environment.
Transmission	C.difficile is acquired from the environment or from stool of other colonized or infected people by the fecal-oral route
Incubation Period	The incubation period is unknown; colitis usually develops 5 to 10 days after initiating of antimicrobial therapy but can occur on the first day and up to 10 weeks after therapy cessation.
Communicability	
Susceptibility and Resistance	People in healthcare settings are most at risk because *C. difficile* is often a healthcare-associated infection. These infections can be transmitted within a hospital when infection prevention and control measures are not followed. Those at higher risk include the elderly, people with severe underlying illness, and people taking certain antibiotics (especially over a prolonged period of time) or

	cancer chemotherapy. In addition, patients taking stomach ulcer drugs, such as proton pump inhibitors, are at increased risk for contracting C. difficile infection.
Public Health Management	
Case	Determine if the case acquired C diff in the hospital using the following criteria: **Healthcare-associated CDI**: CDI is considered healthcare-associated if it meets the following criteria: • Patients CDI symptoms occur in a hospital ≥ 72 hours after admission OR • CDI is seen in a patient who had been hospitalized at your hospital and discharged within the previous **4 weeks** Discuss follow-up with CMOH
Contacts	Contact tracing is not required.
Outbreaks	Report the outbreak to RCDC or MOH on call.
Health Education	
Health Settings Management	
Infection Control Measures in Health Care Settings	Contact precautions.
Occupational Health	
Surveillance	
Case Definition	The diagnosis of C.difficile disease is based on the presence of diarrhea and of C.difficile toxins in a diarrheal stool specimen.
Reporting Requirements & Forms	Enteric, Food and Waterborne Investigation Form
Tools	
Guidelines	
Materials & Resources	**Fact Sheet: C. difficile**

References

Bouza E, Munoz P, Alonso R. Clinical manifestations, treatment and control of infections caused by Clostridium difficile. Clin Microbiol Infect. 2005 Jul;11 Suppl 4:57-64.

Nova Scotia Communicable Disease Manual, at : http://novascotia.ca/dhw/cdpc/cdc/documents/Clostridium-difficile.pdf

Public Health Ontario, at https://www.publichealthontario.ca/en/BrowseByTopic/InfectiousDiseases/Pages/Clostridium_difficile.aspx

Public Health Agency of Canada, at: http://www.phac-aspc.gc.ca/id-mi/cdiff-eng.php

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health, September 18, 2015

9.0 Infections Spread By Respiratory Routes

Purpose

The purpose of this section of the Communicable Disease Manual is to provide guidelines for the investigation and management of individuals who have been diagnosed with notifiable infections spread by respiratory routes, including Influenza, Invasive Group A Streptococcal Disease, Invasive Meningococcal Disease, Invasive Pneumococcal Disease, Legionellosis, Leprosy, Respiratory Syncytial Virus (RSV) and Severe Acute Respiratory Syndrome (SARS).

Legislation/Policy

Authority for the reporting of notifiable infections spread by respiratory routes and the public health management comes from the *Public Health Act, Communicable Disease Regulations*.

All clients who have been diagnosed with a notifiable infection spread by respiratory routes must be reported to the Chief Medical Officer of Health (CMOH).

All clients who are suspected to have or have a confirmed notifiable infection spread by respiratory routes are to be followed as per the protocols in this section.

Roles and Responsibilities

Table 9.1: Roles and responsibilities for follow-up of notifiable infections spread by respiratory routes

Role	Responsibilities
Laboratory	• Report all laboratory-confirmed notifiable infections spread by respiratory routes to the CMOH or designate.
Primary Care Provider team (e.g. Physician, Nurse Practitioner, Community Health Nurse, etc.)	• Test and treat all clients suspected to have a notifiable infection spread by respiratory routes as appropriate. • Complete public health case and contact management (as applicable) of clients with a notifiable infection spread by respiratory routes. • Complete the appropriate case report form(s) and send it to the Regional Communicable Disease Coordinator (RCDC).
Regional Communicable Disease Coordinator	• Provide advice on a regional basis for the case and contact management (as applicable) of notifiable infections spread by respiratory routes. • Receive and review reports of notifiable diseases spread by respiratory routes. • Consult with the Territorial Communicable Disease Consultant (TCDC) as required.
Territorial Communicable Disease Consultant	• Provide advice on a territorial basis for the case and contact management (as applicable) of notifiable infections spread by respiratory routes. • Consult with the CMOH as required. • Ensure cases are included in the communicable disease information system.
Chief or Deputy Chief Medical Officer of Health	• Be available for consultation on notifiable infections spread by respiratory routes. • Make program recommendations.

9.1.1 Influenza

Special Precautions/Considerations

Precautions: Droplet

Reporting

Notifiable: Yes
Reporting: Next Business Day

***Please also see the COVID-19 protocol in the Communicable Disease Manual for more information for the 2020-21 season on approach to respiratory infections and testing for COVID-19.**

Infectious Agent	Influenza viruses are classified into three distinct types on the basis of major antigenic differences: Influenza A, B and C. Influenza A is further categorized into subtypes based on the presence of two surface antigens: hemagglutinin (H) and neuraminidase (N).
Clinical	
Clinical Presentation	Influenza is an acute respiratory illness. Influenza-like illness (ILI) is defined as an acute onset of respiratory illness with fever **and** cough **and one or more of**: sore throat, arthralgia, myalgia, or prostration. Fever may not be prominent in the elderly and children less than five years old. Nausea, vomiting and diarrhea are uncommon; however, such symptoms may accompany the respiratory phase of the disease in children. In some cases it will be difficult to distinguish Influenza from other respiratory illnesses.
Diagnostics	The preferred specimen for seasonal influenza virus is the nasopharyngeal (NP) swab taken within the first three days of illness onset. Typically, when Influenza is first suspected in the community, take an NP swab for up to 5 patients that meet the ILI definition in a variety of age groups over a few days. *Note: due to the COVID-19 pandemic, a respiratory panel should be completed on <u>all individuals</u> presenting with ILI symptoms. See the COVID-19 Public Health Protocol for further guidance. See Appendix A for NP swab procedure.
Treatment	Care is typically supportive. Antiviral medications such as Oseltamivir (Tamiflu) may be used for the treatment of Influenza at the discretion of the prescribing practitioner. Refer to the Government of Nunavut Drug Formulary for more information.

Pathogen	
Occurrence	**Worldwide**: The annual global mortality rate is estimated to be approximately 1 million, with majority of deaths in those over 65 years, however this depends on circulating strain. **Canada**: It is estimated that in a given year there are up to 20,000 Influenza-related hospitalizations and between 4,000–8,000 Influenza-related deaths, predominantly in seniors. **Nunavut**: There have been hospitalizations and deaths related to Influenza; rates are not available for inclusion here at this time.
Reservoir	Primarily human; birds and mammals are likely sources of new human subtypes.
Transmission	Person-to-person by droplet spread. As droplets are released or shed from an infected person when they sneeze, cough or talk they can be propelled (generally up to 2 meters) through the air and deposited on the mouth or nose of people within this range. Though much less frequent, droplets may also be deposited on objects and spread infection to those touching the surfaces and bringing the virus to their mucous membranes.
Incubation Period	Usually 1-3 days.
Communicability	Adults may become infectious during the 24 hours prior to onset of symptoms until approximately 5–7 days after illness onset. Viral shedding in those infected usually peaks during the first three days of illness and ceases within 7 days but can be prolonged in children (greater than 10 days) and the immunocompromised.
Susceptibility and Resistance	The impact of epidemics and pandemics depends on the population immunity level, strain virulence, extent of viral antigenic variation and number of previous infections. Age-specific attack rates reflect persisting immunity from past infections and experience with similar strains; for this reason the infection incidence is often highest in school-aged children.

Public Health Management	
Case	Individual cases of Influenza do not require public health follow-up. No case report form is required. Please not the reporting requirements for individuals being tested for COVID-19 (e.g. respiratory infections) however. Advise individuals to stay away from common settings like work while ill to limit exposure to others, especially those at high risk for complications, until they are feeling well.
Contacts	Contact management of Influenza cases is not recommended.
Outbreaks	Call Regional Communicable Disease Coordinator (RCDC) if an increase in Influenza or ILI activity is noted.
Prevention Messaging	The best prevention measure is an annual influenza immunization. All Nunavut residents aged 6 months and older are eligible for publicly funded influenza vaccine yearly. Refer to the Influenza Immunization Program in section 11.1 of the Nunavut Immunization Manual for details. Basic personal hygiene is important in reducing transmission, e.g. covering nose and mouth when coughing or sneezing, coughing into the elbow or sleeve, regular hand hygiene. Prevention recommendations in residential group settings (Appendix B) and community settings (Appendix C and D) are also provided. **Note: If pneumococcal polysaccharide vaccine has not already been given, take the opportunity to vaccinate adults 50 and older as well as other high-risk individuals against pneumococcal disease when influenza vaccine is given. For more information about pneumococcal polysaccharide vaccines, refer to section 9.0 Active Immunization Protocols in the Immunization manual.**
Health Settings Management	
Infection Control Measures in Health Care Settings	Use routine practices and droplet/contact precautions. When triaging, suspect Influenza cases should be placed in a separate room away from other patients as soon as possible or separated by at least two meters from other people waiting if it is not possible to use another room Individuals suspected to have Influenza should be instructed to put on a surgical/procedural mask (with ear loops) while they are in the clinic, if tolerated. Thorough hand hygiene using either liquid soap and water or 60-90% alcohol-based sanitizer, before and after patient contact/assessment and after contact with contaminated equipment. When handling linen and garbage, if it is soiled or at risk of being soiled, create a barrier by wearing gloves and gowns that cover exposed contact skin areas. Usual procedures for cleaning and disinfecting rooms and patient care equipment are sufficient for Influenza. Increased frequency of cleaning may be required if there is increased incidence or in an outbreak situation.

Occupational Health	Staff should wear a surgical/procedural mask and eye protection when in close contact with the secretions of infected patients (within 2 meters). Staff providing clinical care to these patients should also wear gloves and gown/apron, as surfaces may be contaminated with infectious droplets. Annual influenza immunization.
Surveillance	
Case Definition	**1.0 Influenza-like Illness (ILI) Case Definition** • The sudden onset of respiratory illness with a history of fever and cough and one or more of the following: sore throat, arthralgia, myalgia or prostration which could be due to the influenza virus • In children under 5 years old, gastrointestinal symptoms may also be present • In patients under 5 or 65 years and older, fever may not be prominent **2.1 Influenza Case Definition** • Clinical illness* with laboratory confirmation of infection: o Isolation of influenza virus from an appropriate clinical specimen, **OR** o Demonstration of influenza virus antigen in an appropriate clinical specimen, **OR** o Significant rise (e.g. fourfold or greater) in influenza IgG titre between acute and convalescent sera, **OR** o Detection of influenza RNA. * Clinical illness is defined as ILI **Note:** Illness associated with novel influenza viruses may present with other symptoms. **3.0 Outbreak** In Nunavut, an influenza outbreak is defined as: A single laboratory-confirmed case of Influenza **AND** Reports of above-expected levels of ILI in the communities, via Viral Respiratory Illness Surveillance (see Reporting Requirements and Forms section)

Reporting Requirements and Forms	Influenza, regardless of type (e.g. Influenza A, Influenza B, pH1N1), is a reportable infection. A case report form is **not required** for influenza cases, however it is likely that a Person Under Investigation form for individuals being tested for COVID-19 would need to be submitted Report respiratory illness outbreaks, or any incident of viral respiratory illness causing death to RCDC immediately who will report these to the office of the Chief Public Health Officer (CPHO) (formerly the Chief Medical Officer of Health). Viral Respiratory Illness Surveillance is conducted in the communities (e.g. Community Health Centres, Public Health Units, and Qikiqtani General Hospital) each week during the influenza season. This provides information that can detect early outbreaks of influenza, and can be used to guide prevention and control activities. 1. A reminder will be sent from the RCDC **each Monday** during the influenza season (time period will vary every year and be specified by the PHO) that contains questions related to suspect viral respiratory illness activity in the community for the past week (Sunday to Saturday). 2. All questions should be answered and sent back to the RCDC **every Tuesday of the influenza season.** RCDCs will collate the information for their region and forward to the office of the CPHO **every Thursday by noon.**
Tools	
Guidelines	Nunavut Immunization Manual: Influenza Immunization Program section Canadian Immunization Guide (CIG): Influenza Statement on Seasonal Influenza Vaccines Public Health Agency of Canada (PHAC): Influenza Symptoms and Treatment **Guidance for influenza vaccine delivery in the presence of COVID-19**
Materials & Resources	Nasopharyngeal Swab Procedure: http://nuhealthintranet.com Flu Myths and Facts FluNU.ca Public Health Agency of Canada. FluWatch

References

Public Health Agency of Canada. An Advisory Committee Statement (ACS). National Advisory Committee on Immunization (NACI), Statement of Seasonal Influenza Vaccine for 2019-2020, May 2020.

Heymann D., editor. Control of Communicable Diseases Manual. 20th ed. Washington: American Public Health Association; 2015.

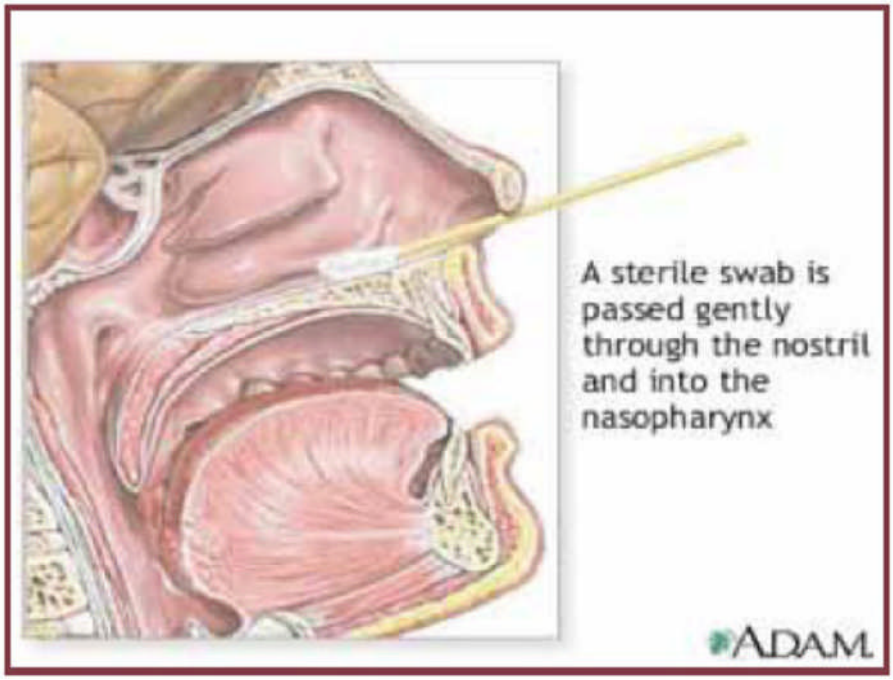
Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2019. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Jasmine Pawa, Deputy Chief Public Health Officer (Locum) on September 30, 2020.

Nasopharyngeal Swab Procedure

1. Use the swab supplied with the viral transport media.
2. Explain the procedure to the patient.
3. When you collect specimens, wear gloves and a mask. Change gloves and wash your hands between each patient.
4. If the patient has a lot of mucous in the nose, this can interfere with the collection of cells. Either ask the patient to use a tissue to gently clean out visible nasal mucous or clean the nostril yourself with a cotton swab (**not** the same swab you will be using to collect the specimen).
5. Estimate the distance to the nasopharynx; prior to insertion, measure the distance from the corner of the nose to the front of the ear; the swab should be inserted approximately half the length of this distance.
6. Seat the patient comfortably. Tilt the patient's head back slightly to straighten the passage from the front of the nose to the nasopharynx. This will make insertion of the swab easier.
7. Insert the swab along the medial part of the septum, along the floor of the nose, until it reaches the posterior nares; gentle rotation of the swab may be helpful (if resistance is encountered, try the other nostril, as the patient may have a deviated septum).
8. Cut the shaft of the swab with scissors, recap and place in a specimen bag with the requisition to be sent to the laboratory.



Appendix C
Influenza in Group Residential Settings

The following recommendations are made for the management of influenza in group residential settings (e.g. long-term care facilities, children's residential group homes, shelters, etc.):

Prior to Onset of Influenza Activity:

- Educate residents and staff on personal preventive measures
    - Encourage annual influenza immunization for all residents and staff
    - Reinforce hand hygiene, cough etiquette (e.g. cough into elbow/sleeve), environmental cleaning practices
    - Have a contingency plan to deal with staff illness

During Periods of Influenza Activity:

- Ask the facility to report increased ILI activity, laboratory-confirmed cases or suspected influenza/ILI outbreaks to the Community Health Nurse. Please advise the RCDC of these reports.
- Refer to the *Seasonal Influenza Antiviral Treatment Protocol Algorithm* in the GN Drug Formulary.
- Recommend that staff who are ill stay home and not work at the facility while symptomatic
- Recommend that those who are ill do not visit the facility
- Consider posting signage at entrances indicating that there is influenza activity in the facility (see attached)
- Increase the frequency of environmental cleaning

Antiviral Prophylaxis in the Group Residential Setting:

- Antiviral prophylaxis for influenza is often recommended in facilities with large numbers of residents at high-risk of acquiring influenza due to their housing arrangements and health status. However, the following realities exist in Nunavut:
    - Facilities generally have a small number of residents
    - Laboratory confirmation of influenza infection can take several days to weeks from the time of specimen collection to laboratory reporting
    - Only a small number of facilities have on-site nursing staff that could arrange/administer antiviral prophylaxis
    - The residents of the facilities are not always those considered to be at high risk of acquiring influenza and developing complications (i.e. all age groups exist within facilities)
- Given the above factors, antiviral prophylaxis for influenza in the group residential setting **is not** recommended in Nunavut

Please Note: The CMOH/DCMOH is available for consultation regarding influenza in group residential settings as required. Contact the RCDC to arrange this as necessary.

Caution

Residents/Staff of this facility are experiencing influenza like illness. Please do the following:

- If you or any member of your family is having respiratory symptoms, please return to visit when you or your relatives are well.
- If you are well, limit your visit to your relative or loved one. Do not visit other residents.
- Do not bring children to this facility until the respiratory illnesses clear.
- When you come in, wash your hands or use hand sanitizer.
- When you are leaving, wash your hands or use hand sanitizer.

Thank you. You are helping to protect the residents/staff of this facility.

Created October 2011

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Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble

Public Service Announcement

Flu season and vaccination in Nunavut

Start Date: October 13, 2020
End Date: December 31, 2020
Nunavut-wide **90 sec**

Flu season is here and the best way to protect yourself, your family and your community is to get vaccinated.

All Nunavummiut over six months of age are encouraged to get the flu vaccine. It is free and available at all community health centres in Nunavut, and at Iqaluit Public Health, building 1091.

Since COVID-19 has very similar symptoms as a cold or the flu, it is important that those who are able get their flu shots do so. While the flu shot does not protect against other viruses or bacteria, it can help reduce pressure on our health system, especially if COVID-19 is confirmed in a community.

Vaccines should arrive in all communities by mid-October. The vaccine can be given at any time in the season. Please be aware that the sooner you do receive it, the better you will be able to reduce your risk.

Due to COVID-19 precautions, you may have to book an appointment for your flu shot ahead of time. Please contact your health centre for more information.

Following these steps can help stop the spread of influenza, COVID-19, and other respiratory illnesses:

- Stay home when you feel sick.
- Cough or sneeze into your sleeve.
- Wash your hands often.
- Avoid touching your face.
- Throw used tissues in the trash right away.
- Keeping distance from others when out and about.
- Don’t smoke indoors or around others, especially babies.

###

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Communications

9.2.1 Invasive Group A Streptococcal Disease (iGAS)

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Invasive Group A Streptococcal (iGAS) Disease is caused by the gram-positive B-hemolytic bacterium, *Streptococcus pyogenes* (*S. pyogenes*).
Clinical	
Clinical Presentation	Symptoms preceding the onset of iGAS disease are variable and may include unusually severe pain, swelling, fever, chills, flu-like symptoms, myalgias, generalized macular rash, nausea, vomiting, diarrhea, malaise and joint pain. Clinical evidence of disease may manifest as several conditions including: • Streptococcal Toxic Shock Syndrome (STSS) • Necrotizing Fasciitis (NF) • Necrotizing Myositis (NM) • Meningitis STSS is the most serious manifestation of iGAS disease. It comprises a primary site of Group A Streptococcus (GAS) infection together with hypotension, adult respiratory distress syndrome (ARDS), renal impairment, rapid onset of shock and multi-organ failure. STSS has a mortality rate of up to 81%. Survivors can be left with severe long-term disability. Symptoms of NF and NM include fever, and a red painful swelling of tissue, which spreads rapidly. Death may occur in 12 to 24 hours. NF and NM are less severe than STSS; however they have a mortality rate of approximately 20%. The most common primary site of iGAS infections is soft tissue, but pneumonia, septic arthritis and primary bacteremia may also occur. Pneumonia with isolation of GAS from a sterile site, or from a bronchoalveolar lavage (BAL) non-sterile site when no other cause has been identified, should be regarded as a form of invasive disease for the purposes of public health management. Bacterial pharyngitis and cutaneous infections (e.g. impetigo, cellulitis) are non-invasive and less severe manifestations of GAS but are considerably more common. *S. pyogenes* may colonize the throat and skin of individuals (carriers) without symptoms and may be passed from person to person.
Diagnostics	Laboratory criteria for diagnosis require the isolation of Group A Streptococcus (*S. pyogenes*) by culture from a normally sterile site (e.g. blood or cerebrospinal fluid or, less commonly, joint, pleural or pericardial fluid). Follow your regional laboratory procedures for serologic testing.
Treatment	A discussion of the treatment of iGAS is beyond the scope of these guidelines.
Pathogen	
Occurrence	**Canada:** Incidence of iGAS is estimated to be 2.7 per 100,000, based on 2001 data. **Nunavut**: There were 33 cases between 1999 and 2011 (range 0-6 cases per year), with an average yearly rate of 8.9 per 100,000.

Reservoir	Humans.
Transmission	Generally person-to-person most commonly by: • Droplet spread when an infected individual coughs or sneezes; • Direct or indirect contact with the oral or nasal mucous membranes; • Direct or indirect contact with exudates from wounds or skin lesions; • Sharing of contaminated needles. Casual contact rarely leads to infection.
Incubation Period	Short, usually 1 to 3 days, rarely longer.
Communicability	Transmissibility generally ends within 24 hours of treatment. If untreated, uncomplicated cases are communicable for 10–21 days or until infection is resolved. Asymptomatic carriage is quite common (up to 15% of the population). In cases with purulent discharges, communicability extends for weeks or months.
Susceptibility and Resistance	Susceptibility is general. Incidence appears to be highest among young children (especially those with concomitant varicella), the elderly, and those with underlying medical conditions; however, the disease can occur in otherwise healthy children, adolescents, and adults. No gender or racial differences in susceptibility have been identified. A history of minor injury, blunt or penetrating trauma, surgery, and breaks in the skin or mucous membranes (e.g. sores, scratches, eczema, blisters, chickenpox, etc.) may be noted in cases of iGAS disease. It has been estimated that chickenpox increases the risk of severe iGAS infection among previously healthy children by 40-60 fold. The risk of iGAS infection among people living in the same household as a case is much higher than the rate of sporadic disease in the general population. The estimated attack rate among household contacts is estimated to be 3 per 1,000. Immunity only develops against the specific 'M' type of GAS and may last for years. The risk of iGAS is significantly associated with the following underlying conditions: age >65 years; injection drug use (IDU); heart disease; high dose steroid use (immunosuppressive doses); Diabetes Mellitus; cancer; varicella infection; alcohol abuse; chronic lung disease; skin trauma and HIV infection.
Public Health Management	
Case	Contact and interview the case. In situations where the case is too ill to be interviewed, information should be obtained from family, health care providers, etc. Complete the *Bacterial Diseases Surveillance Form – Streptococcus pyogenes (Group A)* dated February 2011 or later (section 9.2.2). **Educate the case about the following:** • Close contacts may be at increased risk for iGAS disease. Work with the case to identify and follow all close contacts (refer to Contact Management section); • Keeping all open cuts and sores bandaged until healed; • Not sharing drug snorting or smoking equipment such as straws or pipes, or injection equipment such as cookers, cotton, filters, water, syringes and needles.

Contacts

Because of the severity of iGAS disease and the increased risk of infection among close contacts (see below) of sporadic cases, aggressive contract tracing is essential to identify close contacts at increased risk of disease and administer chemoprophylaxis. **Please contact your Regional Communicable Disease Coordinator (RCDC) during regular business hours, or Medical Officer of Health (MOH) on call if after regular business hours for consultation on chemoprophylaxis.**

Definition of close contacts:

- Household contacts of a case spending at least 4 hours per day on average in the 7 days prior to onset (or 20 hours in the week prior to onset) with the case
- Non-household contacts who shared the same bed with the case or had sexual contact with the case in the 7 days prior to onset
- Persons who have had direct mucous membrane contact with the oral or nasal secretions of a case (e.g. mouth-to-mouth resuscitation, open mouth kissing) or unprotected direct contact with an open skin lesion of the case
- Injection drug users who have shared needles or equipment with the case

School classmates (kindergarten and older), work colleagues, as well as social or sports contacts of a case are usually not considered close contacts unless they fit into one of the above categories.

Important Notes:

1. Chemoprophylaxis should only be offered:
   a) To close contacts (see above) of a confirmed *severe case*. Severe cases are defined as those having the presence of STSS, soft-tissue necrosis (including NF, MF or gangrene), meningitis, GAS pneumonia, other life-threatening conditions or a confirmed case resulting in death; **AND**
   b) If close contacts have been exposed to the case during the period from 7 days prior to onset of symptoms in the case to 24 hours after the case's initiation of antimicrobial therapy.

2. Chemoprophylaxis of close contacts should be administered as soon as possible and preferably within 24 hours of case identification but is still recommended for up to 7 days after the last contact with a severe case.
3. Close contacts of all confirmed cases (i.e. regardless of whether the case is a severe one) should be alerted to signs and symptoms of invasive GAS and be advised to seek medical attention immediately should they develop febrile illness or any other clinical manifestations of GAS infection within 30 days of diagnosis in the index case.

All contact tracing investigations must be reported to the RCDCs by filling out and submitting the *Group A Streptococcal Disease, Invasive (iGAS) Contact Investigation Form* (section 9.2.3).

Recommended Chemoprophylaxis Regimens for Close Contacts*

Drug	Dosage	Comments
First-generation cephalosporins; cephalexin, cephadroxil, cephradine	**First line** Children and adults: 25 to 50 mg/kg daily, to a maximum of 1g/day in 2 to 4 divided doses x 10 days	Recommended drug for pregnant and lactating women. Should be used with caution in patients with allergy to penicillin. Use of cephalosporins with

			nephrotoxic drugs (e.g. aminoglycosides, vancomycin) may increase the risk of cephalosporin-induced nephrotoxicity.
	Erythromycin	**Second line** Children: 5 to 7.5 mg/kg every 6 hours or 10 to 15 mg/kg every 12 hours (base) x 10 days (not to exceed maximum of adult dose). Adults: 500 mg every 12 hours (base) x 10 days.	Erythromycin estolate is contraindicated in persons with pre-existing liver disease or dysfunction and during pregnancy. Sensitivity testing is recommended in areas where macrolide resistance is unknown or known to be ≥ 10%.
	Clarithromycin	**Second line** Children: 15 mg/kg daily in divided doses every 12 hours, to a maximum of 250 mg po bid x 10 days. Adults: 250 mg po bid x 10 days.	Contraindicated in pregnancy. Sensitivity testing is recommended in areas where macrolide resistance is unknown or known to be ≥ 10%.
	Clindamycin	**Second line** Children: 8 to 16 mg/kg daily divided into 3 or 4 equal doses x 10 days (not to exceed maximum of adult dose). Adults: 150 mg every 6 hours x 10 days.	Alternative for persons who are unable to tolerate beta-lactam antibiotics.
	*****For the management of selected child care or hospital contacts, refer to the *Guidelines for the Prevention and Control of Invasive Group A Streptococcal Disease* (see Reference section).		
Outbreaks	If a higher than normal amount of disease activity is detected, contact your RCDC.		
Health Education	• Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing and before preparing foods and eating. • Recommend varicella vaccine for those eligible, as the risk of acquiring iGAS infection is higher in persons with antecedent varicella infection. • Individuals with confirmed streptococcal pharyngitis (especially school aged children), should remain at home until at least 24 hours after beginning appropriate antimicrobial therapy.		
Health Settings Management			
Infection Control Measures in Health Care Settings	Routine.		
Occupational Health	Healthcare workers with clinically significant GAS infection should be excluded from work until completion of 24 hours of effective antibiotic therapy.		
Surveillance			
Case Definition	**Confirmed case:** Laboratory confirmation of infection with or without clinical evidence of invasive		

	disease*: • isolation of group A streptococcus (*Streptococcus pyogenes*) from a normally sterile site (blood, CSF, pleural fluid, pericardial fluid, peritoneal fluid, deep tissue specimen taken during surgery [e.g. muscle collected during debridement for necrotizing fasciitis], bone or joint fluid excluding the middle ear and superficial wound aspirates [e.g. skin and soft tissue abscesses]). **Probable Case:** Clinical evidence of invasive disease* in the absence of another identified etiology and with non-confirmatory laboratory evidence of infection: isolation of group A streptococcus from a non-sterile site **OR** • positive group A streptococcus antigen detection ***Clinical evidence of invasive disease:** Clinical evidence of invasive disease may be manifested as one or more of several conditions: • Streptococcal toxic shock syndrome (STSS), which is characterized by hypotension (systolic blood pressure ≤ 90 mm Hg in an adult and < 5 percentile for age for children) and at least two of the following signs: ▪ Renal impairment (creatinine level ≥ 177 µmol/L for adults); ▪ Coagulopathy (platelet count ≤ 100,000/ mm3 or disseminated intravascular coagulation); ▪ Liver function abnormality (SGOT, SGPT, or total bilirubin ≥ 2x upper limit of normal); ▪ Adult respiratory distress syndrome; ▪ Generalized erythematous macular rash that may desquamate. • Soft-tissue necrosis, including necrotizing fasciitis, myositis or gangrene. • Meningitis.
Reporting Requirements and Forms	**iGAS is a notifiable infection in Nunavut:** 1. Contact your RCDC immediately if during regular business hours, or the MOH on call if after regular business hours. 2. If you cannot contact your RCDC, contact the TCDC at: 867-975-5734. 3. Fill in and fax the *Bacterial Diseases Surveillance Form – Streptococcus pyogenes (Group A)* dated February 2011 or later (section 9.2.2) **and** the *Group A Streptococcal Disease, Invasive (iGAS) Contact Investigation Form* (section 9.2.3), within 24 hours of case notification, to the RCDC as follows: • Qikiqtaaluk: 867-975-4833 • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272
Tools	
Guidelines	Public Health Agency of Canada. Guidelines for the prevention and control of invasive Group A Streptococcal (GAS) disease. CCDR, 2006; 32 Supplement 2:1-26. Available online at the Nunavut Department of Health website: http://www.gov.nu.ca/health
Materials & Resources	**Fact Sheet: Group A Strep** **Fact Sheet: Necrotizing Fasciitis** Quick Reference for Close Contacts of a Case with invasive Group A Streptococcal Disease

Cross Reference	Not applicable

References

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Public Health Agency of Canada. Guidelines for the prevention and control of invasive Group A Streptococcal (GAS) disease. CCDR, 2006; 32 Supplement 2:1-26. Available online at the Nunavut Department of Health website: http://www.health.gov.nu.ca/en/HealthCareProfessionals.aspx

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on August 6, 2013.

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Guidelines for the Prevention and Control of Invasive Group A Streptococcal Disease

TABLE OF CONTENTS

1.0 Introduction

Before the introduction of antimicrobials, morbidity from *Streptococcus pyogenes* or group A streptococcal (GAS) infection was common. The introduction of penicillin and other antibiotics resulted in a steady decline in the incidence of GAS disease through the 1970s. However, in the 1980s, there was a worldwide resurgence of GAS infection, as well as an apparent increase in virulence[1-6].

Because of the severity of invasive GAS disease and the increased risk of infection among close contacts of sporadic cases, these guidelines have been formulated through a consensus process to advise public health officials and clinicians about the public health management of invasive GAS cases and their close contacts. Participants involved in the consensus process are listed in Annex 1.

2.0 Objectives

These guidelines have been prepared to assist in the public health investigation and management of invasive GAS disease in Canada. They address the following:

- surveillance and reporting
- public health response to cases
- chemoprophylaxis of close contacts
- investigation and control of invasive GAS disease in long-term care facilities (LTCF) and child care centres
- laboratory issues for *S. pyogenes* (Annex 2)
- infection control issues for invasive GAS infection (Annex 3).

3.0 Surveillance of Invasive GAS Disease in Canada

Invasive GAS infection is reportable in every province and territory (P/T) in Canada. Most jurisdictions rely on passive surveillance for identification of cases. Each P/T has procedures in place for the rapid notification of cases to medical officers of health and timely reporting to the appropriate P/T public health official. Readers should refer to the case definitions specified by their respective P/T jurisdictions for the purposes of local reporting.

S. pyogenes is a Gram-positive coccus, which occurs as pairs or as chains of short to moderate size[7]. Invasive GAS disease is confirmed through laboratory testing of specimens taken from normally sterile sites. Local microbiology laboratories perform antibiotic susceptibility testing for clinical purposes, whereas the National Centre for Streptococcus (NCS) conducts susceptibility testing for surveillance purposes only. Some provincial public health laboratories and academic reference laboratories may perform specific molecular analyses in support of outbreak investigations; however, the NCS is the only laboratory in Canada that performs M protein typing and *emm* gene sequencing of *S. pyogenes* isolates for routine surveillance. Serotyping, molecular sequencing and antimicrobial susceptibility testing are helpful in characterizing outbreaks, determining disease trends and guiding appropriate clinical management of cases and contacts. Annex 2 provides further details on laboratory support for outbreak investigation of invasive GAS disease.

Only confirmed cases of invasive GAS disease are notifiable at the national level. Currently, some P/Ts report case-by-case data with basic core variables on a monthly basis to the Notifiable Diseases Reporting System, and others report aggregate data by age, sex and month of episode.

4.0 Epidemiology of Invasive GAS Disease in Canada

Invasive GAS disease became nationally notifiable in January 2000. The most recent year for which complete national data have been published is 2001. The overall incidence of disease in 2001 was 2.7 per 100,000 population. The highest reported incidence rates occurred among adults ≥ 60 years of age (5.3 per 100,000), followed by children < 1 year of age (4.8 per 100,000) and children 1 to 4 years of age (3.6 per 100,000)[8]. Preliminary data for subsequent years show slight variation in overall incidence: 2.8 per 100,000 in 2002, 3.2 per 100,000 in 2003 and 2.6 per 100,000 in 2004 (unpublished data, Public Health Agency of Canada).

Elevated rates of invasive GAS disease have been detected among Aboriginals living in the Canadian Arctic through the population-based International Circumpolar Surveillance system. Between 2000 and 2002, no cases of invasive GAS disease were reported among non-Aboriginals in the territories, northern Quebec or northern Labrador. In contrast, among Aboriginals in northern Canada, the incidence rate of disease was 9.0 per 100,000 in 2000 (7 cases), 3.0 per 100,000 in 2001 (2 cases) and 5.0 per 100,000 in 2002 (4 cases)[9-11]. Preliminary data from 2003 also indicate a higher rate of invasive GAS disease in Aboriginal (2.6 per 100,000) compared with non-Aboriginal (1.9 per 100,000) populations (seven cases overall)[12].

The NCS provides laboratory reference services for GAS associated with invasive disease. Among 2,195 isolates from blood, brain or cerebrospinal fluid (CSF) between 1993 and 1999, the most frequent M protein type identified was M1 (28%), followed by serotypes M28 (9%), M12 (8%), M3 (8%) and M4 (6%)[13]. With the exception of 2000-2001, M1 was consistently the most frequently encountered serotype between 1992 and 2004-2005[13-16]. The NCS also tests *S. pyogenes* isolates for antibiotic sensitivity. Of 817 isolates from all sites tested in 2004-2005, 11.1% demonstrated resistance to erythromycin, and 2.0% were resistant to clindamycin. No isolates demonstrated resistance to penicillin, chloramphenicol or vancomycin[16].

Clinical data for cases of invasive GAS infection are not collected nationally. Data from the Ontario GAS Study provide further information on the epidemiology of invasive disease. In cases detected by this enhanced population-based surveillance system during 1992 and 1993, the most common clinical presentations were skin or soft-tissue infections (48%), bacteremia with no septic focus (14%) and pneumonia (11%)[17]. Thirteen percent of cases were classified as streptococcal toxic shock syndrome (STSS), and 6% had necrotizing fasciitis (NF). The overall case fatality rate (CFR) was 13%, although syndrome-specific CFRs were highest among patients with STSS (81%), NF (45%) and pneumonia (33%). Overall, 44 (14%) of infections were classified as nosocomial, including 14 cases acquired in LTCF for the elderly. The risk of invasive GAS disease was significantly associated with several underlying conditions, including HIV infection, cancer, heart disease, diabetes, lung disease and alcohol abuse. Among the isolates for which serotyping was available, the most common serotypes were M1 (24%), M12 (7.4%), M4 (6.5%), M28 (6.2%) and M3 (5.8%)[17]. More recent findings from Ontario enhanced surveillance system from 1992 through 1999 demonstrate the increasing incidence of specific clinical manifestations of invasive GAS infections. The annual incidence rate of NF increased from 0.08 per 100,000 population in 1992 to 0.49 per 100,000 in 1995 ($p < 0.001$)[18]. The annual incidence of GAS pneumonia increased from 0.16 per 100,000 in 1992 to 0.35 per 100,000 in 1999[19].

Enhanced GAS surveillance in Alberta between 2000 and 2002 showed higher provincial incidence rates of disease than observed through national passive surveillance, at 5.0 (in the year 2000), 5.7 (2001) and 3.8 (2002) per 100,000, with corresponding CFRs of 10.7%, 13.2% and 6.8%, respectively. Incidence rates were highest in the metropolitan regions of Calgary (6.9 per 100,000) and Edmonton (4.8 per 100,000). Acquisition in a hospital, nursing home or LTCF was the most frequently reported risk factor (17%), followed by injection drug use (13%), pregnancy-

related risk factors (13%), varicella (12%) and cancer (11%). The most common serotypes were M1 (16%), M3 (12%) and PT2967 (10%). There was seasonal variation, the greatest number of cases occurring in the winter and early spring months[20].

5.0 Definitions

5.1 National case definition

In Canada, confirmed cases of invasive GAS disease are notifiable at the national level. Probable cases of invasive GAS disease are not nationally notifiable (Table 1).

Table 1: National Case Definition for Invasive GAS Disease[21]

Confirmed case	Laboratory confirmation of infection with or without clinical evidence of invasive disease.* Laboratory confirmation requires the isolation of group A streptococcus (*Streptococcus pyogenes*) from a normally sterile site.
Probable case	Invasive disease* in the absence of another identified etiology and with isolation of GAS from a non-sterile site.

*Clinical evidence of invasive disease may be manifested as several conditions. These include:

a) STSS, which is characterized by hypotension (systolic blood pressure ≤ 90 mmHg in adults or < 5th percentile for age in children) and at least two of the following signs:
   i. renal impairment (creatinine level ≥ 177 μmol/L for adults)
   ii. coagulopathy (platelet count ≤ 100,000/mm^3 or disseminated intravascular coagulation)
   iii. liver function abnormality (SGOT [AST], SGPT [ALT] or total bilirubin ≥ 2 x upper limit of normal)
   iv. adult respiratory distress syndrome (ARDS)
   v. generalized erythematous macular rash that may desquamate;
b) soft-tissue necrosis, including necrotizing fasciitis, myositis or gangrene;
c) meningitis; or
d) a combination of the above.

SGOT = serum glutamic oxaloacetic transaminase; AST = aspartate aminotransferase; SGPT = serum glutamate pyruvate transaminase; ALT = alanine aminotransferase

A normally sterile site is defined as blood, CSF, pleural fluid, peritoneal fluid, pericardial fluid, deep tissue specimen taken during surgery (e.g. muscle collected during debridement for necrotizing fasciitis), bone or joint fluid. This does not include middle ear or superficial wound aspirates.

Pneumonia with isolation of GAS from a sterile site, or from a bronchoalveolar lavage (BAL) when no other cause has been identified, should be regarded as a form of invasive disease for the purposes of public health management; however, as BAL does not provide a sterile site specimen, the latter would not meet the national case definition and would not be nationally notifiable.

5.2 Definitions for public health management

Tables 2 and 3 provide definitions of cases and close contacts.

Table 2. Definition of Cases

Sporadic case	A single case of invasive GAS disease occurring in a community where there is no evidence of an epidemiologic link (by person, place or time) to another case.
Index case	The first case identified in an organization- or community-based outbreak. Identifying the index case in an outbreak is important for the characterization and matching of GAS isolate strains.
Subsequent case	A case with onset of illness occurring within 21 days and caused by the same strain as another case (including sporadic or index cases) and with whom an epidemiologic link can be established. Most subsequent cases in the community will occur within 7 days of another case.
Severe case	Case of STSS, soft-tissue necrosis (including NF, myositis or gangrene), meningitis, GAS pneumonia, other life-threatening conditions or a confirmed case resulting in death.

An epidemiologic link can be established when a person has one or both of the following in common with a confirmed case:

- contact with a common, specific individual (including confirmed or probable cases);
- presence in the same location (e.g. school, LTCF, child care centre) at or around the same time.

For public health management, cases that occur after the index case with whom an epidemiologic link can be established may have acquired the disease directly from the index case or from another common source.

Table 3. Definition of Close Contacts

- Household contacts of a case who have spent at least 4 hours/day on average in the previous 7 days or 20 hours/week with the case
- Non-household persons who share the same bed with the case or had sexual relations with the case
- Persons who have had direct mucous membrane contact with the oral or nasal secretions of a case (e.g. mouth-to-mouth resuscitation, open mouth kissing) or unprotected direct contact with an open skin lesion of the case
- Injection drug users who have shared needles with the case
- Selected LTCF contacts (see Section 6.3)
- Selected child care contacts (see Section 6.4)
- Selected hospital contacts (see Annex 3)

In order to be considered a close contact, there must have been exposure to the case during the period from 7 days prior to onset of symptoms in the case to 24 hours after the case's initiation of antimicrobial therapy. School classmates (kindergarten and older), work colleagues, as well as social or sports contacts of a case are not usually considered close contacts, unless they fit into one of the categories in Table 3.

An outbreak is defined as increased transmission of GAS causing invasive disease in a population. Outbreaks of invasive GAS disease do not occur in the community frequently and typically involve two cases (i.e. case-pairs) who have had close contact[17,22,23]. Criteria defining the impetus for action for organization-based outbreaks or clusters are found in Table 4.

Table 4. Impetus for Action for Organization-based Outbreaks or Clusters

Long-term care facility	An incidence rate of culture-confirmed invasive GAS infections of > 1 per 100 residents per month or at least two cases of culture-confirmed invasive GAS infection in 1 month in facilities with fewer than 200 residents or an incidence rate of suggested invasive or non-invasive GAS infections of > 4 per 100 residents per month.
Child care centre	One severe case of invasive GAS disease in a child attending a child care centre.
Hospital	One or more linked invasive or non-invasive GAS cases in either patients or staff occurring within 1 month of an invasive GAS case (see Annex 3).

6.0 Management of Invasive GAS Disease

The public health response to a sporadic case of invasive GAS disease, as described in Section 5.1, includes management of the case, contact identification and tracing, and maintenance of surveillance for further cases. The management of invasive GAS disease is divided into four subsections: the management of cases, contact management, management of cases occurring at LTCFs and management of cases occurring among children attending child care centres. Information about management in the hospital setting can be found in Annex 3.

6.1 Case management

Although this document is not focused on the treatment of GAS disease, where there is a strong clinical suspicion of invasive GAS disease a specimen from a normally sterile site should be obtained for culture, if possible, and empiric therapy started quickly. Confirmatory culture is important to ensure that GAS infection is diagnosed.

Laboratory testing of antimicrobial sensitivity of the GAS strain may be useful for determining appropriate antibiotic therapy. Readers should refer to treatment guidelines that address the clinical management of invasive GAS disease, which is beyond the scope of this document[24-26].

The case or a proxy for the case should be interviewed to determine close contacts.

6.2 Contact management

The cornerstone of prevention of secondary cases of invasive GAS is aggressive contact tracing to identify people at increased risk of disease (i.e. close contacts). Close contacts of an invasive GAS case may be at increased risk of secondary disease[17,22,27]. It is important that they should be alerted to signs and symptoms of invasive GAS disease and be advised to seek medical attention immediately should they

develop febrile illness or any other clinical manifestations of GAS. Persons who are close contacts of cases are defined in Table 3. The recommendations for contact management in Canada are shown in Table 5. Recommended chemoprophylaxis regimens are discussed in Section 7.0.

The following were considered in determining further management of close contacts: evidence of GAS transmission, reasonable theoretical risk, limited evidence of effectiveness of chemoprophylaxis, risks and benefits of chemoprophylaxis and the number of close contacts who would need to receive chemoprophylaxis to prevent a case. The recommendations for contact management are based on expert opinion and very limited evidence.

- ***The risk of subsequent infection in household contacts is estimated to range between 0.66 and 2.94 per 1,000, and this estimate is based on extremely small numbers of subsequent cases. Most subsequent cases in the Ontario GAS study occurred within 7 days after last contact with an infectious case.***

Two population-based studies have estimated that the rate of invasive GAS infection among people living in the same household as a case is much higher than the rate of sporadic disease in the general population. The Ontario Group A Streptococcal Study estimated that the attack rate among household contacts was 2.94 per 1,000 (95% confidence interval [CI]: 0.80-7.50)[17,27]. In comparison, the attack rate among household contacts estimated using data from the US Active Bacterial Core Surveillance (ABCs)/Emerging Infections Program network was 0.66 per 1,000 (95% CI: 0.02-3.67)[22]. There are two major limitations of these estimates: first, household contacts and attending physicians were not asked about the use of chemoprophylaxis; and second, these attack rates are based on extremely small numbers of subsequent cases and therefore may be unstable, as exemplified by the large confidence intervals[22].

In a follow-up study of clusters identified through enhanced surveillance in England, Wales and Northern Ireland during 2003, five household clusters were identified. The clusters included two spouse pairs and three mother-neonate pairs, which is in contrast to the clusters identified in the Ontario study (three spouse pairs, one adult sibling pair) and in US ABC surveillance (one father-infant daughter pair). According to the UK data, infections in either the mother or child in the neonatal period (first 28 days of life) were considered as carrying a high risk of further cases in the mother or baby. The risk estimates for other household contacts suggested that over 2,000 close contacts would need chemoprophylaxis to prevent a subsequent case, assuming 100% effectiveness of chemoprophylaxis[28].

- ***The risk of subsequent infection for non-household close contacts has not been quantified, but there is a reasonable theoretical risk that invasive GAS disease can be transmitted to these persons.***

There is little evidence that GAS has been transmitted to non-household close contacts after unprotected direct contact, prolonged mucous membrane contact or contact with oral or nasal secretions of a case; however, this was felt to be biologically plausible and was therefore included. Direct mucous membrane contact should be prolonged for a person to be considered this type of non-household close contact. This would include close contact, such as mouth-to-mouth resuscitation or open mouth kissing, but exclude kissing with closed mouths and sharing of utensils, water bottles or cigarettes. A firefighter developed toxic shock syndrome and cellulitis within 24 hours of performing cardiopulmonary resuscitation on a child with STSS using a bag-valve mask apparatus. The close temporal relation and the isolation of the same GAS strain from the child's blood and CSF and from the hand wound of the firefighter suggest the transmission of GAS during resuscitation or while cleaning secretions from the resuscitation equipment[29].

Three Swiss studies have demonstrated the occurrence of clusters of clonal strains causing endemic or epidemic infection among injection drug users living or purchasing drugs in the same region[30-32]. A case report from Israel reported the occurrence of invasive GAS isolates of the same serotype in a couple who regularly shared needles for injecting drugs[33].

Several studies have shown that, compared with rates in the general population, rates of pharyngeal carriage of the same strain of GAS are higher among close contacts spending at least 24 hours with an index case in the week preceding onset of illness[34], among residents and staff at the LTCF of the case[35,36] and among children sharing the same room as a case in a child care centre[37-39]. Asymptomatic pharyngeal carriage or acute streptococcal pharyngitis among such persons may contribute to the spread of invasive infection.

- ***Decisions about chemoprophylaxis must take into account the individual and population risks and benefits of this intervention.***

While prophylaxis of close contacts may be intuitively attractive, there is limited evidence that such prophylaxis is effective, and it is possible that prophylaxis may not be uniformly effective because of widespread transmission of *S. pyogenes* in the community.

The consequences of prophylaxis must also be considered. Serious adverse effects associated with the antibiotics used for prophylaxis are very rare but do occur. In addition, use of antibiotics clearly selects for antibiotic resistance and may have an impact on antibiotic resistance patterns. Finally, contact tracing and follow-up affect public health resources, which are scarce and must be directed to where they have the greatest benefit.

Based on an estimate that approximately 300 close contacts of an invasive GAS case would need to receive chemoprophylaxis to prevent one secondary case, that there would be an average of 10 contacts per case, a retail cost of $30 per person for antibiotics and approximately 3 hours of public health nurse follow-up time per case, at $50 per hour, the cost-effectiveness has been estimated to be $13,500 CAD in direct health care costs per secondary case prevented. This cost-effectiveness is within the range of other recommended public health preventive measures[40].

On the basis of these considerations, the working group consensus is that chemoprophylaxis is indicated only for contacts at the highest risk of acquisition of the organism and of subsequent severe disease. This explains why prophylaxis is not routinely recommended for contacts of cases that are not severe (see Table 2) (e.g. bacteremia or septic arthritis). Such cases have milder disease than others with invasive GAS, and their contacts are also likely to have milder disease, as there is some degree of consistency in the type and severity of disease caused by a particular GAS strain. The level of risk may vary for different groups, and there may be individual circumstances under which different decisions regarding chemoprophylaxis may be made.

The approach for contact management and recommended chemoprophylaxis varies by country[27,28]. The uncertainties in this decision-making process also explain why recommendations from various authorities will continue to differ, and as additional evidence becomes available these guidelines may need to be revisited.

Table 5. Recommendations for Contact Management

- Chemoprophylaxis should only be offered
  - to close contacts (see Table 3) of a confirmed severe case (see Table 2), that is, a case of STSS, soft-tissue necrosis (including NF, myositis or gangrene), meningitis, GAS pneumonia, other life-threatening conditions or a confirmed case resulting in death; AND
  - if close contacts have been exposed to the case during the period from 7 days prior to onset of symptoms in the case to 24 hours after the case's initiation of antimicrobial therapy.
- Chemoprophylaxis of close contacts should be administered as soon as possible and preferably within 24 hours of case identification but is still recommended for up to 7 days after the last contact with an infectious case.
- Close contacts of all confirmed cases (i.e. regardless of whether the case is a severe one) should be alerted to signs and symptoms of invasive GAS disease and be advised to seek medical attention immediately should they develop febrile illness or any other clinical manifestations of GAS infection within 30 days of diagnosis in the index case.

Follow-up of contacts

Cultures for GAS have no role in the identification of asymptomatic close contacts of sporadic cases occurring in the community. The only reason for obtaining cultures for GAS is in the diagnosis of suspected infection. There is no role for routine

culture for a test of cure for contacts receiving antibiotic chemoprophylaxis.

6.3 Long-term care facilities

Residents of LTCF are at increased risk of morbidity and mortality due to invasive GAS disease because of their older age and higher prevalence of underlying conditions[36,41-43]. When a culture-confirmed case of invasive GAS disease occurs in an LTCF, there is a 38% likelihood that a second, positive blood culture-confirmed case of the same strain will be detected in the facility within 6 weeks (Dr. A. McGeer, Mount Sinai Hospital, Toronto: personal communication, July 2005). A number of outbreaks of invasive GAS infections have been documented in LTCF[23,36,42-46]. Infection is often spread through person-to-person contact, with clustering of cases by room or care unit in some instances[23,36,42,43,46]. Staff may be a source of or conduit of infection either through poor infection control practices or asymptomatic carriage[35,42,44,45]. However, hospital staff who are carriers are more likely to be the source of infection in outbreaks in acute care facilities, whereas outbreaks in LTCF are more often patient-propagated[23]. In LTCF outbreaks, the implicated strain is usually widespread within the facility, and limited provision of chemoprophylaxis to close contacts is not the optimal approach.

In addition to strict enforcement of standard infection control practices, the following approach may be useful in the investigation and control of invasive GAS disease in LTCF:

- When a confirmed case of invasive GAS disease (as described in Section 5.1) occurs in an LTCF such as a nursing home, the facility should
  - report the case to the local health authorities;
  - conduct a retrospective chart review of the entire facility's residents over the previous 4 to 6 weeks for culture-confirmed cases of GAS disease and any suggested cases of non-invasive or invasive GAS infection, including skin and soft tissue infections (e.g. pharyngitis and cellulitis) and excluding pneumonia and conjunctivitis not confirmed by culture. An excess of GAS infection, or an LTCF outbreak, is defined in Table 4;
  - assess the potential for a source of infection from outside the facility (e.g. regular visits from children who have recently been ill).
- If an excess of GAS infection is identified, the following actions should be considered:
  - all patient care staff should be screened for GAS with throat, nose and skin lesion cultures. In LTCF with < 100 beds, all residents should be screened for GAS. In LTCF with 100 beds or greater, screening can be limited to all residents within the same care unit as the infected case and contacts of the case if necessary, unless patient and care staff movement patterns or epidemiologic evidence (e.g. from the chart review) suggest that screening should be conducted more broadly;
  - anyone colonized with GAS should receive chemoprophylaxis (see Section 7.0);
  - non-patient care staff should be asked about possible recent GAS infections. Those with a positive history should be screened for GAS, and those who are positive should be treated with antibiotics as per the recommended regimen;
  - all GAS isolates should have further typing (see Annex 2: Laboratory Support for Outbreak Investigation of Invasive GAS, for further details). Culture for a test of cure is recommended for individuals found to have the outbreak-related strain, particularly if there is epidemiologic evidence indicating that contact with the individual is significantly related to illness. Culture for a test of cure is not necessary for individuals infected with a strain of GAS not related to the outbreak.
  - all GAS positive residents and staff should be re-screened, including throat and skin lesion(s), 14 days after chemoprophylaxis has been started; this should be followed by screening at 2 weeks and at 4 weeks after the first re-screening. If the person is found to be positive, a second course of chemoprophylaxis should be offered. If the person is still

colonized after the second course, discontinue chemoprophylaxis unless the facility has an ongoing problem with GAS infection;

- active surveillance for GAS infection should be initiated and continued for 1 to 2 months;
- appropriate specimens should be taken for culture to rule out GAS when suspected infections are detected by active surveillance.

- If no excess is identified, especially if there is evidence of an outside source of infection for the index case, then active surveillance alone for 2 to 4 weeks to establish the absence of additional cases is warranted.

Disease control measures for invasive GAS disease occurring in other health care settings are described in Annex 3.

6.4 Child Care Centres

For the purposes of these guidelines, child care centres include group or institutional child care centres (day care), family or home day care and pre-schools. Non-invasive GAS infection can spread easily in child care centres (CCC)[38]; however, outbreaks of invasive GAS disease occurring among children attending CCC are rare. The recommendations for invasive GAS disease in CCC are therefore based on expert opinion and very limited evidence.

In two CCC outbreaks in the United States, GAS infection or carriage of the same serotype as the index case was detected in 8% to 18% of other attendees. The risk of GAS infection or carriage was associated with sharing a room with the index case and spending a greater number of hours per week at the CCC. GAS prevalence among staff was low in both outbreaks, suggesting that they did not contribute to the spread of infection[37,39].

Invasive GAS disease in children frequently occurs secondary to varicella infection[20,47-52]. Two population-based Canadian studies have shown that 15% to 25% of pediatric cases of invasive GAS disease are associated with antecedent varicella infection[20,50]. The risk is significantly increased during the 2-week period after the onset of varicella infection and may be due to a breakdown in the skin barrier, infection through another less apparent portal, such as lesions on the oral mucosa or the respiratory tract, or immunosuppression[50]. The National Advisory Committee on Immunization (NACI) recommends varicella vaccination for children between 12 and 18 months of age and for susceptible persons ≥ 12 months of age[53]. It has been estimated that the full implementation of universal childhood varicella vaccination could prevent at least 10% of pediatric invasive GAS cases in Canada[50]. Outbreaks of invasive GAS and varicella have been previously reported to occur concurrently among children[37,49,54]. According to NACI guidelines, post-exposure use of varicella vaccine should be considered during an outbreak of varicella in a child care facility[53]. Varicella vaccination of susceptible attendees may help prevent the further spread of a concurrent outbreak of invasive GAS disease[37,49].

In addition to strict enforcement of standard infection control practices[55], staff from the affected CCC must report to local health authorities when a confirmed case of invasive GAS disease (as described in Section 5.1) occurs in a child attending the CCC. This may be required by legislation in some provinces and territories.

Health authorities should investigate when one severe case of invasive GAS disease (see Table 2) occurs in a child attending a CCC. Investigators should take into consideration the following:

1. the nature of the CCC (e.g. type of centre, including the size and physical structure, number and ages of the children, type of interaction of the children);
2. the characteristics of the case (e.g. if the case occurred secondary to a varicella infection);
3. the potential for a source of infection from within the CCC:
    a. whether there has been any suggested non-invasive or invasive GAS infections (e.g. other cases of invasive GAS, pharyngitis, impetigo);

b. potential of a point source of infection (foodborne outbreaks of pharyngitis have occurred and are a consequence of human contamination of food in conjunction with improper preparation or refrigeration procedures[25]);

4. the presence of varicella cases within the CCC in the previous 2 weeks;

5. the potential for a source of infection from outside the CCC (e.g. exposure to a family member with suggested non-invasive or invasive GAS infection).

The following approach should be considered in the investigation and control of invasive GAS disease when one severe case of invasive GAS disease (see Table 2) occurs in a child attending a CCC:

- Parents and/or guardians of attendees should be informed of the situation, alerted to the signs and symptoms of invasive GAS disease and be advised to seek medical attention immediately should their child develop febrile illness or any other clinical manifestations of GAS.
- In family or home day care settings, chemoprophylaxis should be recommended for all children and staff (see Section 7.0).
- In group or institutional CCC and pre-schools, chemoprophylaxis is generally not warranted but may be considered in certain situations, including the occurrence of > 1 case of invasive GAS disease in children or staff of the CCC within 1 month or a concurrent varicella outbreak at the CCC. Cases of invasive GAS occurring among children or staff of a CCC within 1 month should be considered as part of the same cluster. Consideration could be given to testing isolates from invasive GAS cases occurring in a CCC more than 1 month apart, to determine strain relatedness.If a case of varicella has occurred in the CCC within the 2 weeks before onset of GAS symptoms in the index case, all attendees should be assessed for varicella vaccination history. Two weeks was chosen as the time interval on the basis of findings that risk of GAS was significantly increased 2 weeks after onset of varicella infection[50].Varicella vaccination should be recommended for those without a history of prior varicella infection or vaccination as per the NACI guidelines[53].
- A test of cure is not warranted for persons receiving chemoprophylaxis.
- It should be emphasized that staff of the CCC must notify local public health officials if further cases of invasive GAS infection occur. This may be required by legislation in some provinces and territories.
- Appropriate specimens can be taken for culture to rule out GAS when suspected infections are detected during this period; however routine screening of attendees is not recommended.

7.0 Recommendations for Chemoprophylaxis

The objective of chemoprophylaxis is to prevent disease in colonized individuals and in those who have recently been exposed, thereby decreasing transmission of a strain known to cause severe infection.

The recommendations for chemoprophylaxis regimens have been extrapolated from treatment guidelines for acute GAS pharyngitis and evidence from clinical trials for the eradication of pharyngeal GAS colonization. Currently, there are no studies that have specifically assessed the effectiveness of chemoprophylaxis for the prevention of subsequent cases of invasive GAS disease, although antibiotic prophylaxis has been successfully used for outbreak control in LTCF in Canada and the United States[35,36,43,46]. Further studies are needed.

First-generation cephalosporins, such as cephalexin, are the preferred antibiotic for GAS chemoprophylaxis. Second- and third-generation cephalosporins (e.g. cefuroxime axetil, cefixime) may also be considered, but they have a broader spectrum, increased likelihood of resistance and higher cost than first-generation cephalosporins[56,57]. Cephalosporins are more effective than penicillin in eradicating GAS

from pharyngeal carriers[56,58,59]. A meta-analysis of 35 trials involving 7,125 pediatric patients with GAS tonsillopharyngitis showed that the bacteriologic cure rate significantly favoured cephalosporins compared with penicillin (odds ratio [OR] = 3.02, 95% CI: 2.49-3.67) after 10 days of treatment. Eight of 11 individual cephalosporins showed superior bacteriological cure rates among children. The summary OR for clinical cure rate was 2.33 (95% CI: 1.84-2.97)[60]. A meta-analysis of nine randomized controlled trials with adult patients showed that the bacteriologic eradication rate was nearly two times higher for cephalosporins than penicillin for the treatment of acute GAS tonsillopharyngitis after 10 days of treatment (summary OR = 1.83, 95% CI: 1.37-2.44); the clinical cure rate also favoured cephalosporins (summary OR = 2.29, 95% CI: 1.61-3.28)[57]. Cephalosporins are acceptable for penicillin-allergic patients who do not manifest immediate-type hypersensitivity to beta-lactam antibiotics[61].

The macrolides erythromycin and clarithromycin are suitable alternative agents that have been shown to be clinically effective for treatment of GAS pharyngitis[62-67]. However, macrolide resistance is a concern in Canada. According to surveillance data for invasive GAS submitted to NCS, erythromycin resistance has been relatively stable over the past 4 years, ranging from 9.8 to 11.1%[14-16]. In areas where macrolide resistance is either unknown or known to be ≥ 10%, testing of the GAS isolate is recommended to determine appropriate treatment.

Clindamycin is another alternative agent recommended for patients infected with an erythromycin-resistant strain of *S. pyogenes* who are unable to tolerate beta-lactam antibiotics[61]. A 10-day regimen of orally administered clindamycin (20 mg/kg per day) was effective in eradicating GAS from the oropharynx of persistently colonized, asymptomatic children (92%, 24/26) in a randomized, unblinded, controlled clinical trial[68]. Gallegos et al.[69] found that clindamycin regimens of either 150 mg 4 times per day or 300 mg 2 times per day were equally efficacious, with a clinical cure rate of 93% among adults with acute streptococcal tonsillitis/pharyngitis in a double-blind, randomized, multicentre study. However, emergence of resistance would need to be monitored closely for this anti-microbial. In 2004-2005, 2.0% of GAS isolates tested for antimicrobial sensitivity at the NCS were resistant to clindamycin[16], as compared with 1.6% of isolates in 2003-2004[15], 1.9% in 2002-2003 and 0.9% in 2001-2002[14].

Oral penicillin VK (or amoxicillin in young children) may be considered for GAS chemoprophylaxis because of its proven efficacy, safety, narrow spectrum and low cost[70]. However, penicillin is less effective in eradicating GAS from the upper respiratory tracts of chronic (asymptomatic) carriers. Carriers treated with penicillin are generally characterized by a lack of a serologic response and may account for a significant proportion of penicillin treatment failures[58,71-73]. Streptococcal internalization within epithelial cells may contribute to eradication failure and persistent throat carriage[74]. Some experts feel that penicillin should be considered an alternative first-line therapy, whereas other experts believe that penicillin monotherapy may be inferior on the basis of data from bacteriologic eradication in the treatment of GAS pharyngitis and in the eradication of carriage; however, the relevance of these data to chemoprophylaxis of contacts is unclear.

Azithromycin may be considered for the eradication of GAS from the pharynx using a shorter 5-day course[70,75], but Canadian evidence has shown that azithromycin may select for macrolide resistance among streptococci more strongly than erythromycin and clarithromycin, and therefore it should not be considered as a first- or second-line therapy[76].

The chemoprophylactic agents and dosages recommended for preventing disease and decreasing transmission of GAS are listed in Table 6. It is important to ensure that contacts requiring chemoprophylaxis complete the recommended course.

Table 6. Recommended Chemoprophylaxis Regimens for Close Contacts

Drug	Dosage	Comments
First-generation cephalosporins: cephalexin, cephadroxil, cephradine	**First line.** Children and adults: 25 to 50 mg/kg daily, to a maximum of 1 g/day in 2 to 4 divided doses × 10 days	Recommended drug for pregnant and lactating women. Should be used with caution in patients with allergy to penicillin. Use of cephalosporins with nephrotoxic drugs (e.g. aminoglycosides, vancomycin) may increase the risk of cephalosporin-induced nephrotoxicity.
Erythromycin	**Second line.** Children: 5 to 7.5 mg/kg every 6 hours or 10 to 15 mg/kg every 12 hours (base) × 10 days (not to exceed maximum of adult dose) Adults: 500 mg every 12 hours (base) × 10 days	Erythromycin estolate is contraindicated in persons with pre-existing liver disease or dysfunction and during pregnancy. Sensitivity testing is recommended in areas where macrolide resistance is unknown or known to be ≥ 10%.
Clarithromycin	**Second line.** Children: 15 mg/kg daily in divided doses every 12 hours, to a maximum of 250 mg po bid × 10 days Adults: 250 mg po bid × 10 days	Contraindicated in pregnancy. Sensitivity testing is recommended in areas where macrolide resistance is unknown or known to be ≥ 10%.
Clindamycin	**Second line.** Children: 8 to 16 mg/kg daily divided into 3 or 4 equal doses × 10 days (not to exceed maximum of adult dose) Adults: 150 mg every 6 hours × 10 days	Alternative for persons who are unable to tolerate beta-lactam antibiotics.

8.0 Vaccines

Currently, there are no vaccines approved for use in Canada for the prevention of GAS infections. There are a number of vaccines under development. Recent results of a phase I trial of a multivalent vaccine in the United States have demonstrated significant increases in antibody levels to all six component M antigens used in the vaccine among healthy adult volunteers[77]. Results of a phase I trial and preliminary results of a phase II trial for a multivalent vaccine in Canada have also shown high titres of antibodies to 26 targeted serotypes contained in the vaccine among healthy adult volunteers[78,79]. There was no evidence of tissue cross-reactive antibodies or vaccine-related serious adverse events among participants for either vaccine.

9.0 Communications

9.1 Communication pertaining to sporadic cases

In general, it is not necessary to inform the general public of a sporadic case, even if it involves a fatality. However, it is important that a communication strategy be prepared in advance in order to address any questions that may arise among those concerned with the control measures or if approached by the media. Details of the communication strategy need to be tailored to the context of the sporadic case (e.g. liaison with school authorities is important when a case is a student). This could include information on the disease and its characteristics, local epidemiology of GAS and recommended treatment and prophylactic measures.

9.2 Communication pertaining to clusters or outbreaks

It is essential that a communication strategy be in place to provide timely information to the public or local community when a cluster or outbreak occurs. A communication strategy aimed at the health care community should also be developed. This should include the criteria and the process for reporting to public health, timely surveillance reports and updates, guidelines on early diagnosis (including signs and symptoms) and recommended treatment and prophylactic measures. It is important to involve the health care community as early as possible after the recognition of an outbreak. The need for an outbreak advisory committee comprising public health representatives, clinicians and medical laboratory personnel should be evaluated.

In addition to the principles previously described, essential elements of a communication strategy include the following:

1. Wide consultation, including public health representatives, clinicians and laboratory personnel, before any decision is made;
2. Clearly designated responsibilities. A designated lead organization should be identified. Messages should be coordinated and consistent. The lead organization should be responsible for the announcement of the decision and the management of communications with respect to the operation of a control program;
3. Within each organization, one spokesperson should be responsible for communicating with the media.

10.0 Areas for Future Research

These public health guidelines for invasive GAS disease have been formulated through a consensus process involving public health officials, as well as experts in adult and pediatric infectious diseases and microbiology, and are based on limited evidence and expert opinion. Risk of subsequent infection among household contacts has been estimated on the basis of very small numbers of subsequent cases in two studies; further studies are needed to quantify this risk more precisely. Studies should also be performed to assess the risk of subsequent infection among non-household close contacts. Although screening is generally not indicated for investigations of invasive GAS disease in CCC, it may be considered in applied research settings to provide further information on the epidemiology of GAS infections in CCC. There is a need to evaluate the efficacy of chemoprophylaxis of close contacts and the effectiveness of different approaches to prophylaxis. As additional evidence becomes available, these guidelines may need to be revisited.

References

1. Demers B, Simor AE, Vellend H et al. *Severe invasive group A streptococcal infections in Ontario, Canada: 1987-1991.* Clin Infect Dis 1993;16:792-800.
2. Efstratiou A. *Group A streptococci in the 1990s.* J Antimicrob Chemother 2000;45:3-12.
3. Eriksson KG, Andersson J, Holm SE et al. *Epidemiological and clinical aspects of invasive group A streptococcal infections and the streptococcal toxic shock syndrome.* Clin Infect Dis 1998;27:1428-36.
4. Stevens DL. *Invasive group A streptococcal infections: The past, present and future.* Pediatr Infect Dis J 1994;13:561-6.
5. Hoge CW, Schwartz B, Talkington DF et al. *The changing epidemiology of invasive group A streptococcal infections and the emergence of streptococcal toxic shock-like syndrome.* JAMA 1993;269:384-9.
6. Schwartz B, Facklam RR, Breiman RF. *Changing epidemiology of group A streptococcal infection in the USA.* Lancet 1990;336:1167-71.
7. Bisno AL, Stevens DL. *Streptococcus pyogenes (including streptococcal toxic shock syndrome and necrotizing fasciitis).* In: Mandell GL, Bennett JE,

Dolin R, eds. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases*, 5th ed. Philadelphia: Churchill Livingstone, 2000:2101-17.

8. Health Canada. *Notifiable diseases annual summary: 2001*. CCDR 2004;30S3:92-4.

9. *International Circumpolar Surveillance (ICS) summary report: Year 2000 data*. Anchorage: International Circumpolar Surveillance, 2002.

10. *International Circumpolar Surveillance (ICS) summary report: Year 2001 data*. Anchorage: International Circumpolar Surveillance, 2003.

11. *International Circumpolar Surveillance (ICS) summary report: Year 2002 data*. Anchorage: International Circumpolar Surveillance, 2005.

12. *International Circumpolar Surveillance (ICS) preliminary summary report: Year 2003 data*. Anchorage: International Circumpolar Surveillance, 2005.

13. Tyrrell GJ, Lovgren M, Forwick B et al. *M types of group A Streptococcal isolates submitted to the National Centre for Streptococcus (Canada) from 1993 to 1999.* J Clin Microbiol 2002;40:4466-71.

14. *Annual report for April 1, 2002 to March 31, 2003*. Edmonton: National Centre for Streptococcus, 2003.

15. *Annual report for April 1, 2003 to March 31, 2004*. Edmonton: National Centre for Streptococcus, 2004.

16. *Annual report for April 1, 2004 to March 31, 2005*. Edmonton: National Centre for Streptococcus, 2005.

17. Davies HD, McGeer A, Schwartz B et al. *Invasive group A streptococcal infections in Ontario, Canada.* N Engl J Med 1996;335:547-54.

18. Sharkawy A, Low DE, Saginur R et al. *Severe group A streptococcal soft-tissue infections in Ontario: 1992-1996.* Clin Infect Dis 2002;34:454-60.

19. Muller MP, Low DE, Green KA et al. *Clinical and epidemiologic features of group A streptococcal pneumonia in Ontario, Canada.* Arch Intern Med 2003;163:467-72.

20. Tyrrell GJ, Lovgren M, Kress B et al. *Invasive group A streptococcal disease in Alberta, Canada (2000 to 2002).* J Clin Microbiol 2005;43:1678-83.

21. Health Canada. *Case definitions for diseases under national surveillance.* CCDR 2000;26S3:1-134.

22. Robinson KA, Rothrock G, Phan Q et al. *Risk for severe group A streptococcal disease among patients' household contacts.* Emerg Infect Dis 2003;9:443-7.

23. Schwartz B, Elliott JA, Butler JC et al. *Clusters of invasive group A streptococcal infections in family, hospital, and nursing home settings.* Clin Infect Dis 1992;15:277-84.

24. Davies HD. *Invasive group A streptococcal infections: Canadian Pediatric Society Position Statement*. Pediatr Child Health 1999;4:73-5. URL: <http://www.cps.ca/english/statements/ID/id98-05.htm>.

25. American Academy of Pediatrics. *Red book: 2003 report of the Committee on Infectious Diseases*, 26th ed. Elk Grove Village, IL: American Academy of Pediatrics, 2003.

26. *Guidelines for the treatment of necrotizing fasciitis (NF) and Streptococcal toxic shock syndrome (STSS)*. Toronto: Ontario Group A Streptococcal Study, 1998. URL: <http://microbiology.mtsinai.on.ca/protocols/pdf/k5a.pdf>.

27. Prevention of Invasive Group A Streptococcal Infections Working Group. *Prevention of invasive group A streptococcal disease among household contacts of case patients and among postpartum and postsurgical patients: Recommendations from the Centers for Disease Control and Prevention.* Clin Infect Dis 2002;35:950-9.

28. Health Protection Agency, Group A Streptococcus Working Group. *Interim UK guidelines for management of close community contacts of invasive group A streptococcal disease.* Commun Dis Public Health 2004;7:354-61.

29. Valenzuela TD, Hooton TM, Kaplan EL et al. *Transmission of toxic strep syndrome from an infected child to a firefighter during CPR.* Annals Emerg Med 1991;20:90-2.

30. Bohlen LM, Muhlemann K, Dubuis O et al. *Outbreak among drug users caused by a clonal strain of group A streptococcus.* Emerg Infect Dis 2000;6:175-9.

31. Lechot P, Schaad HJ, Graf S et al. *Group A streptococcus clones causing reported epidemics and endemic disease in intravenous drug users.* Scand J Infect Dis 2001;33:41-6.

32. Brunner S, Fleisch F, Ruef C et al. *Automated ribotyping and pulsed-field gel electrophoresis reveal a cluster of group A streptococci in intravenous drug abusers.* Infection 2000;28:314-7.

33. Smolyakov R, Riesenberg K, Schlaeffer F et al. *Streptococcal septic arthritis and necrotizing fasciitis in an intravenous drug user couple sharing needles.* Isr Med Assoc J 2002;4:302-3.

34. Weiss K, Laverdiere M, Lovgren M et al. *Group A Streptococcus carriage among close contacts of patients with invasive infections.* Am J Epidemiol 1999;149:863-8.

35. Smith A, Li A, Tolomeo O et al. *Mass antibiotic treatment for group A streptococcus outbreaks in two long-term care facilities.* Emerg Infect Dis 2003;9:1260-5.

36. Hansen JL, Paulissen JP, Larson AL et al. *Nursing home outbreaks of invasive group A streptococcal infections – Illinois, Kansas, North Carolina and Texas.* MMWR 1990;39:577-9.

37. Barry MA, Matthew K, Tormey P et al. *Outbreak of invasive group A streptococcus associated with varicella in a childcare center - Boston, Massachusetts, 1997.* MMWR 2004;46:944-8.

38. Falck G, Kjellander J. *Outbreak of group A streptococcal infection in a day-care center.* Pediatr Infect Dis J 1992;11:914-9.

39. Engelgau MM, Woernle CH, Schwartz B et al. *Invasive group A streptococcus carriage in a child care centre after a fatal case.* Arch Dis Child 1994;71:318-22.

40. Husain E, Bigham M, Davies D et al. *Invasive group A streptococcus in two siblings: A case for antibiotic prophylaxis of close contacts.* CCDR 2001;27:141-6.

41. Ruben FL, Norden CW, Heisler B et al. *An outbreak of **Streptococcus pyogenes** infections in a nursing home.* Ann Intern Med 1984;101:494-6.

42. Harkness GA, Bentley DW, Mottley M et al. ***Streptococcus pyogenes** outbreak in a long-term care facility*. Am J Infect Control 1992;20:142-8.

43. Auerbach SB, Schwartz B, Williams D et al. *Outbreak of invasive group A streptococcal infections in a nursing home. Lessons on prevention and control.* Arch Intern Med 1992;152:1017-22.

44. Reid RI, Briggs RS, Seal DV et al. *Virulent **Streptococcus pyogenes**: Outbreak and spread within a geriatric unit.* J Infect 1983;6:219-25.

45. Barnham M, Hunter S, Hanratty B et al. *Invasive M-type 3 **Streptococcus pyogenes** affecting a family and a residential home.* Commun Dis Public Health 2001;4:64-7.

46. Greene CM, Van Beneden CA, Javadi M et al. *Cluster of deaths from group A streptococcus in a long-term care facility – Georgia, 2001.* Am J Infect Control 2005;33:108-13.

47. Brogan TV, Nizet V, Waldhausen JH et al. *Group A streptococcal necrotizing fasciitis complicating primary varicella: A series of fourteen patients.* Pediatr Infect Dis J 1995;14:588-94.

48. Wilson GJ, Talkington DF, Gruber W et al. *Group A streptococcal necrotizing fasciitis following varicella in children: Case reports and review.* Clin Infect Dis 1995;20:1333-8.

49. Galanis E, Skotniski E, Panaro L et al. *Investigation of a varicella outbreak complicated by group A streptococcus in First Nations Communities, Sioux Lookout Zone, Ontario.* CCDR 2002;28:157-63.

50. Laupland KB, Davies HD, Low DE et al. *Invasive group A streptococcal disease in children and association with varicella-zoster virus infection.* Pediatrics 2000;105:e60-e67.

51. Hollm-Delgado M-G, Allard R, Pillon PA. *Invasive group A streptococcal infections, clinical manifestations and their predictors, Montreal, 1995-2001.* Emerg Infect Dis 2005;11:77-82.

52. Tyrell GJ, Lovgren M, Kress B et al. *Varicella-associated invasive group A streptococcal disease in Alberta, Canada – 2000-2002.* Clin Infect Dis 2005;40:1055-7.

53. National Advisory Committee on Immunization (NACI). *Update on varicella.* CCDR 2004;30(ACS-1):1-27.

54. Peterson CL, Vugia DJ, Meyers HB et al. *Risk factors for invasive group A streptococcal infections in children with varicella: A case-control study.* Pediatr Infect Dis J 1996;15:151-6.

55. *Well being: A guide to promote the physical health, safety and emotional well-being of children in child care centres and family day care homes.* Ottawa: Canadian Pediatric Society, 1996.

56. Shulman ST, Gerber MA. *So what's wrong with penicillin for strep throat?* Pediatrics 2004;113:1816-9.

57. Casey JR, Pichichero ME. *Meta-analysis of cephalosporins versus penicillin for treatment of group A streptococcal tonsillopharyngitis in adults.* Clin Infect Dis 2004;38:1526-34.

58. Gerber MA, Tanz RR, Kabat W et al. *Potential mechanisms for failure to eradicate group A streptococci from the pharynx.* Pediatrics 1999;104:911-7.

59. Bisno AL. *Are cephalosporins superior to penicillin for treatment of acute streptococcal pharyngitis?* Clin Infect Dis 2004;38:1535-7.

60. Casey JR, Pichichero ME. *Meta-analysis of cephalosporins versus penicillin for treatment of group A streptococcal tonsillopharyngitis in children.* Pediatrics 2004;113:866-82.

61. Bisno AL, Gerber MA, Gwaltney JM et al. *Practice guidelines for the diagnosis and management of group A streptococcal pharyngitis.* Clin Infect Dis 2002;35:113-25.

62. Canadian Pediatric Society. *Treatment of group A streptococcal pharyngitis.* Can J Infect Dis 1997;8:17-8.

63. Syrogiannopoulos GA, Bozdogan B, Grivea IN et al. *Two dosages of clarithromycin for five days, amoxicillin/clavulanate for five days or penicillin V for ten days in acute group A streptococcal tonsillopharyngitis.* Pediatr Infect Dis J 2004;23:857-65.

64. Kafetzis DA, Liapi G, Tsolia M et al. *Failure to eradicate group A beta-haemolytic streptococci (GABHS) from the upper respiratory tract after antibiotic treatment.* Int J Antimicrob Agents 2004;23:67-71.

65. Takker U, Dzyublyk O, Busman T et al. *Comparison of 5 days of extended-release clarithromycin versus 10 days of penicillin V for the treatment of streptococcal pharyngitis/ tonsillitis: Results of a multicenter, double-blind, randomized study in adolescent and adult patients.* Curr Med Res Opin 2003;19:421-9.

66. Portier H, Filipecki J, Weber P et al. *Five day clarithromycin modified release versus 10 day penicillin V for group A streptococcal pharyngitis: A multi-centre, open-label, randomized study.* J Antimicrob Chemother 2002;49:337-44.

67. McCarty J, Hedrick JA, Gooch WM. *Clarithromycin suspension vs penicillin V suspension in children with streptococcal pharyngitis.* Adv Ther 2000;17:14-26.

68. Tanz RR, Poncher JR, Corydon KE et al. *Clindamycin treatment of chronic pharyngeal carriage of group A streptococci.* J Pediatr 1991;119:123-8.

69. Gallegos B, Rios A, Espidel A et al. *A double-blind, multicenter comparative study of two regimens of clindamycin hydrochloride in the treatment of patients with acute streptococcal tonsillitis/pharyngitis.* Clin Ther 1995;17:613-21.

70. Schaad UB. *Acute streptococcal tonsillopharyngitis: a review of clinical efficacy and bacteriological eradication.* J Int Med Res 2004;32:1-13.

71. Kaplan EL, Johnson DR. *Unexplained reduced microbiological efficacy of intramuscular benzathine penicillin G and of oral penicillin V in eradication of group A streptococci from children with acute pharyngitis.* Pediatrics 2001;108:1180-6.

72. Kuhn SM, Preiksaitis J, Tyrell GJ et al. *Evaluation of potential factors contributing to microbiological treatment failure in Streptococcus pyogenes pharyngitis.* Can J Infect Dis 2001;12:33-9.

73. Kaplan EL, Gastanaduy AS, Huwe BB. *The role of the carrier in treatment failures after antibiotic for group A streptococci in the upper respiratory tract.* J Lab Clin Med 1981;98:326-35.

74. Sela S, Neeman R, Keller N et al. *Relationship between asymptomatic carriage of Streptococcus pyogenes and the ability of the strains to adhere to and be internalised by cultured epithelial cells.* J Med Microbiol 2000;49:499-502.

75. Cohen R. *Defining the optimum treatment regimen for azithromycin in acute tonsillopharyngitis.* Pediatr Infect Dis J 2004;23:S129-S134.

76. Vanderkooi OG, Low DE, Green K et al. *Predicting antimicrobial resistance in invasive pneumococcal infections.* Clin Infect Dis 2005;40:1288-97.

77. Kotloff KL, Corretti M, Palmer K et al. *Safety and immunogenicity of a recombinant multivalent group A streptococcal vaccine in healthy adults: Phase 1 trial.* JAMA 2004;292:709-15.

78. McNeil SA, Halperin SA, Langley JM et al. *Safety and immunogenicity of 26-valent group A Streptococcus vaccine in healthy adult volunteers.* Clin Infect Dis 2005;41:1114-22.

79. *ID Biomedical announces positive results from phase II clinical trial of Streptavax vaccine.* ID Biomedical Corporation, press release, August 10, 2004.

ANNEX 1

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ANNEX 2

Laboratory Support for Outbreak Investigation of Invasive Group A Streptococcal Disease

The National Centre for Streptococcus (NCS) provides laboratory support for the investigation of clusters or outbreaks of invasive group A Streptococcus (GAS) disease. The decision to initiate this type of investigation rests with the local public health agencies. The investigation team should coordinate the shipment of isolates and required information to the NCS through its local provincial laboratory or designate laboratory. The local outbreak investigation team is asked to provide a brief written description of the event, and this should be forwarded, via the appropriate provincial laboratory or designated laboratory, to the NCS **in advance** of isolate submission. This facilitates a timely laboratory response. Isolates associated with outbreak investigation are given priority testing status, and reports are phoned or faxed to the submitters as soon as testing is complete. Preliminary results for isolates from an outbreak investigation should be available within 1 week.

Contact the NCS at:
Phone: (780) 407-8977; (780) 407-8937
Fax: (780) 407-8984
Email: m.lovgren@provlab.ab.ca; g.tyrrell@provlab.ab.ca

If the investigation is to include testing of contacts (i.e. characterization of non-invasive GAS isolates), arrangements for the primary culture of these specimens should be made through the local microbiology laboratories and/or the provincial laboratories. Isolates may then be forwarded to the NCS for further investigation. Submitters are encouraged to use the NCS submission form for all isolates. This document is available through the NCS Web site at www.provlab.ab.ca (Partners\National Centres\National Centre for Streptococcus\NCS Requisition Forms).

Characterization of *Streptococcus pyogenes* (GAS)

The analysis of GAS includes serologic and molecular techniques. The strain profile includes the identification of the M protein type and T protein, and anti-opacity factor testing for serum opacity factor-positive strains.

M typing

M protein is a significant virulence factor produced by GAS. It is a surface protein antigen that gives the organism the ability to resist phagocytosis as a way of evading the human immune response to infection. Traditional serologic characterization of M protein relies on an antigen-antibody reaction between the organism and M type specific antisera. The M antisera are inherently difficult to prepare (commercial reagents are not available), and consequently this specialized testing is offered in only six reference laboratories worldwide. There are 86 M protein types that have been officially classified by this serologic method. The testing is performed by immunodiffusion and, especially for less common M types, several steps may be required to classify the strain. The production of M protein is coded by the *emm* gene, and molecular analysis is able to classify a rapidly expanding number of *emm* types. The *emm* type corresponds to the M type (e.g. M1 = *emm* 1) when the strain belongs to one of the internationally recognized M types. However *emm* typing is able to classify a large number of strains for which traditional M antisera are not available. This makes *emm* typing a more specific tool.

T typing

T protein is not a virulence factor, but it provides an additional serologic "marker" with which to differentiate strains. A GAS strain may carry one or more T antigens, and the same T pattern may be shared by several M or *emm* types. T typing is therefore a less specific typing method than M or *emm* typing; however, there is an association between the T pattern and the specific M or *emm* type. T typing is performed by observing the antigen-antibody reaction with specific T typing antisera.

SOF typing

Serum opacity factor (SOF) is an enzyme that is produced by some M/*emm* types. It is an apoproteinase that is named for its ability to produce opacity when an extract of the strain is mixed with mammalian serum (horse serum is typically used). Some M types are known to be SOF positive and others are typically SOF negative (e.g. M1 is always SOF negative, and M22 is typically SOF positive). The opacity factor of SOF-positive strains may be typed by neutralization of the reaction using specific antisera. This is called anti-opacity factor (AOF) typing and, with few exceptions, the AOF type is consistent with the M/*emm* type.

sic gene typing of M1 strains

Traditional fingerprinting techniques (e.g. pulsed field gel electrophoresis) are not specific enough to differentiate strains of the same M/*emm* type. However, for M1/*emm* 1 strains, which account for 20% to 30% of the invasive disease-causing strains each year in Canada, variation within the *sic* (streptococcal inhibitor of complement) gene may be used to provide further analysis of isolates associated with an outbreak. Utilization of this testing for specific investigations must be discussed with the NCS before isolates are sent.

Writers: Marguerite Lovgren and Gregory J. Tyrrell

Selected Readings

1. Beall B, Gherardi G, Lovgren M et al. ***emm*** *and* ***sof*** *gene sequence variation in relation to serological typing of opacity-factor positive group A streptococci.* Microbiology 2000;146:1195-209.

2. Beall B, Facklam RR, Elliott JA et al. *Streptococcal* ***emm*** *types associated with T-agglutination types and the use of conserved* ***emm*** *gene restriction fragment patterns for subtyping of group A streptococci.* J Med Microbiol 1998;47:893-8.

3. Facklam RF, Martin DR, Lovgren M et al. *Extension of the Lancefield classification for group A streptococci by addition of 22 new M protein gene sequence types for clinical isolates:* ***emm*** *103 to* ***emm*** *124.* Clin Infect Dis 2002;43:28-38.

4. Facklam R, Beall B, Efstratiou et al. ***emm*** *typing and validation of provisional M types for group A streptococci.* Emerg Infect Dis 1999;5:247-53.

5. Tyrrell GJ, Lovgren M, Forwick B et al. *M types of group A streptococcal isolates submitted to the National Centre for Streptococcus (Canada) from 1993-1999.* J Clin Microbiol 2002;40:4466-71.

ANNEX 3

Infection Control for Invasive Group A Streptococcus Infection in Hospitals

This document was developed for the use of health care workers (HCWs) to prevent the transmission of invasive group A streptococcus (GAS) in hospitals. Invasive GAS disease is defined as disease with isolation of GAS from a normally sterile site (Section 5.1 of these Guidelines). For recommendations on non-invasive GAS please refer to the Public Health Agency of Canada (PHAC) Infection Control Guideline: *Routine Practices and Additional Precautions for Preventing the Transmission of Infections in Health Care – Revision of Isolation and Precaution Techniques*[1].

The recommendations in this document are based on PHAC infection control guidelines: *Routine Practices and Additional Precautions for Preventing the Transmission of Infections in Health Care – Revision of Isolation and Precaution Techniques*[1], *Prevention and Control of Occupational Infections in Health Care*[2] and *Hand Washing, Cleaning, Disinfection and Sterilization in Health Care*[3].

Some specific recommendations in this Annex may supersede existing PHAC infection control guidelines; they are based on new evidence, expert opinion and consensus. The recommendations in this Annex have been reviewed and endorsed by the PHAC Infection Control Guidelines Steering Committee. A glossary of terms is found at the end of the Annex.

Transmission of Invasive GAS in Health Care Settings

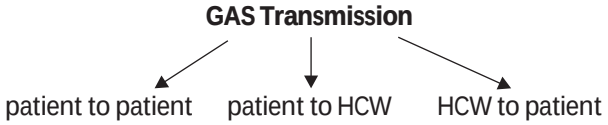
GAS is primarily spread by large droplet contact of the oral or nasal mucous membranes with infectious respiratory secretions or with exudates from wounds or skin lesions, or by direct or indirect contact of non-intact skin with exudates from skin or wounds or infectious respiratory secretions[1]. Transmission between patients through contaminated hands and the reduction of transmission by handwashing was initially reported by Semmelweiss in 1848[4]. Transmission by contaminated equipment or patient care products (e.g. bidets, multi-dose injection vials) has rarely been reported[5].

The incubation period for invasive GAS infection has not been determined. The incubation period for non-invasive GAS infection varies according to the clinical syndrome, usually 1 to 3 days. The infection is communicable until 24 hours of effective antibiotic treatment has been completed.

Nosocomial infections accounted for 12% of all invasive GAS infections identified during prospective surveillance in Ontario from 1992 to 2000[6]. Although pre-existing GAS carriage by the patient may play a role in some cases of sporadic post-partum or postoperative infections, GAS may also be acquired from health care providers with symptomatic infection or asymptomatic carriage[5-8]. Hospital outbreaks of invasive GAS have been reported in a variety of patient groups (e.g. post-partum women and newborns, postoperative surgical patients, burn patients, neonatal intensive care patients, patients in geriatric wards)[5,8]. Some outbreaks have been associated with persistent carriage of GAS by asymptomatic health care providers (e.g. surgeons, obstetricians, anesthesiologists, nurses). The pharynx, vagina, rectum and/or specific areas of skin (e.g. scalp) have been sites of colonization[5,8,9]. Outbreaks of GAS infection have also occurred in exposed HCWs[5,10].

Infection Control Measures To Prevent Transmission of Invasive GAS in Health Care Institutions

The transmission of invasive GAS in hospitals and long-term care facilities is most effectively prevented by adherence to good hand hygiene and other routine practices at all times. In addition, for patients with invasive GAS infection, contact and droplet precautions are required until 24 hours of effective antibiotic therapy has been administered. As most cases of nosocomial invasive GAS are sporadic, it is important to recognize clinical presentations compatible with invasive GAS early and institute additional precautions while awaiting laboratory confirmation. Active surveillance for early identification of outbreaks may also be effective in preventing some cases. Prevention of a hospital outbreak of GAS infection requires very rapid investigation and intervention once a single hospital-acquired case has been identified[6,8]. For further information regarding infection control measures in long-term care facilities please see Section 6.3 of the Guidelines.



In order to effectively prevent the transmission of GAS from patient to patient, patient to HCW and/or HCW to patient, the following infection control practices are necessary:

- Consistent adherence to good hand hygiene practice.
- Use of routine practices at all times and for all patients, including wearing a surgical/procedure mask and eye protection or face shield when contamination of the mucous membranes is likely, for example when doing wound irrigation.
- In addition to routine practices at all times, applying contact and droplet precautions when caring for patients with known or suspected invasive GAS disease (Section 5.1 of the Guidelines) until 24 hours of effective antimicrobial therapy is complete. For the purpose of infection control, GAS pneumonia with or without a positive blood culture is considered an invasive infection, although not identified as such for reporting.
- Ensuring that HCWs promptly report illness possibly due to GAS (pharyngitis, impetigo, wound or skin infections, cellulitis) and comply with policies regarding not working when ill with a potentially communicable disease.
- Investigating clusters and identifying and treating patients and staff members with symptomatic GAS infection.
- Patients who share a room with a patient with invasive GAS are not considered as exposed and do not require prophylaxis. Unusual circumstances, e.g. the roommate has had direct mucous or non-intact skin contact with infectious respiratory tract secretions or skin lesions of an infected patient, should be assessed on a case-by-case basis.

Occupational Health Work Practices to Manage HCWs Exposed/Colonized/ Infected with GAS (invasive or non-invasive infection)

Management of HCWs exposed to GAS

- An occupational exposure of a HCW is defined as secretions from the nose, mouth, wound or skin infection of the infected case coming into contact with the mucous membranes or non-intact skin of the HCW from within 7 days before the onset of GAS until 24 hours of effective antibiotic therapy.
- If appropriate personal protective equipment was worn, there was no exposure.
- The risk of development of GAS infection in exposed HCWs and the utility and efficacy of prophylaxis for this group are unknown. HCWs who have an occupational exposure to a patient with GAS soft tissue necrosis (including necrotizing fasciitis, myositis or gangrene), toxic shock syndrome, meningitis, pneumonia, other

life threatening GAS disease or GAS disease resulting in death may be offered chemoprophylaxis (Tables 3 and 5 of the Guidelines). In this situation, screening and/or cultures for test of cure are not necessary. This recommendation differs slightly from current guidelines defined in Prevention and Control of Occupational Infections in Health Care[2], which indicates that management may include laboratory investigation and prophylaxis as recommended by provincial/territorial guidelines. HCWs with an occupational exposure should be counselled about the symptoms associated with GAS and advised to seek care immediately if symptoms of GAS disease (skin infection, pharyngitis, unexplained fever) develop in the 21 days after exposure.

- An occupational exposure to a patient with a form of invasive GAS not listed above is not considered to pose a significant risk of serious disease in HCWs; if workers report a significant exposure to such patients, they should be counselled about the symptoms associated with GAS and advised to seek care immediately if symptoms of GAS disease (skin infection, pharyngitis, unexplained fever) develop in the 21 days after exposure.
- There are no modifications to work practices or work restrictions for HCWs exposed to GAS.
- No screening, treatment, modifications of work practices or work restrictions for HCWs in contact with a patient with a GAS infection are required when there has not been an occupational exposure.

Management of HCWs colonized or infected with GAS

- There are no modifications to work practices or work restrictions for HCWs who are colonized with GAS and are asymptomatic if they are not epidemiologically linked to patient transmission.
- Asymptomatic, colonized HCWs who are epidemiologically linked to transmission of GAS to patients resulting in invasive or non-invasive disease should be offered chemoprophylaxis (Table 6 of the Guidelines) and should be excluded from patient care duties until 24 hours after the start of treatment with effective antibiotic therapy.
- HCWs with symptomatic GAS infection (invasive or non-invasive) should be offered therapy and should be excluded from patient care duties until 24 hours after the start of effective antibiotic therapy.
- HCWs with symptomatic GAS infection and colonized HCWs linked epidemiologically to an outbreak should be informed of the potential for transmission of GAS within households and be advised that symptomatic family members should seek medical evaluation.
- Local public health authorities should be notified of cases of invasive GAS disease or a suspected or confirmed outbreak of GAS as required by legislation.
- Infection control and occupational health should be notified immediately of a HCW with suspected or confirmed GAS disease (invasive or non-invasive) if the HCW worked while the infection was communicable or if there is any possibility that the infection might have been occupationally acquired.
- Occupationally acquired infections should be reported to provincial/territorial ministries of labour and/or workplace safety insurance boards, as required by legislation.

Management of possible or confirmed GAS outbreaks in hospitals

- If, within 1 month of an invasive GAS case, one or more possibly linked additional invasive or non-invasive cases occur in either patients or staff, the situation should be treated as an outbreak until typing results are available.
- Occupational Health, Infection Prevention and Control, and Public Health authorities should be notified and liaise if an outbreak is suspected or confirmed.
- As part of the outbreak investigation, specimens for culture (throat, rectal, vaginal, skin lesions, stoma sites) should be obtained from HCWs and

patients epidemiologically linked to the nosocomial GAS transmission. A thorough inspection of the skin should be done for HCWs who are epidemiologically linked to nosocomial GAS transmission and culture of lesion carried out as appropriate (there have been outbreaks associated with skin/scalp carriage)[5].

- Patients and HCWs epidemiologically linked to transmission and identified as colonized by screening cultures should be promptly offered antibiotics to eradicate carriage (Table 6 of the Guidelines)[2,3]. Isolates should be obtained and typed (serotyping or another equivalent method) to identify relatedness (see Annex 2: Laboratory Support for Outbreak Investigation of Invasive GAS Disease).
- HCWs who are either colonized, symptomatic or infected with GAS and epidemiologically linked to transmission should be excluded from patient care duties until 24 hours after the start of effective antibiotic therapy and assessed for fitness to work. The type of patient/physical setting/work/hygiene practices and control measures that can be used should be assessed, and a follow-up schedule established[2,3].
- Culture for a test of cure is recommended for individuals found to have the outbreak-related strain if there is epidemiologic evidence indicating that contact with the individual is linked to transmission. If the person remains colonized, investigation of the household contacts for carriage should be considered.
- HCWs and/or patients who are identified by outbreak investigations and whose isolates are identified by typing as not being part of the outbreak do not require any follow-up or test of cure cultures.
- For algorithms in cases of post-partum and post-surgical GAS disease, please refer to guidelines from the Centers for Disease Control and Prevention[8].

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Glossary of Terms

Additional precautions: These precautions are required when routine practices are not sufficient to prevent transmission. They include contact, droplet and airborne precautions.

Contact precautions: Includes specific recommendations for personal protective equipment (such as gowns if clothing or forearms will have direct contact with the patient or contaminated environmental surfaces, and gloves upon entry into patient's room or bed space); proper use and disinfection of patient care equipment between patients; patient accommodation and transport.

Contact transmission: Includes direct contact, indirect contact and droplet (large droplet) transmission as described below. Although droplet transmission is a type of contact transmission, it is considered separately as it requires different precautions.

- **Direct contact** occurs when the transfer of microorganisms results from direct physical contact between an infected or colonized individual and a susceptible host (body surface to body surface).
- **Indirect contact** involves the passive transfer of microorganisms to a susceptible host via an intermediate object such as contaminated hands that are not washed between patients, contaminated instruments or other inanimate objects.

Droplet precautions: Includes specific recommendations for personal protective equipment (including masks within 1 metre of the patient); patient accommodation and transport.

Droplet transmission: Refers to large droplets, greater than or equal to 5 μm in diameter, generated from the respiratory tract of the source patient during coughing or sneezing, or during procedures such as suctioning or bronchoscopy. These droplets are propelled a short distance, < 1 metre, through the air and deposited on the nasal or oral mucosa of the new host.

Exposed HCW: To be considered an exposed HCW, secretions from the nose, mouth, skin lesions or wound of the infected case have to come in contact with the mucous membranes or non-intact skin of the HCW.

Hand hygiene: A general term that applies either to handwashing, an antiseptic handwash, an antiseptic hand rub, or a surgical hand antisepsis.

Mask: A barrier covering the nose and mouth to protect the mucous membranes from splashes or sprays and from microorganisms contained in large droplet particles (> 5 μm in size). Masks may also be used by the source patient to contain large droplet particles generated by coughing or sneezing. The term mask in this document refers to surgical/procedure masks, not to special masks such as high efficiency dust/mist masks or respirators.

Nosocomial infection: An infection is considered nosocomial or hospital-acquired if the disease was neither present nor incubating at the time of hospital admission.

Routine practices: Routine practices are infection prevention and control practices for use in the routine care of all patients and are dependent on the task being performed and the health care setting. Routine practices outline the importance of handwashing before and after caring for patients; the need to use gloves, masks and eye protection or face shield, and gowns when splashes or sprays of blood, body fluids, secretions or excretions are possible; the cleaning of patient care equipment; the patient's physical environment; accommodation requirements for specific patients; management of soiled linens; and precautions to reduce the possibility of HCW exposure to bloodborne pathogens by sharp objects.

References

1. Health Canada. *Routine practices and additional precautions for preventing the transmission of infections in health care – Revision of isolation and precaution techniques.* CCDR 1999;25S4:1-142. URL: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/99vol25/25s4/index.html>.
2. Health Canada. *Prevention and control of occupational infections in health care.* CCDR 2002;28S1:1-264. URL: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/02vol28/28s1/index.html>.
3. Health Canada. *Hand washing, cleaning, disinfection and sterilization in health care.* CCDR 1998;24S8:1-55. URL: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/98pdf/cdr24s8e.pdf>.
4. *Historical vignette: The first report on Semmelweis' discovery of the cause and prevention of childbed fever.* Infect Control 1982;3:478-9.
5. Weber DJ, Rutala WA, Denny FW. *Management of healthcare workers with pharyngitis or suspected streptococcal infections.* Infect Control Hosp Epidemiol 1996;17:753-61.
6. Daneman N, McGeer A, Low DE et al. *Hospital-acquired invasive group A streptococcal infections in Ontario, Canada, 1992-2000.* Clin Infect Dis 2005;41:334-42.
7. Stefonek KR, Maerz LL, NielsonMP et al. *Group A streptococcal puerperal sepsis preceded by positive surveillance cultures.* Obstet Gynecol 2001;98:846-8.
8. Prevention of Invasive Group A Streptococcal Infections Working Group. *Prevention of invasive group A streptococcal disease among household contacts of case patients and among postpartum and postsurgical patients: recommendations from the Centers for Disease Control and Prevention.* Clin Infect Dis 2002;35:950-9.
9. Centers for Disease Control and Prevention. *Nosocomial group A streptococcal infections associated with asymptomatic health-care workers – Maryland and California, 1997.* MMWR 1999;48:163-6.
10. Kakis A, Gibbs L, Eguia J et al. *An outbreak of group A streptococcal infection among health care workers.* Clin Infect Dis 2002;35:1353-9.

9.3.1 Invasive Meningococcal Disease (IMD)

Special Precautions/Considerations

Precautions: Droplet

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	*Neisseria meningitidis* (*N. meningitidis*), also called meningococcus, is a gram-negative aerobic diplococcus with at least 13 serogroups. Strains belonging to groups A, B, C, Y and W-135 are most commonly implicated in invasive disease.
Clinical	
Clinical Presentation	Sudden onset of fever, intense headache, nausea and often vomiting, stiff neck and photophobia. In infants and young children, symptoms may also include irritability, poor feeding and drowsiness. Meningococcemia, or meningococcal sepsis, is the most severe form of infection with petechial rash, hypotension, disseminated intravascular coagulation and multi-organ failure. Other clinical manifestations may include orbital cellulitis, septic arthritis, pericarditis or pneumonia with bacteremia.
Diagnostics	Laboratory Criteria for Diagnosis requires the isolation of *N. meningitidis* by culture from a normally sterile site (e.g. blood or cerebrospinal fluid or, less commonly, joint, pleural or pericardial fluid). Confusion sometimes arises in determining whether a swab or aspirate is sterile or superficial (i.e. not from a sterile site). Generally the only swabs which are from sterile sites are those which are taken in the operating room during surgery – if this is not the case, it is unlikely that the isolate is from a sterile site. Aspirates are usually from sterile sites; an aspirate culture can be obtained through needle aspiration or during a percutaneous drainage procedure. It is essential to note that **only invasive disease is reportable**. Isolation of *N. meningitidis* from eye swab or sputum should also be reported. Although they are not reportable, from a case management perspective, the management of contacts of cases with conjunctivitis or pneumonia is the same as for contacts of invasive cases (refer to Contact Management section). Follow your regional laboratory procedures for serologic testing.
Treatment	A discussion of the treatment of Invasive Meningococcal Disease (IMD) is beyond the scope of these guidelines. The case should be referred to an expert for further management.
Pathogen	
Occurrence	**Worldwide:** Endemic meningococcal disease occurs with an estimated 500,000 cases each year. The greatest incidence is during winter and spring. Epidemics are irregular. Disease occurs commonly in children and young adults, more males than females, and more commonly, among newly aggregated adults under crowded living conditions. **Canada:** IMD is endemic with periods of increased activity that occur about every 10 to 15 years, with no consistent pattern. The incidence of IMD varies

	with different serogroups, age groups, locations and time. From 2002 to 2008 the rate of IMD in Canada has remained fairly steady at an average of 0.6 cases per 100,000 population. **Nunavut:** From 1999-2011 there have been under 5 cases of IMD per year, for this time frame there has been a yearly average of 1.3 cases per 100,000. Cases generally occur in children (under 3 years) and are subtype B; there is no consistent pattern by geographic region.
Reservoir	Humans. Up to 5–10% of people may be asymptomatic carriers with nasopharyngeal colonization of *N. meningitidis.* Less than 1% of those colonized will progress to invasive disease.
Transmission	Person-to-person by direct contact with saliva or respiratory secretions. The likelihood of person-to-person transmission is related to the nature and duration of contact; close and prolonged contact, such as kissing, sneezing and sharing eating/drinking utensils facilitates the spread of disease.
Incubation Period	Usually 3 to 4 days, ranges from 2 to 10 days.
Communicability	Communicable from 7 days before the onset of symptoms to 24 hours after the initiation of appropriate antibiotic therapy. The period of communicability is difficult to determine in asymptomatic carriers.
Susceptibility and Resistance	Susceptibility to clinical disease is low and decreases with age, which induces a high ratio of carriers to cases. Persons who are deficient in certain complement components are especially prone to recurrent disease. Asplenics and individuals who have received cochlear implants are susceptible to bacteremic illness. Group-specific immunity of unknown duration follows even in sub-clinical infections. People living in the same household as an IMD case are at 500 to1200-fold greater risk of developing IMD than the general population. The risk of secondary disease among close contacts is highest during the first few days after the onset of disease in the index case.
Public Health Management	
Case	Contact and interview the case. If the case is too ill to be interviewed, information should be obtained from family, health care providers, etc. Close contacts may be at increased risk for IMD. Work with the case to identify and follow all close contacts (refer to Contact Management section). Complete the *Bacterial Disease Surveillance Form– Neisseria meningitidis* dated February 2011 or later (section 9.3.2).
Contacts	Because of the severity of IMD and the increased risk of infection among close contacts (see below) of sporadic cases, aggressive contract tracing is essential to identify close contacts at increased risk of disease. The management of contacts of cases with conjunctivitis or pneumonia is the same as for contacts of invasive cases. The main components of IMD contact management include: *See contact investigation form.* 1. Identify and find all close contacts; 2. Educate and counsel all close contacts; 3. Offer prophylactic antibiotic therapy to all close contacts; and 4. Offer vaccine to all close contacts, if indicated (if the strain is deemed to be vaccine preventable).

1. Identify and Find All Close Contacts

Close contacts are defined as individuals who had the following type(s) of contact with the case during their infectious period (i.e. in the 7 days prior to symptom onset to 24 hours after the initiation of appropriate antibiotic therapy):

- Household contacts of the case;
- Persons who shared sleeping arrangements with the case;
- Non-household contacts who had sexual contact with the case;
- Persons who have had direct contamination of their nose or mouth with the oral/nasal secretions of the case (e.g. kissing on the mouth, shared cigarettes, shared drinking bottles, etc.);
- Health care workers who have had intensive unprotected contact (without wearing a mask) with the case (e.g. intubating, resuscitating or closely examining the oropharynx);
- Children and staff in child care and nursery school facilities; and
- Airline passengers sitting immediately on either side of the case (but not across the aisle) when the total time spent aboard the aircraft was at least 8 hours.

Note: School classmates, work colleagues, as well as social or sports contacts of a case are usually not considered close contacts unless they fit into one of the above categories.

2. Educate and Counsel All Close Contacts

People living in the same household as an IMD case are at 500 to1200-fold greater risk of developing IMD than the general population. The risk of secondary disease among close contacts is highest during the first few days after the onset of disease in the index case. Provide counselling and education to close contacts about:

- The risk of disease and need for prophylaxis;
- The signs and symptoms to recognize;
- The need to seek immediate medical attention should they develop febrile illness or other symptoms of IMD; and
- Information on the prophylactic antibiotic.

3. Offer Antibiotic Prophylaxis to All Close Contacts

- Individuals defined as close contacts should be offered prophylactic antibiotics, regardless of their immunization status. Prophylaxis should be given as soon as possible, preferably within 24 hours of case identification and up to 10 days after the last contact with the case. Antibiotics will be provided free of charge.
- Chemoprophylaxis is not recommended for casual contacts such as school, workplace or social contacts, as they are not considered close contacts unless they fit into one of the categories detailed above.

Recommended Chemoprophylaxis Regimens for Close Contacts*

Drug	Dosage	Comments
Ciprofloxacin	**Adults 18 years of age and older**: 500mg x 1 dose PO	• Contraindicated in pregnancy and lactation. • Only approved for persons 18 years of age and older. Not recommended for prepubertal children.
Rifampin	**Adults:** 600mg PO q12h x 4 doses	• Contraindicated in pregnancy. • Urine and tears may be

		Children 1 month of age and older: 10mg/kg (maximum 600mg) per dose PO q12h x 4 doses **Infants younger than 1 month of age**: 5mg/kg per dose PO q12h x 4 doses	stained red. Advise against wear of soft contact lenses as they can also be stained. • Can reduce effectiveness of oral contraceptives. Advise use of alternative contraceptive measures.
	Ceftriaxone	**Adults:** 250mg IM x 1 dose **Children younger than 12 years of age**: 125mg IM x 1 dose	• Recommended drug for pregnant women • Alternative for persons who cannot tolerate oral medication • Dilute in 1% lidocaine to reduce pain at injection site.

*****For the management of selected child care or hospital contacts, refer to the *Guidelines for the Prevention and Control of Meningococcal Disease* (see Reference section).

4. Offer Vaccine to All Close Contacts (if indicated)

Vaccination of susceptible close contacts, in addition to chemoprophylaxis, should be considered when the serogroup is vaccine preventable as it may further reduce the risk of subsequent meningococcal disease; vaccination should be carried out as soon as possible. The decision to immunize contacts will be made by the Chief Medical Officer of Health (CMOH) once the group of meningococcus is reported by the laboratory.

Outbreaks	If a higher than normal amount of disease activity is detected, contact your Regional Communicable Disease Coordinator (RCDC).
Health Education	• Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing and before preparing foods and eating. • Educate the public about the risks associated with sharing saliva-contaminated items (e.g. cigarettes, food, drinks, lipstick, etc.)

Health Settings Management

Infection Control Measures in Health Care Settings	Droplet
Occupational Health	Close contacts may require chemoprophylaxis.

Surveillance

Case Definition	**Confirmed case:** Clinical evidence of invasive disease with laboratory confirmation of infection: • Isolation of *Neisseria meningitidis* from a normally sterile site (blood, CSF, joint, pleural or pericardial fluid) **OR** • Demonstration of *N. meningitidis* DNA by an appropriately validated nucleic acid test (NAT) from a normally sterile site **Probable Case:** Clinical evidence of invasive disease with purpura fulminans or petechiae, with no other apparent cause and with non-confirmatory laboratory evidence: • Detection of *N. meningitidis* antigen in the CSF
Reporting Requirements and Forms	**IMD is a notifiable infection in Nunavut:** 1. Complete the *Bacterial Disease Surveillance Form– Neisseria meningitidis* dated February 2011 or later (section 9.3.2).

	2. Fax the form, within 24 hours of case notification, to the RCDC as follows: • Qikiqtaaluk: 867-975-4833 • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 3. If you cannot contact your RCDC, contact the TCDC at: 867-975-5734.

Tools

Guidelines	Public Health Agency of Canada. Guidelines for the prevention and control of invasive meningococcal disease. CCDR, 2005; 31 Supplement 1:1-26. Available online at the Nunavut Department of Health website: http://www.gov.nu.ca/health
Materials & Resources	**Fact Sheet: Meningococcal Disease**
Cross Reference	Nunavut Immunization Manual: Meningococcal Immunization protocol

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Meningococcal-Disease-Invasive-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Public Health Agency of Canada. Guidelines for the prevention and control of invasive meningococcal disease. CCDR, 2005; 31 Supplement 1:1-26. Available online at the Nunavut Department of Health website: http://www.health.gov.nu.ca/en/HealthCareProfessionals.aspx

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on August 12, 2013.

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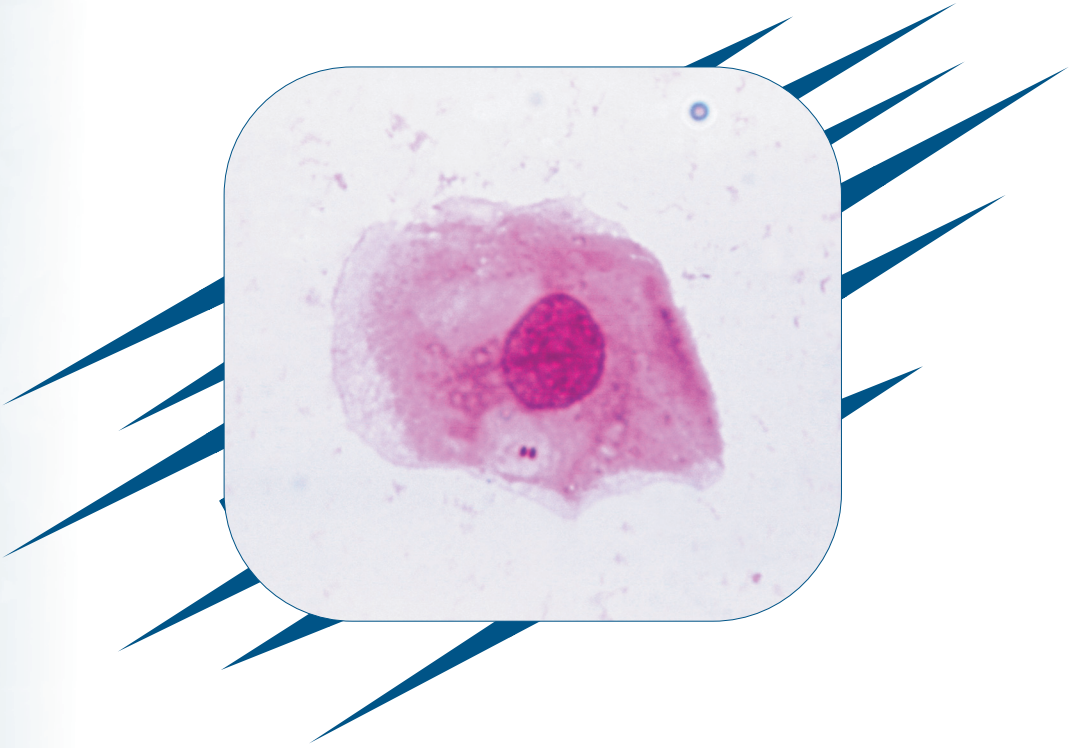
Supplement

Guidelines for the Prevention and Control of Meningococcal Disease



Public Health Agency of Canada
Agence de santé publique du Canada
Canada

Guidelines for the Prevention and Control of Meningococcal Disease

TABLE OF CONTENTS

1.0 Introduction

Guidelines for the control of meningococcal disease were last published in 1994, following a 1993 Canadian Consensus Conference on Meningococcal Disease[1]. Since that time, meningococcal C conjugate vaccines have been licensed. These revised guidelines provide updated case definitions and public health control measures, taking into account new advances in diagnostic and vaccine technology.

2.0 Objectives

These guidelines have been prepared to assist in the public health investigation and management of sporadic cases, outbreaks and persistently elevated rates of invasive meningococcal disease (IMD) in Canada. The guidelines address the following:

- surveillance and reporting;
- public health response to sporadic cases, including those aboard airplanes;
- chemoprophylaxis and immunoprophylaxis of close contacts;
- outbreak control;
- communication strategies.

3.0 Epidemiology of Invasive Meningococcal Disease in Canada

Updates on the epidemiology of IMD are published periodically in the Canada Communicable Disease Report (CCDR) and in the National Advisory Committee on Immunization (NACI) meningococcal vaccine statements. The most recent report was published in February 2004[2]. Readers are referred to these reports for more detailed information.

Meningococcal disease is endemic in Canada, periods of increased activity occurring roughly every 10 to 15 years with no consistent pattern. The incidence rate of meningococcal disease has varied considerably with different serogroups, age groups, geographic locations and time. The last major epidemic, due to serogroup A, occurred in 1940-1943, when the peak incidence rate was close to 13 per 100,000 population per year. Since then the overall incidence of disease has remained at or below 2 per 100,000 per year (range 0.5 to 2.1)[2-5]. There were sporadic localized outbreaks and periods of elevated incidence of serogroup C disease during 1989-1993 and 1999-2001[2,3]. Immunization campaigns using serogroup C polysaccharide and conjugate vaccines were implemented in some regions during that period.

Case-by-case data for IMD in Canada are available from 1985 to 2001. During this period, an average of 305 cases of meningococcal disease were reported annually. Overall, the incidence rate has been highest among children £ 1 year of age, and then it declines as age increases except for a smaller peak in the 15- to 19-year age group. Disease occurs year round, but there is seasonal variation with the majority of cases occurring in the winter months.

Of the small numbers of isolates characterized from 1971 to 1974, *Neisseria meningitidis* serogroups A and C were most frequently identified[6]. From 1975 to 1989, serogroup B predominated. The majority were serotype 2b, 4 and 15, and the most common subtype was P1.2[7]. In 1986, a new clone of serogroup

C, serotype 2a characterized by multilocus enzyme electrophoresis (MLEE) as electrophoretic type 15 (ET-15), was identified in Canada for the first time[7]. Since then serogroups B and C have been responsible for most of the cases of endemic disease in Canada. Serogroup C isolates have almost exclusively been responsible for outbreaks in schools and communities. In addition, IMD caused by serogroup C has had a higher case fatality ratio and a greater incidence among adolescents than disease caused by serogroup B.

4.0 Definitions

4.1 National Case Definition

Table 1

Confirmed Case	Invasive disease[1] with laboratory confirmation of infection: ! isolation of *N. meningitidis* from a normally sterile site (blood, cerebrospinal fluid [CSF], joint, pleural or pericardial fluid); OR ! demonstration of *N. meningitidis* DNA by appropriately validated nucleic acid test (NAT)[2] from a normally sterile site.
Probable Case	Invasive disease[1] with purpura fulminans or petechiae and no other apparent cause: ! with demonstration of *N. meningitidis* antigen in the CSF; OR ! in the absence of isolation of *N. meningitidis* or demonstration of DNA by appropriately validated NAT[2] from a normally sterile site.

[1]Invasive meningococcal disease usually manifests itself as meningitis and/or septicemia, although other manifestations may be observed (e.g. orbital cellulitis, septic arthritis). Invasive disease may progress rapidly to purpura fulminans, shock and death.

[2]Each jurisdiction will have a validation process for the NAT that they have in place.

Both confirmed and probable cases of IMD are notifiable at the national level. The national case definition underwent revision in 2005. The new case definition will become effective 1 January, 2006 and now includes demonstration of *N. meningitidis* DNA by appropriately validated nucleic acid test (NAT) from a normally sterile site. Meningococcal DNA can be found in the CSF up to 96 hours after antibiotics have been started[8].

4.2 Definitions for Public Health Management

For the public health management of sporadic cases, outbreaks and persistently elevated rates of disease, the following definitions have been developed.

4.2.1 Cases and Contacts

Tables 2 and 3 provide definitions of cases and close contacts.

Table 2: Description of Cases

Sporadic Case	A single case occurring in a community where there is no evidence of an epidemiologic link (by person, place or time) to another case.
Index Case	The first case occurring in a community.

Subsequent Case	A case with onset of illness subsequent to another case with whom an epidemiologic link can be established. This category includes **co-primary cases** (a person who develops illness within 24 hours of onset of illness in the index case), as well as **secondary cases** (a person developing illness > 24 hours after onset of illness in the index case).

An epidemiologic link can be established when a person has one or both of the following in common with a confirmed case:

- contact with a common, specific individual (including confirmed or probable cases),
- presence in the same location (e.g. work, school, a bar or party) at or around the same time.

Table 3: Definition of Close Contacts

- Household contacts of a case
- Persons who share sleeping arrangements with the case
- Persons who have direct contamination of their nose or mouth with the oral/nasal secretions of a case (e.g. kissing on the mouth, shared cigarettes, shared drinking bottles)
- Health care workers (HCWs) who have had intensive unprotected contact (without wearing a mask) with infected patients (e.g. intubating, resuscitating or closely examining the oropharynx)
- Children and staff in child care and nursery school facilities
- Airline passengers sitting immediately on either side of the case (but not across the aisle) when the total time spent aboard the aircraft was at least 8 hours (see section 7.1.4)

For public health management, cases that occur after the index case with which an epidemiologic link can be established may have acquired the disease directly from the index case or from another common source. Subsequent cases can be early, intermediate or late. Subsequent cases that occur early (within 24 hours), termed co-primary cases, most likely acquired the disease from a common source. Conversely, subsequent cases that occur after 24 hours, or secondary cases, may have acquired the disease in either fashion.

The likelihood of person-to-person transmission of meningococcal disease is related to both the nature and duration of the contact with a confirmed case. Studies carried out before the routine use of chemoprophylaxis have revealed that people who lived in the same household as an IMD case were at 500 to 1200 fold greater risk of IMD than the general population[9,10]. The risk is highest in the first week after onset of illness in a case and decreases thereafter[9,11]. Studies of transmission of IMD in child care facilities and nursery schools have been conflicting but suggest that there is an increased risk of secondary cases, although the risk is lower than in the household setting[9,12]. Increased risk of IMD has not been shown in casual contacts of sporadic cases[13-16]. Therefore school/classroom, transportation, workplace or social contacts are not considered as close contacts unless their specific relationship with the case identifies them as such (see Table 3).

Nosocomial transmission of IMD is very uncommon, especially when routine practices and (large) droplet and contact precautions are followed to prevent the transmission of IMD. In rare instances, direct contact with respiratory secretions of infected persons (e.g. during mouth-to-mouth resuscitation) has resulted in transmission to HCWs. A pediatrician in France developed IMD a week after intubating a comatose child with meningococcal disease[17,18]. Therefore, HCWs are considered as close contacts if they have had intensive, unprotected contact (without wearing a mask) with infected patients (e.g. intubating, resuscitating or closely examining the oropharynx)[19].

In certain countries, such as Canada, where chemoprophylaxis of close contacts is routinely administered for sporadic cases, 0.3% to 3% of cases of meningococcal disease occur in contacts of the index case[10,11,20,21], with a median interval between the index and the secondary case of 7 weeks in one study[11]. Some of these secondary cases can be attributed to failure of chemoprophylaxis (e.g. failure of administration, poor compliance, presence of antibiotic resistance)[20,22-24]. "Late" secondary cases in close contacts may occur several months after the onset of symptoms in the index case[11,12].

4.2.2 Outbreaks

An outbreak is defined as increased transmission of *N. meningitidis* in a population, manifested by an increase in cases of the same serogroup.

Outbreaks can be subdivided into organization-based or community-based outbreaks using the criteria shown in Table 4.

Table 4: Types of Outbreak

Organization-based	Increased transmission of *N. meningitidis* in an organization or institution with two or more cases of the same serogroup occurring within a 4-week interval. This includes restricted populations, such as schools, day care, sports groups or social groups, as well as nursing homes or long-term care facilities.
Community-based	Increased transmission of *N. meningitidis* in a community, with three or more confirmed cases of the same serogroup occurring within a 3-month interval AND an age-specific incidence OR specific community population incidence of approximately 10/100,000, where there is an absence of an epidemiologic link between cases. This is not an absolute threshold and should be considered in the context of other factors (see section 7.2).

When threshold incidence rates are being calculated in order to establish whether continued transmission of *N. meningitidis* is occurring in a community, the calculation should be specific to the situation. If the cases are occurring among persons of a specific age range, the calculation should be an age-specific incidence. However, if the population is defined geographically, the calculation should use the total community population defined by that region. For the calculations, subsequent cases among close contacts should be excluded from the numerator. Age-specific incidence should be calculated for 5-year age groups (e.g. 0 to 4 year olds, 5 to 9 year olds, 10 to 14 year olds). For example, in a community with 10 cases, of which 2 live in the same household, only 9 cases are included when calculating age-specific incidence rates for the purpose of determining whether an outbreak or ongoing transmission is occurring.

4.2.3. Persistently Elevated Rates

Persistently elevated rates of disease are observed when there is ongoing occurrence of cases of meningococcal disease of the same serogroup at rates above the expected level of disease in a given population. These cases can be sporadic or outbreak-related and continue to occur despite local public health control measures.

5.0 Diagnosis and Bacterial Typing

Laboratory confirmation of a clinical diagnosis of IMD is important for the identification and management of cases and outbreaks, as well as for regional and national surveillance and detection of

epidemiologic trends over time. Meningococcal isolates from all IMD cases should routinely be sent to the provincial/territorial laboratory to ensure appropriate and timely monitoring of serogroups and for antibiotic susceptibility testing. Isolates are forwarded to the Public Health Agency of Canada's National Microbiology Laboratory (NML) for further phenotypic typing and genetic analysis.

Culture of blood, cerebrospinal fluid (in the absence of contraindications to lumbar puncture) and other normally sterile sites is required for isolating bacteria for identification. Polymerase chain reaction (PCR) testing is available in several centres across Canada for rapid molecular diagnosis of meningococcal infection and serogroup identification on whole blood and cerebrospinal fluid. PCR has greater sensitivity than culture, particularly if there has been prior administration of antibiotics[8,25-27]. Latex agglutination antigen testing may be a useful adjunct.

Several laboratory methods are used to track the epidemiology of *N. meningitidis* in Canada. The serogroup, serotype and serosubtype of the organism can be determined using antibody or by DNA sequencing of the responsible genes. Antigenic variation in proteins located in the outer membrane of the organism can be detected. For example, an isolate of *N. meningitidis* C:2a:P1.2 is of serogroup C, serotype 2a and serosubtype P1.2.

In addition, genotyping procedures can be done, such as multilocus enzyme electrophoresis (MLEE), multilocus sequence typing (MLST) and pulsed field gel electrophoresis (PFGE). MLEE and MLST are most suitable for studying global molecular epidemiology. PFGE can be useful in discriminating strains of *N. meningitidis* within a population, particularly during a period of increased incidence of disease. Knowledge of PFGE patterns can be most useful for smaller populations in which the incidence of disease may be very high but there are only a few cases, and more discriminatory tests are required to determine whether these are unrelated cases caused by different strains or whether there is increased transmission of a particular strain.

6.0 Surveillance of Invasive Meningococcal Disease in Canada

IMD is reportable in all provinces and territories and is nationally notifiable. Each province or territory has procedures in place for the rapid notification of cases to medical officers of health and timely reporting to the appropriate provincial or territorial public health official.

Both confirmed and probable cases of IMD are notifiable at the national level. Provinces and territories report case-by-case data with basic core variables on a weekly basis to the Notifiable Diseases Reporting System. In addition, the Immunization and Respiratory Infections Division (IRID), Centre for Infectious Disease Prevention and Control, Public Health Agency of Canada, conducts enhanced surveillance for IMD. Provinces and territories report more detailed epidemiologic and laboratory data for each case to the IRID. Detailed surveillance reports are published periodically in the *CCDR*; the most recent report was published in February 2004[2].

Most jurisdictions rely on passive surveillance for identification of cases. When an increase in the incidence of IMD is suspected in a particular region, there should be heightened surveillance for cases and the collection of more detailed epidemiologic and microbiologic information.

The following steps should be taken:

- The provincial or territorial epidemiologist or medical health officer should be consulted immediately to decide whether the increased incidence constitutes an outbreak.
- Active surveillance should be initiated. Epidemiologic information should be obtained on each case, with the objective of identifying high-risk groups and determining associations that will permit targeted control interventions. The data collected should include age; sex; place of residence; vaccination status, including the type of meningococcal vaccine, the number of doses and age at vaccine administration; recent travel; attendance or employment at a day care centre or school; and participation in recent athletic or recreational events and gatherings. Other information relevant to the outbreak should also be collected (e.g. social or cultural setting).
- Basic epidemiologic analysis should include age-group-specific attack rates (calculated for 5-year age groups), serogroup-specific rates and case fatality ratios. Techniques such as historical modeling can be used to determine whether the current incidence is greater than in previous years; this is particularly important in light of the seasonality of the disease.
- The province or territory should notify the IRID of the increase in IMD incidence, and the IRID will relay the information to the other provinces and territories.
- When an outbreak is suspected, serogroup determination becomes critical for appropriate decisions regarding control measures. Provincial and territorial public health laboratories, in collaboration with the NML, may conduct typing, subtyping and other genotyping tests (e.g. PFGE) that have proven helpful in characterizing outbreaks and determining disease trends.
- During outbreaks or whenever there is failure to isolate or determine the serogroup of an organism, clinical specimens should immediately be forwarded by the provincial laboratory to the NML, Public Health Agency of Canada, for molecular diagnostic testing and further strain identification.

At this time conjunctivitis and pneumonia cases due to *N. meningitidis* are not nationally notifiable and reported to the Public Health Agency of Canada. However the following definitions and suggested treatments have been made. A conjunctivitis case requires isolation of *N. meningitidis* from the eye or the conjunctival sac in association with purulent conjunctivitis. A pneumonia case is one with a Gram strain (if done) showing Gram-negative diplococci and a polymorphonuclear cell response from sputum or respiratory aspirate, isolation with heavy growth of *N. meningitidis* and clinical or radiological evidence of pneumonia. Patients with *N. meningitidis* conjunctivitis or pneumonia should be treated with appropriate systemic antibiotics[28].

7.0 Management of Invasive Meningococcal Disease

The management of cases of IMD is divided into two sections, the management of sporadic cases and the management of outbreaks.

7.1 Management of Sporadic Cases

The public health response to a sporadic case of IMD includes management of the sporadic case, contact identification and tracing, and maintenance of surveillance for further cases.

7.1.1 Case Management

When there is a strong clinical suspicion of IMD and laboratory confirmation of the diagnosis may be delayed, a specimen from a normally sterile site should be obtained for culture (or other laboratory identification of *N. meningitidis*) if possible and empiric therapy started quickly. The case or a proxy for the case should be interviewed to determine who are the close contacts (see Table 3). In addition to therapeutic antibiotics, the case should receive chemoprophylaxis before hospital discharge unless the infection was treated with an antibiotic that is effective in nasopharyngeal eradication of *N. meningitidis*[29]. Nasopharyngeal cultures, used to demonstrate carriage of *N. meningitidis*, have no role in the identification or management of cases and contacts.

7.1.2 Contact Management

The cornerstone of prevention of secondary cases of IMD is aggressive contact tracing to identify people at increased risk of disease (i.e. close contacts). The management of close contacts of cases with conjunctivitis or pneumonia is the same as for close contacts of invasive disease. Chemoprophylaxis should be provided to close contacts in order to eliminate meningococci from any carrier within the network of close contacts, thereby reducing the risk to other susceptible individuals in the social network (see Section 10.0 Recommendations for Chemoprophylaxis)[30]. Nasopharyngeal carriage of meningococci is common: at any given time about 10% of the population carry meningococci. The rationale for providing chemoprophylaxis for HCWs who are close contacts (see Table 3) is different from that for other close contacts. The time of exposure can be clearly identified. Antibiotics that eliminate carriage given soon after that exposure would be expected to eliminate carriage and prevent potential development of disease in treated individuals. Currently, no studies have assessed the effectiveness of chemoprophylaxis in this situation[31].

Close contacts of an IMD case are at increased risk of secondary disease[9-11]. They should be alerted to signs and symptoms of meningococcal disease and be advised to seek medical attention immediately should they develop febrile illness or any other clinical manifestations of IMD. Chemoprophylaxis should be offered to all persons having close contact with an IMD case during the infectious period (the 7 days before onset of symptoms in the case to 24 hours after onset of effective treatment), regardless of their immunization status (see section 10.0 Recommendations for Chemoprophylaxis). Chemoprophylaxis of close contacts should be administered as soon as possible and preferably within 24 hours of case identification but is still recommended for up to 10 days (the incubation period) after the last contact with an infectious case. Chemoprophylaxis should be considered for close contacts of a case that is strongly suspected to be IMD, even if laboratory confirmation cannot be obtained within 24 hours.

The vaccination status of close contacts, including the type of meningococcal vaccine, the number of doses and age at vaccine administration, should be determined. Vaccination of susceptible close contacts, in addition to chemoprophylaxis, should be considered when the serogroup is vaccine preventable, as it may further reduce the risk of subsequent meningococcal disease; vaccination should be carried out as soon as possible (see section 11: Indications For and Use of Meningococcal Vaccines). The increased risk of disease for household contacts persists for up to 1 year after disease in the index case and beyond any protection from antibiotic chemoprophylaxis[10,11,20,21].

In the United Kingdom (UK) it is recommended that close contacts of cases with vaccine-preventable strains of *N. meningitidis* who received chemoprophylaxis should be offered an appropriate vaccine[32]. However, in the UK a different definition of “close contacts” is used than in Canada. The National

Advisory Committee on Immunization (NACI) recommends that vaccination of unimmunized household and intimate social contacts may further reduce the risk of secondary cases beyond the benefit of chemoprophylaxis[33].

7.1.3 Cadavers and Infectious Risk

While cadavers with meningococcal disease have traditionally been considered a possible source of infection risk, if the deceased person had been treated with an effective antibiotic for at least 24 hours before death, any risk is likely to be very low. If the deceased had not been treated with an effective antibiotic before death, then it is prudent for those who have occupational contact with a cadaver to follow routine infection control practices with additional droplet and contact precautions[30,34,35].

In general, when caring for the deceased, attention to routine infection prevention and control practices is sufficient, specifically, adherence to the routine infection control practices for hand washing/hand hygiene, mask/eye protection/face shields, glove and gown use. In addition, individuals who die in a home setting should be wrapped in a sheet (ideally using a plastic bag to protect the mattress and contain body fluids) and preferably kept in a cool, dry location until collected by funeral services[35].

7.1.4 Invasive Meningococcal Disease in Travellers

When an IMD case has been identified in a traveller who was within the infectious period during the journey, a decision on the need for contact tracing and chemoprophylaxis should be based on the mode of transportation, the length of time fellow travellers could have been exposed to the case and the type of exposure. Any decision should be made in collaboration with the provincial or territorial epidemiologist or medical health officer.

To date, there have been no published cases of IMD resulting from transmission aboard aircraft. However, there have been reports of transmission of tuberculosis during air travel[36,37]. Current surveillance systems may not detect secondary cases resulting specifically from air travel. Therefore the theoretical risk of transmission during air travel should be considered. Contact tracing of specified passengers is advised by the Centers for Disease Control and Prevention in the United States and by the Communicable Diseases Network Australia[30,36]. However, prophylaxis of persons travelling in the next seat on the same plane is not advised in the United Kingdom, unless the individual is already identified as a close contact[32].

On the basis of expert opinion and the extrapolation of data on secondary transmission of tuberculosis cases aboard aircrafts, it is recommended that contact tracing be initiated if

- the case travelled during the infectious period (7 days before onset of symptoms to 24 hours after the onset of effective treatment)
- the flight occurred within the previous 10 days (i.e. still eligible for prophylaxis)

AND

- the total time spent aboard the aircraft was at least 8 hours, including ground time on the tarmac.

It is important to note that aircraft passenger manifests are rarely kept after 48 hours, and contact tracing may be more difficult after that time.

An attempt should be made to trace, contact and offer antimicrobial chemoprophylaxis and vaccination, if appropriate, to the following:

- persons travelling with the index case who have had prolonged close contact (e.g. room-mates);
- passengers who were sitting immediately on either side of the index case (but not across the aisle);
- passengers or flight staff who have had direct contact with the respiratory secretions of the index case.

These individuals may be at increased risk, as bacteria transmitted through respiratory droplets can be propelled short distances (< 1 m) during coughing and sneezing[35].

7.2 Detection and Management of Outbreaks

Outbreaks can be broadly classified as organization-based or community-based (see Table 4). Regardless of the type of outbreak, contract tracing, identification of close contacts and provision of chemoprophylaxis to close contacts need to be conducted as described for sporadic cases (see section 7.1). There is no evidence to support the provision of widespread chemoprophylaxis for persons who are not close contacts. Widespread use may result in eradication of benign strains of *Neisseria* that provide protective antibodies, the generation of drug-resistant strains and an increase in the prevalence of drug-related adverse events[38].

Outbreak detection and management require complex decision-making that takes into account a variety of factors. When evidence suggests that an outbreak is occurring with increased transmission of *N. meningitidis* involving a vaccine-preventable serogroup in a delineated population, vaccination of persons at high risk should be considered. The type of association between cases helps to define the group at risk. Decisions regarding the use of vaccine in communities with a higher than expected rate of disease should be made in consultation with the provincial or territorial epidemiologist or medical health officer.

The following considerations can be useful in determining whether there is increased transmission of *N. meningitidis* within a defined population:

- An increased rate of disease, as outlined in Table 4.
- In smaller populations, the clustering of disease in an age group. In large populations, one may see a shift in age distribution during an outbreak.
- The same serogroup occurring in the cases. For IMD caused by serogroup B and C, the likelihood that two strains are related increases as one goes from common serogroup, to common serotype to common electrophoretic type. A discussion with a medical microbiologist or laboratory expert is required to ascertain the degree of relatedness.

The criteria for vaccination should be sufficiently broad to control the outbreak. Ongoing surveillance to assess the effectiveness of outbreak control is essential and may result in changes to the target group for which vaccination is recommended.

The presence of a particular vaccine-preventable serogroup is the most important laboratory characterization in evaluating the need for immunoprophylaxis (i.e. serogroup C, W135, Y or A). The following additional factors should be taken into account when considering a vaccination campaign:

- The population at risk of the disease must be clearly defined. Identification of target groups and boundaries for vaccination programs (e.g. age, place of residence or activity) may be determined on the basis of the characteristics of the community and the epidemiologic features of the cases.
- The risk of disease must be sufficiently high to justify implementing a vaccination campaign (statistical modeling techniques may be helpful).
- The most appropriate available vaccine should be used for the population at risk (refer to section 11.0).
- Mechanisms for sufficient vaccine acquisition and delivery must be in place.
- For optimal outbreak control, vaccine program planning should aim to achieve high coverage rates in target groups[39].
- Environmental factors that might increase a population's susceptibility (e.g. influenza epidemic) should be considered.

7.3 Management of a Persistently Elevated Rate of Meningococcal Disease

Effective local management of cases and identified outbreaks remains the cornerstone of prevention and control of IMD. Consideration of a systematic regional or provincial/territorial vaccination strategy may be needed if there are unacceptably high projected rates of disease and mortality despite ongoing regional outbreak interventions.

Outbreak management is usually carried out as an emergency measure and results in disruption of routines, a higher cost of vaccine delivery, overuse of chemoprophylaxis and the sudden demand for large quantities of vaccine. If a large proportion of the population is vaccinated because of the occurrence of multiple localized outbreaks and disease is still occurring, the decision to extend vaccination to the remainder of the population at risk may be considered.

Although general recommendations for systematic regional and provincial/territorial vaccination cannot be made, consideration may be given to this strategy in the circumstances outlined above. All levels of public health jurisdictions should ensure that they have specific contingency plans for mass vaccination. A decision of this nature must take into account public concern and political realities but cannot be based solely on these factors.

The effectiveness of outbreak control measures should be evaluated in order to ascertain whether continued occurrence of cases after a mass vaccination campaign is due to vaccine failure, poor immunization coverage, inadequate definition of the target population or other reasons.

8.0 Communication Strategies

8.1 Communication Pertaining to Sporadic Cases

There is usually no need to inform the general public of a sporadic case, even if it involves a fatality. However, it is important that a communication strategy be prepared in advance in order to address any questions that may arise among those concerned with the control measures. Details of the communication strategy need to be tailored to the context of the sporadic case (e.g. liaison with school authorities is important when a case is a student).

8.2 Communication Pertaining to Outbreaks

It is essential that a communication strategy be in place to provide timely information to the public when an outbreak occurs. A communication strategy aimed at the health care community should also be developed. This should include the criteria and the process for reporting to public health, timely surveillance reports and updates, guidelines on early diagnosis (including signs and symptoms), and recommended treatment and prophylactic measures. It is important to involve the health care community as early as possible after the recognition of an outbreak. An outbreak advisory committee comprising public health representatives, clinicians and medical laboratory personnel should be established. It is particularly important that the adjacent local, provincial and/or territorial jurisdictions be informed about the outbreak and related control strategies. The IRID of the Public Health Agency of Canada should be informed of all outbreaks and is responsible for informing other Canadian and international public health authorities.

8.3 Communication Pertaining to Persistently Elevated Rates

It is essential that a communication strategy be prepared before a decision is made to undertake a program of systematic vaccination. This should be designed and managed with input from a communications expert. In addition to the principles previously described, essential elements of a communication strategy include the following:

- Wide consultation with public health representatives, clinicians and laboratory personnel before any decision is made.
- Clearly designated responsibilities. Public health authorities should be responsible for the announcement of the decision and the management of communications with respect to the operation of a control program.
- Within each organization, one spokesperson should be responsible for communicating with the media.

9.0 Recommendations for Travellers

9.1 Travellers to Destinations Within Canada

Under most circumstances, Canadians travelling within Canada do not need to take special precautions to protect themselves from meningococcal disease. The risk of acquiring IMD as a traveller in North America is low, even in areas with higher than usual rates of disease. Therefore, preventive measures, including the use of vaccine, are not warranted.

Special circumstances under which a Canadian travelling within Canada should consider vaccination include the following:

- the individual is travelling to an area where there is an outbreak for which an immunization program is in progress AND
- the individual travelling is of an age that falls within the population targeted for immunization by the local health authorities AND
- the individual's duration of stay in the outbreak area is for an extended period of time (e.g. attendance for a school term).

These persons are more likely to interact with the population at increased risk of transmission (the population targeted for immunization). The decision to recommend vaccination for travellers within Canada who meet these criteria should be based on individual risk assessment. The nature of the travel and the type of contact with the population at risk are important factors to consider (e.g. a child staying in a hotel has a different risk from a teenager attending parties). The traveller should be appropriately counselled on the risk-benefit in order to make an informed decision. In most circumstances, immunization upon arrival at the outbreak or hyperendemic area is sufficient, but consideration could be given to immunization before arrival.

9.2 Students Attending Colleges in the United States

The Advisory Committee on Immunization Practices in the United States (US) has recommended that all US college students should be informed of the risk of meningococcal disease and the availability of a vaccine, so that they are able to make informed individual decisions regarding vaccination against serogroup C meningococcal disease[40]. These recommendations were made in light of outbreaks that have occurred in US colleges. No such outbreaks have occurred in Canada. Canadian students who will be attending college in the US should inform themselves of the policies of the institution that they will be attending, as they may be required to provide proof of serogroup C immunization before starting their studies. NACI recommends that all Canadian adolescents and young adults be immunized with meningococcal C conjugate vaccine[33]. As students attending colleges and universities are included in this recommendation by virtue of their age, there is no need to make special recommendations for this group of people.

9.3 Travellers to International Destinations

International travellers should be aware of the risk of IMD at their destination of choice. IMD occurs sporadically worldwide and in focal epidemics. The traditional endemic or hyperendemic areas of the world (the “meningitis belt”) include the savannah areas of sub-Saharan Africa extending from Gambia and Senegal in the west to Ethiopia and Western Eritrea in the east. Health care professionals advising Canadian travellers should remain current with global meningococcal activity. Current meningococcal outbreak information can be obtained through the Public Health Agency of Canada, Travel Medicine Program (<www.travelhealth.gc.ca>) and the World Health Organization (WHO) (<http://www.who.int/csr/don/archive/disease/meningococcal_disease/en/>).

Quadrivalent meningococcal vaccine is recommended for Canadian international travellers requiring meningococcal vaccine. Meningococcal C conjugate vaccine alone is not appropriate for protection of travellers, as it does not protect against serogroups A or W135, which are endemic in selected regions of the world. The Committee to Advise on Tropical Medicine and Travel (CATMAT) provides guidelines for health care providers counselling Canadian international travellers on meningitis vaccination. For complete information on CATMAT's Statement on Meningococcal Vaccination for Travellers visit <www.catmat.gc.ca>.

9.4 International Travellers Arriving in Canada

Under the authority of the *Quarantine Act*, international travellers arriving in Canada who are ill and assessed as possibly having IMD will be referred for medical examination at local health facilities. Information about these travellers will be transferred to appropriate public health authorities.

10.0 Recommendations for Chemoprophylaxis

The purpose of chemoprophylaxis is to eradicate nasopharyngeal colonization by *N. meningitidis* and thus prevent disease in contacts and transmission to susceptible persons[30,31,41]. In addition, levels of chemotherapeutic agents in nasal secretions may prevent acquisition of the organism for a few days[31]. Chemoprophylaxis is not effective in preventing disease once invasion of tissue has taken place. Internationally, there are no uniform recommendations regarding chemoprophylaxis. Most jurisdictions recommend chemoprophylaxis for household contacts, but jurisdictions vary with respect to their recommendations for other types of close contacts and for the index case[29]. A recent systematic review of evidence for control policies for IMD determined that the evidence supports the use of chemoprophylaxis for household contacts and for index cases. However, there were insufficient studies to examine evidence for chemoprophylaxis in child care settings[29]. Further studies are needed.

On the basis of the available evidence and expert opinion, it is recommended that cases and all close contacts (Table 3) should receive chemoprophylaxis. The index case should receive antibiotics that eradicate nasopharyngeal carriage before discharge from hospital, unless treated with an agent that also effects nasopharyngeal eradication of *N. meningitidis* (e.g. ceftriaxone), as therapy alone may not eliminate carriage of the organism[29,42].

Chemoprophylaxis is not routinely recommended for health care contacts, including emergency personnel. Only those health care workers who have had intensive unprotected contact (i.e. without wearing a mask) with infected patients (e.g. intubating, resuscitating or closely examining the oropharynx) require prophylaxis.

Chemoprophylaxis is unlikely to be of benefit if given > 10 days after the most recent exposure to an infectious case. Chemoprophylactic agents should be administered only to close contacts whose most recent exposure to the case was within the period of communicability (see section 7.1). Provincial and territorial public health authorities should ensure that chemoprophylaxis is available free of charge to all close contacts, as defined in Table 3. Its distribution should be facilitated through local public health authorities or, with their agreement, obtained through hospital pharmacies.

The chemoprophylactic agents recommended for the eradication of nasopharyngeal colonization by *N. meningitidis* are rifampin, ciprofloxacin and ceftriaxone (Table 5)[41,43]. It is important to ensure that contacts requiring chemoprophylaxis complete the recommended course. Ciprofloxacin can be given in a single oral dose and is an alternative in adults, but it is contraindicated in pregnancy and is not recommended for prepubertal children. Ceftriaxone is the recommended chemoprophylactic agent for pregnant women. A case-control study among young adults in Cairo, Egypt, showed that a single dose of azithromycin (500 mg, given orally) was effective and was comparable to rifampin (600 mg twice a day for 2 days, given orally) in the short-term eradication of *N. meningitidis* from the nasopharynx of carriers. In addition there has been a report of the successful control of an outbreak of serogroup B meningococcal disease among pre-school children using azithromycin after failure of rifampin chemoprophylaxis[44,45]. At this time, there is no specific recommendation to use azithromycin routinely for chemoprophylaxis in Canada, but further studies are warranted.

Table 5: Chemoprophylaxis for Close Contacts of IMD Cases

Drug	Dosage	Comments
Ciprofloxacin	**Adults ³ 18 years of age**: 500 mg x 1 dose PO	Contraindicated during pregnancy and lactation. Only approved for persons > 18 years of age. Not recommended for prepubertal children.
Rifampin	**Adults**: 600 mg PO q12h x 4 doses **Children ³ 1 month of age**: 10mg/kg (maximum 600 mg) per dose PO q12h x 4 doses **Infants < 1 month of age**: 5mg/kg per dose PO q12h x 4 doses	Contraindicated in pregnancy. Urine and tears may be stained red. Advise against wear of soft contact lenses as they can also be stained. Can reduce effectiveness of oral contraceptives. Advise use of alternative contraceptive measures.
Ceftriaxone	**Adults**: 250 mg IM x 1 dose **Children <12 years**: 125 mg IM x 1 dose	Recommended drug for pregnant women. Alternative for persons who cannot tolerate oral medication. Dilute in 1% lidocaine to reduce pain at injection site.

11.0 Indications For and Use of Meningococcal Vaccines

NACI publishes detailed recommendations pertaining to the use of meningococcal vaccines. Readers are referred to these recommendations for more detailed information[33,46]. Recommendations are also contained within the most recent edition of the *Canadian Immunization Guide*[47]. Recommendations are updated as new information becomes available.

Briefly, there are two different types of meningococcal vaccine currently available in Canada: purified capsular polysaccharide vaccines and protein-polysaccharide conjugate vaccines. Polysaccharide vaccines include bivalent vaccine against serogroups A and C (MenAC-Ps) and quadrivalent vaccine for serogroups A,C, Y and W135 (MenACYW-Ps). Three monovalent meningococcal C conjugate vaccines (MenC-conjugate) are currently available: Menjugate™ (Chiron Corporation), Neis Vac-C™ (ID Biomedical Corporation) and Meningitec™ (Wyeth Pharmaceuticals).

Meningococcal C conjugate vaccines are safe, immunogenic and effective, and can be given to children < 2 years of age. The conjugate vaccine is also expected to confer longer duration of immunity compared with the polysaccharide vaccine. In addition to outbreak control, the Public Health Agency of Canada and NACI recommend routine childhood immunization with meningococcal C conjugate vaccine[33,47].

Polysaccharide vaccines cover three additional serogroups compared with conjugate meningococcal C vaccines (i.e. serogroups A, Y, W135), but they are not immunogenic for children < 2 years of age and have a shorter duration of protection. Polysaccharide vaccines are recommended for outbreak control, for the protection of persons travelling to locations with epidemic disease attributable to vaccine serogroups and for persons who may be at increased risk of meningococcal disease. Polysaccharide vaccines are not recommended for routine childhood immunization[33].

11.1 Close Contacts

Bivalent (A, C) or quadrivalent (A, C, Y, W135) polysaccharide vaccine should be considered for eligible susceptible close contacts of cases with IMD known to be caused by serogroup A; quadrivalent polysaccharide vaccine should be considered for eligible susceptible close contacts of cases of serogroup Y or W135 disease (see section 11.3 for information on revaccination). For susceptible close contacts of known serogroup C disease, meningococcal C conjugate vaccine is preferred because of longer duration of protection and induction of immunologic memory. However, polysaccharide vaccines will provide protection in older children and adults during the 1-year period of increased risk. Polysaccharide vaccines are ineffective against serogroup C disease in children < 2 years of age, and meningococcal C conjugate vaccine should be given to children in that age group. No vaccine is currently available in Canada for contacts of individuals with serogroup B disease.

Vaccination is not generally indicated for contacts of cases of disease in which the serogroup has not been determined. With the increasing use of PCR techniques the sensitivity of diagnosis will improve; serogroup identification should be obtained before immunoprophylaxis where possible. Factors that may assist in decisions regarding whether “empiric” immunization of contacts should be provided include the availability of diagnostic tests, the epidemiologic situation (e.g. there is an outbreak of serogroup Y in the community and the index case is in the at-risk group), and the age and clinical presentation of the case. If a contact has received meningococcal vaccine in the past, decisions regarding revaccination should follow current NACI guidelines (see section 11.3).

11.2 Outbreaks

Outbreaks of serogroup C meningococcal disease in teenagers and adults may be controlled by use of meningococcal C conjugate or polysaccharide vaccines; however, the use of conjugate vaccine may be preferable because of the induction of immunologic memory and prolonged duration of protection[33]. In adults and children previously immunized with a polysaccharide vaccine, antibody response has been found to be lower after a second than after the first dose when the time interval between the two doses is less than the recommended 5 years. This response has been termed "immunologic hypo-responsiveness"[48-50] and has not been observed with conjugate vaccine[48]. Adults who have been vaccinated with a second dose of polysaccharide vaccine after the recommended interval have demonstrated an adequate response. The clinical significance of immunologic hyporesponsiveness is unknown, but if revaccination is considered in persons who received polysaccharide vaccine in the past, the use of meningococcal C conjugate vaccine is recommended. In younger children (< 10 years of age) meningococcal C conjugate vaccine is preferred for control of outbreaks in view of superior immunogenicity and efficacy in this age group. Children < 2 years of age should not receive the polysaccharide vaccine for prophylaxis but should complete a full course of conjugate vaccine appropriate to their age, according to the NACI recommended schedule[33].

Outbreaks of meningococcal A disease have not occurred in Canada since the 1940s. If this rare event occurs, polysaccharide vaccine is recommended. Readers are referred to the most recent NACI meningococcal vaccine recommendations for further information[33,46,47]. For the control of outbreaks associated with serogroup Y or W135 meningococci, one dose of a quadrivalent polysaccharide vaccine is recommended for persons $ 2 years of age.

11.3 Revaccination

The need for and effectiveness of revaccination with polysaccharide vaccine has not been fully established. For persons fully immunized with meningococcal C conjugate vaccine, revaccination is not thought to be necessary at this time, although there are insufficient data to predict persistence of immunologic memory (and presumed protection) beyond 5 years. This recommendation may be revised in the future; further research is warranted. Readers are referred to the most recent NACI meningococcal vaccine recommendations for further information[33,46,47].

APPENDIX 1:

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REFERENCES

1. Health Canada. *Guidelines for control of meningococcal disease*. CCDR 1994;20(3):17-27.
2. Squires SG, Deeks SL, Tsang RSW. *Enhanced surveillance of invasive meningococcal disease in Canada, 1 January, 1999, through 31 December, 2001*. CCDR 2004;30(3):17-28.
3. Whalen CM, Hockin JC, Ryan A, et al. *The changing epidemiology of invasive meningococcal disease in Canada, 1985 through 1992. Emergence of a virulent clone of Neisseria meningitidis*. JAMA 1995;273:390-94.
4. Deeks S, Kertesz D, Ryan A et al. *Surveillance of invasive meningococcal disease in Canada, 1995-1996*. CCDR 1997;23(16):121-25.
5. Squires SG, Pelletier L, Mungai M et al. *Invasive meningococcal disease in Canada, 1 January, 1997, to 31 December, 1998*. CCDR 2000;26(21):177-82.
6. Varughese PV, Carter AO. *Meningococcal disease in Canada. Surveillance summary to 1987*. CCDR 1989;15(17):89-96.
7. Ashton FE, Ryan JA, Borczyk A et al. *Emergence of a virulent clone of Neisseria meningitidis serotype 2a that is associated with meningococcal serogroup C disease in Canada*. J Clin Microbiol 1991;29:2489-93.
8. Ragunathan L, Ramsay M, Borrow R et al. *Clinical features, laboratory findings and management of meningococcal meningitis in England and Wales: report of a 1997 survey*. *Meningococcal meningitis: 1997 survey report*. J Infect 2000;40:74-9.
9. De Wals P, Hertoghe L, Borlée-Grimée I et al. *Meningococcal disease in Belgium. Secondary attack rate among household, day-care nursery and pre-elementary school contacts*. J Infect 1981;3(suppl 1):53-61.
10. Meningococcal Disease Surveillance Group. *Meningococcal disease: secondary attack rate and chemoprophylaxis in the United States, 1974*. JAMA 1976;235:261-65.
11. Cooke RPD, Riordan T, Jones DM et al. *Secondary cases of meningococcal infection among close family and household contacts in England and Wales, 1985–1987*. Br Med J 1989;298:555-58.
12. Hastings L, Stuart J, Andrews N et al. *A retrospective survey of clusters of meningococcal disease in England and Wales, 1993 to 1995: estimated risks of further cases in household and educational setting.* Commun Dis Rep 1997;7(13):R195-R200.
13. Kaiser AB, Hennekens CH, Saslaw MS et al. *Seroepidemiology and chemoprophylaxis of disease due to sulfonamide-resistant Neisseria meningitidis in a civilian population*. J Infect Dis 1974;130:217-24.
14. Jacobson JA, Camargos PAM, Ferreira JT et al. *The risk of meningitis among classroom contacts during an epidemic of meningococcal disease*. Am J Epidemiol 1976;104:552-55.
15. Feigin RD, Baker CJ, Herwaldt L et al. *Epidemic meningococcal disease in an elementary-school classroom*. N Engl J Med 1982;307:1255-57.
16. Hudson PJ, Vogt RL, Heun EM et al. *Evidence for school transmission of Neisseria meningitidis during a Vermont outbreak*. Pediatr Infect Dis J 1986;5:213-17.
17. Pollard AJ, Begg N. *Meningococcal disease and healthcare workers* [Editorial]. Br Med J 1999;319:1147-48.
18. Gehanno J-F, Kohen-Couderc L, Lemeland J-F et al. *Nosocomial meningococcaemia in a physician.* Infect Control Hosp Epidemiol 1999;20:564-65.
19. Centers for Disease Control and Prevention. *Immunization of health-care workers: recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC)*. MMWR 1997;46(RR18):1-42.

20. Stroffolini T, Rosmini F, Curiano CM. *A one year survey of meningococcal disease in Italy*. Eur J Epidemiol 1987;3:399-403.

21. Olivares R, Hubert B. *Clusters of meningococcal disease in France (1987-1988)*. Eur J Epidemiol 1992;8:737-42.

22. Almog R, Block C, Gdalevich M et al. *First recorded outbreaks of meningococcal disease in the Israel Defence Force: three clusters due to serogroup C and the emergence of resistance to rifampicin.* Infection 1994;22:69-71.

23. Samuelsson S, Hansen ET, Osler M et al. *Prevention of secondary cases of meningococcal disease in Denmark*. Epidemiol Infect 2000;124:433-40.

24. Dawson SJ, Fey RE, McNulty CA. *Meningococcal disease in siblings caused by rifampicin sensitive and rifampicin resistant strains.* Commun Dis Public Health 1999;2:215-16.

25. Guiver M, Borrow R, Marsh J et al. *Evaluation of the Applied Biosystems automated Taqman polymerase chain reaction system for the detection of meningococcal DNA.* FEMS Immunol Med Microbiol 2000;28:173-79.

26. Newcombe J, Cartwright K, Palmer WH et al. *PCR of peripheral blood for diagnosis of meningococcal disease*. J Clin Microbiol 1996;34:1637-40.

27. Carrol ED, Thomson AP, Shears P et al. *Performance characteristics of the polymerase chain reaction assay to confirm clinical meningococcal disease.* Arch Dis Child 2000;83:271-73.

28. British Columbia Ministry of Health. *Communicable disease control: invasive meningococcal disease*. January 2001.

29. Purcell B, Samuelsson S, Hahne SJM et al. *Effectiveness of antibiotics in preventing meningococcal disease after a case: systematic review.* Br Med J 2004;328:1339-42.

30. Communicable Diseases Network Australia. *Guidelines for the early clinical and public health management of meningococcal disease in Australia.* Commonwealth of Australia, 2001. ISBN 0 642 50308 7.

31. Stuart JM, Gilmore AB, Ross A et al. *Preventing secondary meningococcal disease in health care workers: recommendations of a working group of the PHLS Meningococcus Forum*. Communic Dis Pub Health 2001;4(2):102-05.

32. Public Health Laboratory Service Meningococcus Forum. *Guidelines for public health management of meningococcal disease in the UK.* Commun Dis Public Health. 2002;5(3):187-204.

33. National Advisory Committee on Immunization. *Statement on recommended use of meningococcal vaccines.* CCDR 2001;27(ACS-6):2-36.

34. Healing TD, Hoffman PN, Young SEJ. *The infection hazards of human cadavers*. Communic Dis Rep CDC Rev 1995;5:R61-R68.

35. Health Canada. *Infection Control Guidelines – Routine practices and additional precautions for preventing the transmission of infection in health care.* CCDR 1999;25(S4):1-142.

36. Centers for Disease Control and Prevention. *Exposure to patients with meningococcal disease on aircrafts – United States 1999-2001.* MMWR 2001;50(23):485-89.

37. Kenyon TA, Valway SE, Ihle WW et al. *Transmission of multidrug-resistant Mycobacterium tuberculosis during a long airplane flight*. N Engl J Med 1996;334:933-38.

38. Kristiansen B-E, Knapsbog A-B. *Secondary prevention of meningococcal disease.* Br Med J 1996;312:591-92.

39. DeWals P. *Notice concerning the use of a vaccine to control an outbreak of invasive meningococcal infections*. On behalf of the Advisory Committee to the ministère de la santé et des Services Sociaux du Québec, 2001.

40. Centers for Disease Control and Prevention. *Meningococcal disease and college students.* MMWR 2000;49(RR07):11-20.

41. Schwartz B. *Chemoprophylaxis for bacterial infections: principles of an application to meningococcal infections*. Rev Infect Dis 1991;13(suppl 2):S170-S173.

42. Judson FN, Ehret JM. *Single-dose ceftriaxone to eradicate pharyngeal Neisseria meningitidis.* Lancet 1984;2:462-1463.

43. Schwartz B, Al-Tobaiqi A, Al-Ruwais A et al. *Comparative efficacy of ceftriaxone and rifampin in eradicating pharyngeal carriage of group A Neisseria meningitidis.* Lancet 1988;1:1239-42.

44. Girgis N, Sultan Y, Frenck RW, El-Gendy A et al. *Azithromycin compared with rifampin for eradication of nasopharyngeal colonization of Neisseria meningitidis.* Pediatric Infect Dis J 1998;17:816-9.

45. Gonzalez de Aledo LA, Garcia MJ. *Control of a school outbreak of serogroup B meningococcal disease by chemoprophylaxis with azithromycin and ciprofloxacin.* An Esp Pediatr 2000;53(5):412-17.

46. National Advisory Committee on Immunization. *Supplementary statement on conjugate meningococcal vaccines*. CCDR 2003;29(ACS-6):10-11.

47. Health Canada. *Meningococcal vaccine*. In: *Canadian immunization guide*, 6th edition. Ottawa: Health Canada, 2002;151-65. Cat. H49-8/2002E.

48. Granoff DM, Gupta RK, Belshe RB et al. *Induction of immunologic refractoriness in adults by meningococcal C polysaccharide vaccination*. J Infect Dis 1988;178:870-74.

49. Richmond P, Kaczmarski E, Borrow R et al. *Meningococcal C polysaccharide vaccine induces immunologic hyporesponsiveness in adults that is overcome by meningococcal C conjugate vaccine.* J Infect Dis 2000;181:761-64.

50. MacLennan J, Obaro S, Deeks J et al. *Immunologic memory 5 years after meningococcal A/C conjugate vaccination in infancy*. J Infect Dis 2001;183:97-104.

9.4.1 Invasive Pneumococcal Disease (IPD)

Special Precautions/Considerations

Precautions: Droplet

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	*Streptococcus pneumoniae* (*S. pneumoniae*), also known as pneumococcus, is a Gram-positive encapsulated coccus, of which 90 serotypes are known to cause disease.
Clinical	
Clinical Presentation	In children, Invasive Pneumococcal Disease (IPD) usually occurs as bacteremia without a clinical focus, pneumonia and meningitis. In adults, IPD most commonly presents as bacteremia, pneumonia, meningitis and other clinical manifestations such as endocarditis or septic arthritis. Symptoms of pneumonia in infants and young children may not be specific and may include fever, cough, rapid breathing and grunting. In adults, symptoms may include sudden onset with fever, pleural pain, difficulty or rapid breathing, productive cough or rusty sputum. Meningitis due to IPD in persons over 2 years of age presents with fever, stiff neck and headache, which can develop over several hours or 1 to 2 days. Other symptoms can include nausea, vomiting, photophobia, confusion and lethargy. In children under 2 years of age, the above symptoms may be absent, but they may present with irritability, poor feeding, vomiting, lethargy, and high-pitched cry. Otitis media, sinusitis and bronchitis are non-invasive and less severe manifestations of pneumococcal infection but are considerably more common. **Only invasive disease is reportable.** *S. pneumoniae* may also colonize the lining of the nose or throat of individuals (carriers) without symptoms and may be passed from person to person.
Diagnostics	Laboratory criteria for diagnosis of IPD require the isolation of *S. pneumoniae* by culture from a normally sterile site (e.g. blood or cerebrospinal fluid or, less commonly, joint, pleural or pericardial fluid). Follow your regional laboratory procedures for serologic testing.
Treatment	Antibiotic resistant pneumococci strains have become more common, therefore identification of the strain is important. Individuals suspected of having IPD should be treated promptly, empiric antimicrobial therapy may be required.
Pathogen	
Occurrence	**Worldwide:** Most *S. pneumoniae* serotypes have been shown to cause serious disease, but only a few serotypes produce the majority of pneumococcal infections. The 10 most common serotypes account for approximately two-thirds of invasive disease worldwide. Over 90% of all pneumococcal infections are caused by 23 strains. Pneumococcal infections are most common during the winter and spring months. **Canada:** The overall incidence of IPD is not known; it is estimated that there are approximately 500,000 cases of pneumococcal disease each year. *S. pneumoniae* is the leading cause of invasive bacterial infections in children including bacteremia, septicemia, pneumonia, and meningitis. Children less than

	five years, especially those less than two years, and the elderly have the highest incidence. Aboriginal children living in northern Canada have a three times higher incidence rate than non-Aboriginals. **Nunavut:** From 1999–2011 there have been 99 reported cases, with an annual average rate of 26.0 cases per 100,000. Approximately 70% of cases were male, with the majority of reported cases in Baffin Region.
Reservoir	Humans. Pneumococci are commonly found in the upper respiratory tract of healthy people.
Transmission	By droplet spread or direct oral contact, or indirectly via articles contaminated with respiratory secretions. Person-to-person transmission is common, but illness among casual contacts is infrequent.
Incubation Period	May be as short as 1 to 3 days.
Communicability	Presumably until discharges from nose and mouth no longer contain virulent pneumococci in significant numbers. Appropriate antibiotic treatment will end communicability within 24 to 48 hours.
Susceptibility and Resistance	Any process that affects the anatomic or physiologic integrity of the lower respiratory tract (e.g. influenza, pulmonary edema, chronic lung disease, etc.) increases the individual's susceptibility to symptomatic pneumococcal infection. Individuals most susceptible to serious and invasive pneumococcal infections are typically those with chronic medical conditions including: • Chronic cerebral spinal fluid (CSF) leak; • Chronic neurologic condition that may impair clearance of oral secretions; • Cochlear implants (including those children who are to receive implants); • Chronic cardiac or pulmonary disease; • Diabetes mellitus; • Asplenia (functional or anatomic); • Sickle cell disease or other hemoglobinopathies; • Congenital immunodeficiencies involving any part of the immune system, including B-lymphocyte (humoral) immunity, T-lymphocyte (cell) mediated immunity, complement system (properdin, or factor D deficiencies), or phagocytic functions; • Hematopoietic stem cell transplant (recipient); • HIV infection; • Immunosuppressive therapy including use of long term corticosteroids, chemotherapy, radiation therapy, post-organ transplant therapy, and certain anti-rheumatic drugs; • Chronic kidney disease, including nephrotic syndrome; • Chronic liver disease (including hepatic cirrhosis due to any cause); • Malignant neoplasms including leukemia and lymphoma; • Solid organ or islet transplant (candidate or recipient). There is also an increased risk of invasive disease when adults are in contact with young children as children are more likely to be colonized. Infection generally confers immunity to the specific serotype. This immunity may last for years.

Public Health Management	
Case	Contact and interview the case. In situations where the case is too ill to be interviewed, information should be obtained from family, health care providers, etc. Complete the *Bacterial Disease Surveillance Form – Streptococcus pneumoniae* dated February 2011 or later (section 9.4.2). Provide education about the infection and ways to prevent spread.
Contacts	No special management required unless in the setting of an institutional outbreak.
Outbreaks	If a higher than normal amount of disease activity is detected, contact your Regional Communicable Disease Coordinator (RCDC).
Health Education	• Promote immunization with pneumococcal vaccine as per the current Nunavut immunization policy. • Certain risk factors or chronic conditions put children and adults at an increased risk of acquiring IPD. Individuals with risk factors should be assessed for eligibility under the publicly funded program for both pneumococcal conjugate and/or pneumococcal polysaccharide vaccine (as per the current Nunavut immunization policy). • Educate health care providers about the risks of pneumococcal disease for individuals with specific underlying medical conditions and others identified as at risk.
Health Settings Management	
Infection Control Measures in Health Care Settings	Droplet precautions.
Occupational Health	Procedure mask if within 1 metre. Gown and gloves if risk of contamination with respiratory secretions.
Surveillance	
Case Definition	**Confirmed case:** Clinical evidence* of invasive disease with laboratory confirmation of infection: • Isolation of *Streptococcus pneumoniae* from a normally sterile site (blood, CSF, joint, pleural or pericardial fluid), excluding the middle ear or pleural cavity **OR** • Demonstration of *S. pneumoniae* DNA from a normally sterile site (excluding the middle ear and pleural cavity) **Probable case:** Clinical evidence* of invasive disease with no other apparent cause and with non-confirmatory laboratory evidence: • Demonstration of *S. pneumoniae* antigen from a normally sterile site (excluding the middle ear and pleural cavity) ***Clinical evidence:** Clinical illness associated with invasive disease manifests itself mainly as pneumonia with bacteremia, bacteremia without a known site of infection, and meningitis. Pneumonia without bacteremia is not notifiable.

Reporting Requirements and Forms	**IPD is a notifiable infection in Nunavut:** 1. Complete the *Bacterial Disease Surveillance Form – Streptococcus pneumoniae* dated February 2011 or later (section 9.4.2). 2. Fax the form, within 7 days of case notification, to the RCDC as follows: • Qikiqtaaluk: 867-975-4833 • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 3. If you cannot contact your RCDC, contact the TCDC at: 867-975-5734.

Tools

Guidelines	None
Materials & Resources	**Fact Sheet: Pneumococcal Disease**
Cross Reference	Nunavut Immunization Manual: Pneumococcal Immunization protocol

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Pneumococcal-Disease-Invasive-IPD-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on August 6, 2013.

9.5.1 Legionellosis

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	*Legionella* are gram-negative bacilli. The bacteria survive for months in tap or distilled water but are susceptible to many disinfectants, moist heat, and dry heat. There are at least 35 species of *Legionella*, but *Legionella pneumophila* (*L. pneumophila)* serogroups 1, 4, and 6 are responsible for more than 90% of clinical disease in humans.
Clinical	
Clinical Presentation	There are two distinct clinical and epidemiological manifestations of Legionellosis: Legionnaire's Disease and Pontiac Fever. The early symptoms of both diseases include anorexia, malaise, myalgia, headache and rapidly rising fever with chills (temperatures commonly reach 39ºC to 40.5ºC). Non-productive cough, abdominal pain and diarrhea are common. For Legionnaire's Disease, chest x-rays often show pneumonia that may progress to bilateral involvement and ultimately respiratory failure. Case fatality rates for Legionnaire's Disease have reached as high as 15%. Pontiac fever is a milder illness, which is not associated with pneumonia or death. Clients with Pontiac fever usually recover spontaneously in 2–5 days.
Diagnostics	The diagnosis of Legionellosis can be made by isolation of the organism from respiratory secretions or from a normally sterile site, seroconversion, a fourfold increase in antibody levels (≥ 1:128), or positive urinary antigen (for *L. pneumophila*). Urinary antigen testing is the most rapid and sensitive test but only detects infection with *L. pneumophila.* Samples may not show test positivity for up to five days after the start of symptoms. Testing may need to be repeated if the specimen is taken early in the illness. Serology testing to demonstrate recent infection requires two samples taken 3–6 weeks apart to show a fourfold rise in titre. Follow your regional laboratory procedures for testing.
Treatment	Legionnaire's Disease is treatable with antibiotics. Consult a physician regarding treatment recommendations. Cases with Pontiac fever generally recover spontaneously in 2–5 days without treatment.
Pathogen	
Occurrence	**Worldwide**: The earliest documented case of Legionellosis occurred in 1947 and the first documented outbreak in Minnesota in 1957. The *Legionella* bacterium was first identified in 1976 when 34 members of the American Legion died following a conference in Philadelphia. Cases have been reported in Canada, the US, Europe, Australia, Africa and South America. Most cases are sporadic, however, when outbreaks occur it is most often with low attack rates (0.1–5%) in the population at risk. Legionellosis, where prevalent, causes 2–15% of all community-acquired pneumonia. The case fatality rate ranges from 3–5%.

	Canada: Cases have been reported in Canada since 1986. In general, the majority of reported cases of Legionnaires' Disease are sporadic. The reported rate from 1989 to 1999 has been approximately 0.34 cases per 100,000. In 2005, an outbreak of Legionnaire's Disease in a Toronto nursing home was responsible for 20 deaths among 127 infected residents and workers. **Nunavut**: There have been no reported cases in Nunavut.
Reservoir	The organism is ubiquitous in nature, particularly in aquatic environments. Outbreaks and sporadic cases have been linked to air conditioning cooling towers, evaporative condensers, humidifiers (including household humidifiers), whirlpool spas, respiratory therapy devices, decorative fountains and potable water systems.
Transmission	*Legionella* are opportunistic pathogens with widespread distribution in the environment but cause a very low rate of infection in the general population. It is most commonly associated with water-droplet transmission from cooling towers. *Legionella* are transmitted directly from the environment to humans with the most common source thought to be aerosolization of water containing *L. pneumophila*. The organism can survive for years in water at 2-8°C and is resistant to usual levels of chlorination.
Incubation Period	The incubation period for Legionnaire's Disease is 2–10 days, most often 5–6 days. Pontiac fever has a much shorter incubation period with a range of 5–66 hours, most often 24–48 hours.
Communicability	Person-to-person transmission has not been documented.
Susceptibility and Resistance	Illness occurs most frequently with increasing age. Persons who smoke, have diabetes, lung or renal disease are at highest risk. The disease is rare in persons under 20 years of age. Outbreaks have occurred among institutionalized patients/residents.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 9.5.2). Ensure the case is asked about the following exposures: • History of travel, including dates and location(s). • History of exposure to air conditioners, humidifiers, water fountains or spas and other high risk areas during the 10 days prior to illness. • Any risk factors such as smoking or medical conditions. • Occupation. • Residency or attendance at a facility or institution.
Contacts	No follow-up is required; person-to-person transmission of Legionellosis has not been documented.
Outbreaks	Contact your Regional Communicable Disease Coordinator (RCDC) if even a single case is reported.
Health Education	Avoid exposure to aerosolized contaminated water.
Health Settings Management	
Infection Control Measures in	Routine.

Health Care Settings	
Occupational Health	

Surveillance

Case Definition	**Confirmed case:** Clinical illness* with laboratory confirmation of infection: • Isolation of *Legionella* species or detection of the antigen from respiratory secretions, lung tissue, pleural fluid or other normally sterile fluids **OR** • A significant (e.g. fourfold or greater) rise in *Legionella* species IgG titre between acute and convalescent sera **OR** • IgG titre >1:128 against *Legionella* species **OR** • Demonstration of *L. pneumophila* antigen in urine. **Probable case:** Clinical illness* with demonstration of Legionella species DNA. ***Clinical illness:** Legionellosis comprises two distinct illnesses: Legionnaires' Disease, characterized by fever, myalgia, cough and pneumonia, and Pontiac fever, a milder illness without pneumonia.
Reporting Requirements and Forms	**Legionellosis is a notifiable infection in Nunavut:** 1. Notify your RCDC. 2. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 9.5.2). 3. Fax the form, within 24 hours of case notification, to the RCDC as follows: • Qikiqtaaluk: 867-975-4833 • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 4. If you cannot contact your RCDC, contact the TCDC at: 867-975-5734.

Tools

Guidelines	None
Materials & Resources	**Fact Sheet: Legionellosis**
Cross Reference	Not applicable

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Legionellosis-2011.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Nova Scotia Communicable Diseases Manual. Available online at http://www.gov.ns.ca/hpp/publications/cdc_manual.pdf

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on August 9, 2013.

9.6.1 Leprosy

Special Precautions/Considerations

Precautions: Contact

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	*Mycobacterium leprae (M. leprae)* is the bacterium which causes leprosy. It is an obligate intracellular, acid-fast bacillus that can be Gram-stain variable.
Clinical	
Clinical Presentation	A chronic bacterial disease characterized by the involvement primarily of skin as well as peripheral nerves and the mucosa of the upper airway. Clinical forms of the disease represent a spectrum reflecting the cellular immune response to *M. leprae.* The following characteristics are typical of the major forms: (1) **Tuberculoid**: one or a few well-demarcated, hypopigmented and anesthetic skin lesions, frequently with active spreading edges and a clearing centre; peripheral nerve swelling or thickening also may occur. (2) **Lepromatous**: a number of erythematous papules and nodules or an infiltration of the face, hands and feet with lesions in a bilateral and symmetrical distribution that progress to thickening of the skin. (3) **Borderline (dimorphous)**: skin lesions characteristic of both the tuberculoid and lepromatous forms. (4) **Indeterminate**: early lesions, usually hypopigmented macules, without developed tuberculoid or lepromatous features.
Diagnostics	Consult your local laboratory.
Treatment	Consult with physician.
Pathogen	
Occurrence	**Worldwide:** More common in tropical and subtropical areas. India, Indonesia, and Burma account for 70% of all cases in the world. It is estimated that there are 1-2 million people worldwide who have leprosy. **Canada:** Rare. **Nunavut:** No reported cases.
Reservoir	Humans are thought to be the only reservoir of proven significance.
Transmission	The mode of transmission remains unclear but it is not highly communicable. Likely transmitted from nasal mucosa of an infected person to the skin and respiratory tract of another person via droplets, from the nose and mouth, during close and frequent contact with untreated cases.
Incubation Period	9 months to 20 years with the average incubation period approximately 4 years for tuberculoid leprosy and 8 years for lepramotous leprosy.
Communicability	Clinical and laboratory evidence suggest that infectiousness is lost in most instances within a day of treatment with multidrug therapy.
Susceptibility and Resistance	Infection among close contacts of cases is frequent, however clinical disease occurs only in a small proportion of those infected. The form of leprosy depends on the ability to develop cell-mediated immunity.
Public Health Management	
Case	Contact the Regional Communicable Disease Coordinator (RCDC) if during regular business hours, or the Medical Officer of Health (MOH) on call if after regular business hours.

Contacts	Contact RCDC if during regular business hours, or the MOH on call if after regular business hours.
Outbreaks	Contact RCDC if during regular business hours, or the MOH on call if after regular business hours.
Health Education	Not applicable

Health Settings Management

Infection Control Measures in Health Care Settings	Direct Contact
Occupational Health	

Surveillance

Case Definition	**Confirmed** Clinical evidence of illness with laboratory confirmation: • positive acid fast stain with typical morphology for *Mycobacterium leprae* **OR** • histopathological report from skin or nerve biopsy compatible with leprosy. **Probable** Clinical illness in a person who is epidemiologically linked to a confirmed case.
Reporting Requirements and Forms	**This is a notifiable infection in Nunavut:** 1. Complete the *Communicable Disease Report Form* dated February 2013 or later (section 9.6.2). 2. Fax the form, within 7 days of case notification, to the RCDC as follows: • Baffin: 867-975-4833 • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 3. If you cannot contact your RCDC, contact the TCDC at: 867-975-5734.

Tools

Guidelines	None
Materials & Resources	None
Cross Reference	Not applicable

References

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Public Health Agency of Canada. Notifiable Diseases Online: Leprosy, 2003. Available online at: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/lepr-eng.php

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on August 9, 2013.

9.7.1 Respiratory Syncytial Virus (RSV)

Special Precautions/Considerations

Precautions: Droplet

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Respiratory syncytial virus (RSV) is an enveloped, non-segmented RNA virus. The two major strains of RSV (groups A and B), each of which have numerous identified genotypes, often circulate concurrently.
Clinical	
Clinical Presentation	While RSV can cause acute illness at any age, in infants and young children it is a major cause of bronchiolitis and pneumonia. • Most RSV begins with nasal congestion, upper respiratory tract infection and may include a low-grade fever. Classic presentation is bronchiolitis with diffuse wheezing, cough, difficulty breathing, lung hyperinflation and trouble feeding. • For newborns and preterm infants respiratory signs can begin with periods of apnea over a few days, especially under 6 months of age. • For older children and adults illness generally manifests as upper respiratory illness and exacerbation of underlying lung conditions.
Diagnostics	The specimen of choice is the nasopharyngeal (NP) swab (See 9.7.3 for NP swab procedure). When RSV is first suspected in the community, take a NP swab for up to 5 patients in a variety of age groups over a few days. (Note that the use of point of care rapid tests is restricted to admitted patients for infection control purposes.)
Treatment	As per physician direction.
Pathogen	
Occurrence	**Worldwide:** RSV is the most common cause of bronchiolitis and pneumonia in children under 1 year worldwide. In the northern hemisphere, epidemics peak February to March and can last up to 5 months, however timing varies by location and year. **Canada:** 10% of respiratory-related hospital admissions in children can be attributed to RSV infection, the highest rate is in infants under 6 months. RSV is not a nationally notifiable disease thus complete national data is not available. Based on the laboratory network data available RSV activity generally starts in late fall, peaking in early winter and tapering into late spring. **Nunavut:** There are sporadic cases throughout the year with activity peaking January to the end of May, from 2008-2012 there were between 93-168 reported cases per year. There is no consistent regional trend from 2008-2012 except activity generally appears to begin in Qikiqtaaluk region.
Reservoir	Humans
Transmission	Contact with infected droplets or indirectly by hands or freshly contaminated articles. Risk factors include: living in crowded conditions, day care attendance and older siblings in school.

Incubation Period	Ranges from 2 to 8 days; 4 to 6 days is most common.
Communicability	Shortly prior to and for the duration of active disease. In infants, RSV shedding may very rarely persist up to four weeks after clinical symptoms subside.
Susceptibility and Resistance	Susceptibility is universal. Illness is more frequent and more severe in infants, children and the elderly. Infection induces specific antibodies that are usually short-lived. Re-infection with RSV and parainfluenza viruses is common, but illness is generally milder. Illness severity is affected by conditions such as: age (under 3 months), prematurity, tobacco smoke exposure, congenital heart disease, underlying pulmonary disease, immunodeficiency, immunosuppression, lack of breastfeeding.
Public Health Management	
Case	At this time individual cases do not require public health follow up.
Contacts	Contact management of community cases is not necessary.
Outbreaks	For Nunavut purposes an RSV outbreak is defined as: • A single laboratory confirmed RSV case **AND** • Community clinics reporting above expected levels of a respiratory illness in infants that is clinically compatible with RSV.
Prevention Messaging	Prophylaxis of eligible children is effective in preventing illness and reducing the impact of disease. Synagis® (Palivizumab) is an antibody available for RSV prevention. Refer to the Synagis® Immunization Program section of the Nunavut Immunization Manual for details. **Note: Synagis provides passive immunity, thus missed doses leave patients unprotected. Evidence suggests Synagis compliance in Nunavut has been sub-optimal, thus further encouragement should be provided to adhere to the schedule.** Basic personal hygiene is also important in reducing transmission, e.g. covering nose and mouth when coughing or sneezing and regular hand hygiene. Also breastfeeding if possible, avoiding crowded places when there is respiratory illness in the community, and avoiding exposure to tobacco smoke is important to preventing viral transmission. Advise parents or caregivers of children who are ill to stay away from common settings like daycare or school to limit exposure to others, especially those at high risk for complications, until they are feeling well.
Health Settings Management	
Infection Control Measures in Health Care Settings	Use routine practices and droplet/contact precautions. When triaging, suspect RSV cases should be placed in a separate room away from other patients as soon as possible or separated by at least two meters from other people waiting if it is not possible to use another room. Individuals suspected to have RSV should be instructed to put on a surgical/procedural mask (with ear loops) while they are in the clinic, if tolerated. This is not applicable to children. Diligent hand hygiene using either liquid soap and water or 60-90% alcohol-based sanitizer, before **and** after patient contact/assessment and after contact with contaminated equipment.

	Follow standard cleaning and disinfecting procedures for rooms and equipment.
Occupational Health	Staff should wear a surgical/procedural mask and eye protection when in close contact with the secretions of infected patients (within 2 meters). Staff providing clinical care to these patients should also wear gloves and gown/apron, as surfaces may be contaminated with infectious droplets.
Surveillance	
Case Definition	Clinically compatible illness **AND** • Isolation of RSV respiratory secretions in cell culture **OR** • Identification of viral antigen in nasopharyngeal cells by polymerase chain reaction (PCR) or enzyme immunoassay (EIA) **OR** • Significant rise (e.g. ≥ fourfold) in RSV antibody titre between acute and convalescent sera
Reporting Requirements and Forms	RSV is reportable in Nunavut. Surveillance includes laboratory-confirmed RSV, hospitalized cases and weekly reporting of respiratory illness for the time period specified by the office of the Chief Medical Officer of Health (CMOH). Report respiratory illness outbreaks, or any incident of viral respiratory illness causing death to Regional Communicable Disease Coordinator (RCDC) immediately who will report these to the Office of the CMOH. Viral Respiratory Illness Surveillance is conducted in the communities (e.g. Community Health Centres, Public Health, and Qikiqtani General Hospital) each week during the respiratory virus season. This provides information that can detect outbreaks of respiratory viruses early and can be used to guide prevention and control activities. 1. A fax will be sent from the RCDC **each Monday** during the respiratory virus season (time period will vary every year and be specified by the CMOH) that contains questions related to suspect viral respiratory illness activity in the community for the past week (Sunday to Saturday). 2. All questions must be answered and faxed back to the RCDC **every Wednesday.** 3. RCDCs must collate the information for their region and forward to the office of the CMOH **every Thursday by noon.**
Tools	
Guidelines	
Materials & Resources	Nasopharyngeal Swab Procedure **Fact Sheet: Respiratory Syncytial Virus** Public Health Agency of Canada. FluWatch. Website: http://www.phac-aspc.gc.ca/fluwatch/index-eng.php Public Health Agency of Canada. RSV: Pathogen safety data sheet (2011). Website: http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/pneumovirus-eng.php
Cross Reference	Nunavut Immunization Manual: Synagis® Protocol section

References

Beers, MH; Porter, RS; Jones, TV; Kaplan, JL & Berkwits, M. (Eds). The Merck Manual of Diagnosis and Therapy, 18th Edition. 2006, Merck Research Laboratories, Whitehouse Station NJ.

Hay, WW; Levin, MJ; Sondheimer, JM; & Deterding, RR (Eds). Current Diagnosis & Treatment Pediatrics 19th Ed. 2009, McGraw Hill Medical, New York

Heymann D., editor. Control of communicable diseases manual. 19th ed. Washington: American Public Health Association; 2008.

McPhee, SJ & Papadakis (Eds) 2009 Current Medical diagnosis & Treatment. 2009, McGraw Hill /Lang, San Francisco.

Public Health Agency of Canada. Canadian Immunization Guide – Seventh Edition (2006). Available online at: http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php

Approval

Approved by Dr. Kim Barker, Chief Medical Officer of Health on May 31, 2016.

9.8.1 Severe Acute Respiratory Syndrome (SARS)

Special Precautions/Considerations

Precautions: Droplet, direct and indirect precautions

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Severe Acute Respiratory Syndrome (SARS) is caused by a coronavirus similar on electron microscopy to animal coronaviruses. Coronaviruses are large, enveloped RNA viruses.
Clinical	
Clinical Presentation	SARS illness generally presents with malaise, myalgia and fever, quickly followed by respiratory symptoms including cough and shortness of breath. Diarrhea may occur. Symptoms may worsen for several days coinciding with viraemia at 10 days after onset. Nearly all confirmed infected adult cases developed pneumonia or acute respiratory distress syndrome.
Diagnostics	Consult your local laboratory.
Treatment	Consult with physician.
Pathogen	
Occurrence	**Worldwide:** First recognized in February 2003, the disease is thought to have originated in the Guangdong province of China, with emergence into human populations sometime in November 2002. By July 2003, major outbreaks had occurred at 6 sites, with disease occurrence reported in more than 20 additional sites throughout the world, following major airline routes. Most cases occurred in hospitals and among families and close contacts of hospital workers. There have been no cases of SARS identified since the 2003 outbreaks. **Canada:** The first case of SARS was detected in Toronto, which was the epicenter of the outbreak in Canada. In all, there were 251 cases of SARS diagnosed in Canada, mostly in the Toronto area; 43 patients died. **Nunavut:** No reported cases.
Reservoir	Unknown.
Transmission	SARS is transmitted from person-to-person by close contact (i.e. within 1 or 2 meters); caring for, living with, or direct contact with infectious respiratory secretions or body fluids of a suspected, or confirmed case of SARS. The virus is thought to be transmitted most readily through respiratory droplets and possibly fomites (a surface or object contaminated with infectious droplets).
Incubation Period	3–10 days.
Communicability	Not yet completely understood. Initial studies suggest that transmission does not occur before onset of clinical signs and symptoms, and that maximum period of communicability is less than 21 days. During the 2003 outbreak, health workers were at great risk of disease acquisition, especially when exposed to aerosol-generating procedures such as intubations. In 2003, health care workers served as an entry point of the disease into the community in North America.
Susceptibility and Resistance	Unknown but susceptibility is assumed to be universal. At present race and sex do not appear to alter susceptibility. Because of the small number of cases

	reported among children, it has not been possible to assess the influence of age. The clinical course appears to be much milder and shorter among cases less than 12 years of age.
Public Health Management	
Case	Contact Regional Communicable Disease Coordinator (RCDC) if during regular business hours, or the Medical Officer of Health (MOH) on call if after regular business hours.
Contacts	Contact RCDC if during regular business hours, or the MOH on call if after regular business hours.
Outbreaks	Contact RCDC if during regular business hours, or the MOH on call if after regular business hours.
Health Education	Not applicable
Health Settings Management	
Infection Control Measures in Health Care Settings	Droplet, direct and indirect precautions.
Occupational Health	Procedure masks if within 2 metres of patient. N95 respirators should also be worn for aerosol-generating procedures. Gown and gloves if there is a risk of coming in contact with secretions.
Surveillance	
Case Definition	**Confirmed case** Laboratory evidence of SARS-associated coronavirus (SARS-CoV) infection, **AND**: • Early presentation of clinically compatible signs and symptoms of SARS **AND** • Radiographic evidence consistent with SARS, **OR** A deceased person with: • A history of early presentation of clinically compatible signs and symptoms of SARS (i.e. fever **AND** cough **OR** difficulty breathing resulting in death) **AND** • Autopsy findings consistent with SARS, i.e.Evidence of pneumonia or Acute Respiratory Distress Syndrome (ARDS) without an alternate identifiable cause **AND** • Laboratory evidence of SARS coronavirus infection **Probable case** In the absence of laboratory evidence, a person with: • Early presentation of clinically compatible signs and symptoms of SARS **AND** Radiographic evidence consistent with SARS **AND** • An epidemiologic link to a person or place linked to SARS, including: ▪ Close contact with a confirmed SARS case, within 10 days of onset of symptoms **OR** ▪ Close contact with a symptomatic person who has laboratory evidence of SARS-CoV infection, within 10 days of onset of symptoms **OR** ▪ Residence, recent travel or visit to an “Area with recent local transmission of SARS” within the 10 days prior to onset of symptoms OR close contact (including health care providers) with a probable

	case who has been to an "Area with recent local transmission of SARS" within the 10 days prior to onset of symptoms **OR** ▪ Laboratory exposure to SARS-CoV 239 **OR** • A deceased person with: ▪ A history of early presentation of clinically compatible signs and symptoms of SARS **AND** ▪ Autopsy findings consistent with SARS **AND** ▪ An epidemiologic link to a person or place linked to SARS
Reporting Requirements and Forms	**This is a notifiable infection in Nunavut.** Contact your RCDC immediately if during regular business hours, or the MOH on call if after regular business hours.

Tools

Guidelines	None
Materials & Resources	None
Cross Reference	Not applicable

References

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on August 12, 2013.

10.0 Vectorborne and Zoonotic Infections

Purpose

The purpose of this section of the Communicable Disease Manual is to provide guidelines for the investigation and management of individuals who have been diagnosed with notifiable infections spread by vectorborne and zoonotic routes, including Anthrax, Brucellosis, Hantavirus, Lyme disease, Malaria, Plague, Rabies, Tularemia, West Nile Virus, and Yellow Fever.

Legislation/Policy

Authority for the reporting of notifiable infections spread by vectorborne and zoonotic routes and their public health management comes from the *Public Health Act, Communicable Disease Regulations*.

All clients who have been diagnosed with notifiable infections spread by vectorborne and zoonotic routes must be reported to the Chief Medical Officer of Health (CMOH).

All clients who are suspected to have or have a confirmed notifiable infection spread by vectorborne and zoonotic routes are to be followed as per the protocols in this section.

Roles and Responsibilities

Table 10.1: Roles and responsibilities for follow up of notifiable infections spread by vectorborne and zoonotic routes

Role	Responsibilities
Laboratory	• Report all laboratory confirmed notifiable infections spread by vectorborne and zoonotic routes to the CMOH or designate.
Health Care Provider team (Physician, Nurse Practitioner, Community Health Nurse, Licensed Practical Nurse, Public Health Nurse)	• Test all clients suspected to have a notifiable infection spread by vectorborne and zoonotic routes. • Treat all clients with a notifiable infection spread by vectorborne and zoonotic routes as appropriate. • Complete public health case and contact management (as applicable) of clients with a notifiable infection spread by vectorborne and zoonotic routes. • Complete the appropriate case report form(s) and send it to the Regional Communicable Disease Coordinator (RCDC) or Regional Environmental Health Officer as directed by the disease-specific protocol.
Regional Communicable Disease Coordinator or Regional Environmental Health Officer	• Provide advice on a regional basis for the case and contact management (as applicable) of notifiable infections spread by vectorborne and zoonotic routes. • Receive and review reports of notifiable infections spread by vectorborne and zoonotic routes. • Consult with the Territorial Communicable Disease Consultant or Territorial Environmental Health Specialist as required.
Territorial Communicable	• Provide advice on a territorial basis for the case and contact management (as applicable) of notifiable infections spread by

Disease Consultant or Territorial Environmental Health Specialist	vectorborne and zoonotic routes. • Ensure cases are included in the communicable disease information system.
Chief or Deputy Chief Medical Officer of Health	• Be available for consultation on notifiable infections spread by vectorborne and zoonotic routes. • Make program recommendations.

10.1.1 Anthrax

Special Precautions/Considerations

Precautions: Routine
*Contact if wound drainage cannot be contained by dressing

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Bacterium *Bacillus anthracis (B. anthracis),* an aerobic, Gram-positive, encapsulated, spore forming, nonmotile rod.
Clinical	
Clinical Presentation	Depending on the route of transmission of infection, there are four clinical syndromes: (1) **Cutaneous Anthrax**: Characterized by initial itching of exposed skin, an initial vesicle at the site of inoculation develops into a painless black eschar; fever, malaise and headache may be present. (2) **Inhalational Anthrax**: The most lethal form of disease. Initial presentation includes, sweats, malaise, mild cough, dyspnea, nausea or vomiting, and this is followed by acute onset of respiratory distress and shock; there is also radiological evidence of mediastinal widening and pleural effusion present. Fatality rate is extremely high. (3) **Anthrax meningitis**: Begins with hypotension, quickly followed by delirium or coma; refractory seizures, cranial nerve palsies, and myoclonus have been reported. (4) **Intestinal Anthrax:** Presents with acute vomiting, abdominal distension, gastrointestinal bleeding, and peritonitis. Symptoms of oropharyngeal Anthrax include fever, neck swelling due to lymphadenopathy, throat pain, oral ulcers and sepsis.
Diagnostics	Consult your regional laboratory.
Treatment	Consult with physician.
Pathogen	
Occurrence	**Worldwide:** Human Anthrax is endemic in regions where animal Anthrax is common like Africa, Asia, south and central America, south and east Europe. Anthrax is primarily a disease of herbivores, it is an occupational hazard primarily in those that process hides, hair/wool, bones or deal with infected animals. **Canada:** Rare. Cases have occurred from Alberta to western Ontario, with repeated animal outbreaks in the Mackenzie Bison Range in the Northwest Territories and in Wood Buffalo National Park in northern Alberta. **Nunavut:** No reported cases.
Reservoir	Animals (livestock and wildlife). Spores may remain dormant in soil potentially infecting animals.
Transmission	Transmission occurs by inoculation through open skin via contact with infected animal tissue, other animal products and contaminated soil and by ingestion of undercooked, contaminated or raw meat. Inhalation Anthrax results from the inhalation of anthrax spores, particularly in risky industrial settings.
Incubation Period	1-7 days (possibly up to 60 days)
Communicability	Person-to-person transmission is rare. Articles and soil contaminated with spores may remain infective for years.
Susceptibility	There is some evidence of inapparent infection among people in frequent

and Resistance	contact with the infectious agent; second attacks can occur, but reports are rare.
Public Health Management	
Case	Contact the Environmental Health Officer (EHO) or Medical Officer of Health (MOH) on call.
Contacts	Contact EHO or MOH on call.
Outbreaks	Contact EHO or MOH on call.
Health Education	Not applicable
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine precautions. Contact precautions required only if wound drainage cannot be contained by dressing.
Occupational Health	Not applicable
Surveillance	
Case Definition	**Confirmed Case** Laboratory confirmation of infection with clinically compatible signs and symptoms: • Culture of *Bacillus anthracis* from a clinical specimen (e.g. blood) **OR** • Identification of *B. anthracis* in a clinical specimen (e.g. blood) using the fluorescent antibody technique **Probable Case** Clinically compatible signs and symptoms in a person in whom *B. anthracis* deoxyribonucleic acid (DNA) is detected and with an epidemiologic link to a confirmed case or suspected source. **Suspect Case** Clinically compatible signs and symptoms in a person with an epidemiologic link to a confirmed case or suspected source.
Reporting Requirements and Forms	**Anthrax is a notifiable infection in Nunavut:** 1. Notify your EHO immediately if during regular business hours, or the Public Health Emergency Contact if after regular business hours at 867-975-5772. 2. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 10.1.2). 3. Fax the form, within 24 hours of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: ○ Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 ○ All other Qikiqtaaluk communities: 867-473-2657 4. If you cannot contact your EHO, contact the Territorial Environmental Health Specialist at 867-975-5782.
Tools	
Guidelines	Not applicable
Materials & Resources	Not applicable
Cross Reference	Not applicable

References

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 2, 2014.

10.2.1 Brucellosis

Special Precautions/Considerations

Precautions: Routine (Contact if draining lesions)

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Brucellosis is caused by the bacterium *Brucella*. *Brucella* species are small, nonmotile, gram negative coccobacilli. The species that infect humans include *B. suis, B. abortus, B. melitensis* and rarely *B. canis*.
Clinical	
Clinical Presentation	Onset of Brucellosis may be acute or insidious. It is a systemic infection characterized by fever (continuous, intermittent or irregular), headache, weakness, sweating, chills, arthralgia, depression, weight loss or generalized aching. Localized infections of organs, including the liver and spleen, may be present. Infection may last for several days, months or occasionally for more than a year if not adequately treated. Most cases recover, however, relapses may occur in untreated persons. The case-fatality rate of untreated Brucellosis is less than 2% and usually results from endocarditis. Osteoarticular complications are seen in up to 60% of cases. Genitourinary involvement occurs in up to 20% of cases, with orchitis and epididymitis being reported most commonly.
Diagnostics	Diagnosis is made by isolation of the infectious agent from an appropriate clinical specimen. Diagnosis may also be made by serology when paired sera show a rise in antibody titre (see Case Definition section). Interpretation of serologic tests in “chronic” and recurrent cases is especially difficult since titres are usually low. Follow your regional laboratory procedures for testing.
Treatment	Treatment depends on clinical symptoms and the age of the case, and is usually prescribed for six weeks to prevent reoccurring infection. Antibiotics (i.e., doxycycline and rifampin) are effective against *Brucella.* It usually requires the administration of more than one antimicrobial for several weeks. Provide supportive case for specific symptoms as indicated. Consult with physician for treatment recommendations.
Pathogen	
Occurrence	**Worldwide**: Worldwide, especially in Mediterranean countries, Middle East, Africa, Central and South America, India and Mexico. The disease is often unrecognized and unreported. Brucellosis is predominantly an occupational disease of those who work with infected animals or their tissues, especially farm workers, veterinarians, meat inspectors and abattoir workers. There have been reports of isolated cases of infection with *B. canis* occurring in animal handlers from contact with dogs. Infection is common in those who eat raw caribou. **Canada**: Brucellosis is uncommon in Canada. An average of 10 cases per year has been reported since 1989. **Nunavut**: Since 2000, there has been an average of a single case per year, case counts range from 0-3 cases per year.

Reservoir	Animal reservoirs include cattle, swine, goats, sheep, elk, bison, caribou, and some species of deer, coyotes, and occasionally dogs. New species have been found in marine mammals.
Transmission	Transmission occurs through contact with infected tissues, blood, urine, vaginal discharge, aborted fetuses, or through the ingestion of raw milk or cheese from infected animals. Airborne inhalation in laboratories and abattoirs has also been reported, as has sexual transmission. Transmission from person-to-person is extremely rare. Mothers who are breastfeeding may transmit infection to their infants.
Incubation Period	The incubation period is variable and difficult to ascertain; usually 5-60 days, commonly 1-2 months, occasionally several months.
Communicability	There is no evidence of person-to-person transmission.
Susceptibility and Resistance	The severity and duration of the illness varies widely and the duration of acquired immunity following infection is uncertain.
Public Health Management	
Case	Confirm the diagnosis – ensure that all suspect cases receive prompt investigative procedures to confirm the case. Contact and interview the case, parent or guardian. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 10.2.2). Investigate cases of Brucellosis to determine the source of infection, being sure to obtain the following disease-specific information: • History of exposure to possible sources based on specific species identified on culture (in the past 60 days). • Food history (retain suspected food or water for laboratory analysis based on Environmental Health Officer [EHO] direction). • History of occupational risks (see Transmission section). • History of recent (international) travel. • History of past infection, as relapses of prior infection can occur. Provide Health Education to case on transmission and prevention of the disease.
Contacts	Investigate contacts (symptomatic and asymptomatic), such as co-workers and household members, to identify people who may have been exposed to the same source and who could also be infected. Provide Health Education to contacts on transmission and prevention of the disease.
Outbreaks	If a higher than normal amount of disease activity is detected, contact your EHO.

Health Education	• Educate hunters and animal herdsman about the proper handling of carcasses.
	  ○ Rubber gloves and protective clothing should be worn when handling viscera of animals.
	  ○ Discarded animal remains should be buried.
	  ○ Exercise care in handling and disposal of placenta, discharges, and fetus from an aborted animal.
	• Educate individuals about the dangers of consuming the uncooked viscera of animals.
	• All domestic and wild meats should be thoroughly cooked.
	• Travellers to foreign countries should be advised not to consume unpasteurized dairy products or undercooked meat products.

Health Settings Management

Infection Control Measures in Health Care Settings	Contact precautions if uncontained draining lesions, otherwise routine.
Occupational Health	Not applicable

Surveillance

Case Definition	**Confirmed case:** Clinical illness (see below) with laboratory confirmation of infection: • Isolation of *Brucella* species from an appropriate clinical specimen **OR** • Detection of *Brucella* nucleic acid (e.g. PCR) from an appropriate clinical specimen (e.g. blood, CSF, biopsy tissue) **OR** • A significant (i.e. fourfold or greater) rise in *Brucella* agglutination titre between acute and convalescent serum specimens obtained two or more weeks apart and tested in the same laboratory. **Probable Case** • Clinical illness (see below) in a person who is epidemiologically linked to a confirmed animal case **OR** • Clinical illness with supportive serology (*Brucella* agglutination titre of 1:160 or higher in one or more serum specimens obtained after symptom onset. **Clinical Illness** Clinical illness is characterized by acute or insidious onset of fever, night sweats, undue fatigue, anorexia, weight loss, headache and arthralgia.
Reporting Requirements and Forms	**Brucellosis is a notifiable infection in Nunavut:** 1. Notify your EHO. 2. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 10.2.2). 3. Fax the form, within 7 days of case notification to the EHO, as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: ○ Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 ○ All other Qikiqtaaluk communities: 867-473-2657 4. If you cannot contact your EHO, contact the Territorial Environmental Health Specialist at 867-975-5782.

Tools

Guidelines	Not applicable
Materials & Resources	**Fact Sheet: Brucellosis**
Cross Reference	Not applicable

References

Alberta Health and Wellness. Public Health Notifiable Disease Management Guidelines. Available online at: http://www.health.alberta.ca/documents/Guidelines-Brucellosis-2012.pdf

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American

Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on March 17, 2014.

10.3.1 Hantavirus Pulmonary Syndrome/Viral disease

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Hantaviruses are RNA viruses that are a part of the *Bunyaviridae* family. More than 25 antigenically distinguishable viral species exist, each associated primarily with a single rodent species.
Clinical	
Clinical Presentation	Hantavirus Pulmonary Syndrome infection often presents as a "flulike" illness, with fever, intense headache, myalgia, nausea and other gastrointestinal symptoms; this is followed by cough, shortness of breath, dizziness, sweats and arthralgia (usually within 5 days) and then pulmonary edema and deterioration of cardiopulmonary function may rapidly occur. The crude fatality rate is 40-50%.
Diagnostics	Consult your regional laboratory.
Treatment	Consult with physician.
Pathogen	
Occurrence	**Worldwide:** The disease was first recognized in 1993 in Southwest USA, but has been reported worldwide. Incidence appears to coincide with the distribution and population density of infected carrier rodents and their infection levels. **Canada:** Rare, with sporadic cases. Made nationally notifiable in 2000. **Nunavut:** No reported cases.
Reservoir	The major reservoir in North America is the deer mouse, found primarily in rural and semi-rural areas, often in barns and old buildings.
Transmission	Infected rodents shed live virus in their saliva, feces and urine; transmission primarily occurs through inhalation of aerosolized rodent saliva, urine or feces; through the bites of infected rodents; and through direct contact of broken skin or mucous membrane with rodent excreta.
Incubation Period	Not completely defined, however most often it has been found to be approximately 2 weeks after exposure, with a range from a few days to 6 weeks.
Communicability	No person-to-person spread documented in North America, however there have been reports of person-to-person spread of the Andes virus strain in an outbreak in Argentina.
Susceptibility and Resistance	All persons without prior infection are presumed to be susceptible, however protection and duration of immunity from previous infection is unknown. Rural dwellers, cottagers and campers are most at risk in endemic areas. Also any indoor exposure in closed, poorly ventilated areas with viable rodent infestation increases susceptibility to infection.
Public Health Management	
Case	Contact the Environmental Health Officer (EHO) or Medical Officer of Health (MOH) on call.
Contacts	Contact EHO or MOH on call.
Outbreaks	Not applicable
Health Education	Not applicable

Health Settings Management

Infection Control Measures in Health Care Settings	Routine
Occupational Health	Not applicable

Surveillance

Case Definition	**Confirmed Case** Laboratory confirmation of infection with clinically compatible signs and symptoms: • Detection of Immunoglobulin M (IgM) antibodies or a significant (i.e. fourfold or greater) rise in hantavirus-specific Immunoglobulin G (IgG) antibody titers **OR** • Detection of hantavirus-specific ribonucleic acid (RNA) in an appropriate clinical specimen **OR** • Detection of hantavirus antigen by immunohistochemistry
Reporting Requirements and Forms	**This is a notifiable infection in Nunavut:** 1. Notify your EHO immediately if during regular business hours, or the Public Health Emergency Contact if after regular business hours at 867-975-5772. 2. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 10.3.2). 3. Fax the form, within 24 hours of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: ○ Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 ○ All other Qikiqtaaluk communities: 867-473-2657 4. If you cannot contact your EHO, contact the Territorial Environmental Health Specialist at 867-975-5782.

Tools

Guidelines	Not applicable
Materials & Resources	Not applicable
Cross Reference	Not applicable

References

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 2, 2014.

10.4.1 Lyme Disease

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Lyme disease is a tick-borne zoonotic disease caused by the bacterium, *Borrelia burgdorferi* (*B. burgdorferi*).
Clinical	
Clinical Presentation	Lyme borreliosis is generally divided into 3 stages: (1) **Early localized disease:** Erythema migrans (EM) or "bull's eye" rash at the site of a recent tick bite, fever, malaise, headache, myalgia, neck stiffness, and arthralgia. (2) **Early disseminated disease:** Multiple erythema migrans in approximately 15% of people occurs several weeks after infective tick bite, cranial nerve palsies, lymphocytic meningitis, conjunctivitis, arthralgia, myalgia, headache, fatigue, carditis (heart block). (3) **Late disease:** May develop in people with early infection that was undetected or not adequately treated. Involves the heart, nervous system and joints; arrhythmias, heart block, significant myocardial dysfunction; recurrent arthritis affecting large joints (i.e. knees); peripheral neuropathy; central nervous system manifestations – meningitis; encephalopathy (i.e. behavior changes, sleep disturbance, headaches).
Diagnostics	Consult your regional laboratory.
Treatment	Consult with physician.
Pathogen	
Occurrence	**Worldwide:** Lyme disease has been found in Canada, the USA, Europe, the former Soviet Union, China and Japan. **Canada:** Populations of infected ticks are established in southern parts of Manitoba, Ontario and Quebec, areas of New Brunswick and Nova Scotia, and in southern British Columbia. With climate change areas with infected ticks is expected to expand. **Nunavut:** No reported cases.
Reservoir	Deer and small mammals such as rodents serve as important hosts to the tick vector, *Ixodes scapularis*, the primary *B. burgdorferi* vector in eastern Canada.
Transmission	Tick-borne: transmission usually does not occur until the tick has been attached for at least 24 hours.
Incubation Period	For EM rash, 7-10 days (range 3-32 days) after tick exposure; early stages of the illness may not be apparent and the person may present with later manifestations.
Communicability	There is no evidence of person-to-person spread.
Susceptibility and Resistance	All persons are probably susceptible, particularly persons that live in or travel to Lyme disease endemic areas.
Public Health Management	
Case	Contact the Regional Communicable Disease Coordinator (RCDC) or Medical Officer of Health (MOH) on call.
Contacts	Contact RCDC or MOH on call.
Outbreaks	Not applicable

Health Education	Not applicable
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine precautions
Occupational Health	Not applicable
Surveillance	
Case Definition	**Confirmed** Clinical evidence of illness with laboratory confirmation: • isolation of *Borrelia burgdorferi* from an appropriate clinical specimen **OR** • detection of *B. burgdorferi* DNA by PCR **OR** • Clinical evidence of illness with a history of residence in, or visit to, an endemic area* and with laboratory evidence of infection (positive serologic test using the two-tier ELISA and Western Blot criteria) **Probable** Clinical evidence of illness without a history of residence in, or visit to, an endemic area* and with laboratory evidence of infection: • positive serologic test using the two-tier ELISA and Western Blot criteria **OR** • Clinician-observed erythema migrans without laboratory evidence but with history of residence in, or visit to, an endemic area* * An endemic area is as a locality in which a reproducing population of *Ixodes scapularis* or *I. pacificus* tick vectors is known to exist, as demonstrated by molecular methods and to support transmission of *B. burgdorferi* at that site.
Reporting Requirements and Forms	**This is a notifiable infection in Nunavut:** 1. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 10.4.2). 2. Fax the form, within 7 days of case notification, to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833
Tools	
Guidelines	Not applicable
Materials & Resources	Not applicable
Cross Reference	Not applicable
References	

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 2, 2014.

10.5.1 Malaria

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Malaria is caused by protozoan parasites of the genus *Plasmodium*. Four species of *Plasmodium* infect humans: *P. vivax, P. ovale, P. malariae and P. falciparum.*
Clinical	
Clinical Presentation	Falciparum Malaria often causes varied symptoms, including fever, chills, sweats, cough, diarrhea, respiratory distress and headache, and may progress to jaundice, shock, bleeding, kidney and liver failure, and signs of brain involvement (disorientation, delirium, coma and death). The other parasites infecting humans are more benign. The illness usually begins with lethargy and a slowly rising fever over several days. It then progresses to shaking chills and a sudden rise in temperature, with nausea and headache; the temperature then suddenly falls with profuse sweating. After a fever-free interval the cycle repeats itself, either daily, every other day, or every third day or longer if untreated. The first attack lasts for about 1 month if left untreated. Subsequent relapses may occur over the ensuing years until partial or complete immunity results.
Diagnostics	Consult your regional laboratory.
Treatment	Consult with physician.
Pathogen	
Occurrence	**Worldwide:** Malaria no longer occurs in temperate zone countries such as Canada. It is a major cause of illness and death in many tropical and subtropical areas in South America, Southeast Asia and parts of sub-Saharan Africa. The occurrence of antibiotic-resistant Malaria in many parts of the world is a major concern. **Canada:** Malaria transmission in Canada does not occur. All reported cases have acquired their infections while travelling abroad. **Nunavut:** No reported cases.
Reservoir	Humans
Transmission	The disease is transmitted to humans through the bite of an infected female *Anopheles* mosquito. The disease may also be transmitted through injection or transfusion of infected blood; congenital transmission rarely occurs.
Incubation Period	The time between an infective bite and the appearance of clinical symptoms for *P. falciparum* is 9-14 days; 12-18 days for *P. vivax* and *P. ovale* and 18-40 days for *P. malariae*. Delayed primary attacks by some *P. vivax* strains may occur 6-12 months after exposure.
Communicability	Mosquitoes may acquire the parasites from infected humans as long as the gametocytes are present in the blood; this varies with parasite species and with response to therapy. Untreated or insufficiently treated patients may be a source of mosquito infection for several years, depending on the strain 1-5 years. Transfusion transmission may occur as long as asexual forms remain in the circulating blood (with *P. malariae* up to 40 years or longer). Stored blood can remain infective for at least one month.

Susceptibility and Resistance	Susceptibility is universal. Those most at risk are persons travelling to malaria-endemic areas who are not protected by chemoprophylaxis. It appears that African-Americans show a natural resistance to *P. vivax* and persons with sickle cell traits show a natural resistance to *P. falciparum*.
Public Health Management	
Case	Contact the Regional Communicable Disease Coordinator (RCDC) or Medical Officer of Health (MOH) on call.
Contacts	Contact RCDC or MOH on call.
Outbreaks	Not applicable
Health Education	Not applicable
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine precautions
Occupational Health	Not applicable
Surveillance	
Case Definition	**Confirmed case** Laboratory confirmation of infection with or without clinical evidence of infection: • demonstration of *Plasmodium* sp. in a blood smear/film (thick and thin) **Probable case** Laboratory confirmation of infection with or without clinical evidence of infection: • detection of *Plasmodium* sp. antigen in an appropriate clinical specimen **Note:** • A case is counted if it is the individual's first attack of Malaria in Canada, regardless of whether or not she/he has experienced previous attacks of Malaria outside the country. • A subsequent attack in the same person caused by a different *Plasmodium* species is counted as an additional case. • A repeat attack by the same species is not counted as a new case unless the person has traveled to a malaria-endemic area since the previous attack.
Reporting Requirements and Forms	**This is a notifiable infection in Nunavut:** 1. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 10.5.2). 2. Fax the form, within 24 hours of case notification, to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833 3. If you cannot contact your RCDC, contact the Territorial Communicable Disease Consultant at: 867-975-5734.
Tools	
Guidelines	Not applicable
Materials &	Not applicable

Resources	
Cross Reference	Not applicable

References

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Public Health Agency of Canada. Notifiable Diseases Online: Malaria, 2003. Available online at: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/malr-eng.php

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 2, 2014.

10.6.1 Plague

Special Precautions/Considerations

Precautions: Routine and Droplet

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	The causative agent of Plague is *Yersinia pestis*, a gram negative coccobacillus.
Clinical	
Clinical Presentation	Clinical illness is characterized by fever, chills, headache, malaise, prostration, and leukocytosis manifesting in one or more of the three main forms of Plague in humans: (1) **Bubonic Plague**: The most common form of human Plague, resulting from a flea bite. It presents as acute lymphadenitis in lymph nodes that drain the site of a fleabite (forms a bubo) and occurs more often in inguinal nodes and less commonly in axillary and cervical nodes. Lymph nodes become swollen and tender and may suppurate; fever is present. (2) **Septicemic Plague**: All forms of Plague, including those without lymphadenopathy may progress to Septicemic Plague with dissemination by the bloodstream to diverse parts of the body. (3) **Pneumonic Plague**: An infection of the lungs caused by the Plague bacillus. Secondary involvement of the lungs results in pneumonia; mediastinitis or pleural effusion may develop. Secondary Pneumonic Plague is of special significance, since respiratory droplets may serve as the source of person-to-person transfer with resultant Primary Pneumonic or Pharyngeal Plague. Untreated Bubonic Plague has a fatality rate of 50%, Pneumonic and Septicemic Plagues are fatal if not treated.
Diagnostics	Consult your regional laboratory.
Treatment	Consult with physician.
Pathogen	
Occurrence	**Worldwide:** Plague persists in vast areas due to infection of the wild rodent population in the Western United States, South America, north-central, eastern and southern Africa, and central and southeastern Asia. **Canada:** Plague transmission in Canada is extremely rare. The last reported cases occurred in 1924. **Nunavut:** No reported cases.
Reservoir	Wild rodents, such as ground squirrels, rabbits and hares, wild carnivores and domestic cats.
Transmission	**Bubonic**: Bite from an infected flea, which is the most common mode of transmission, or by handling tissues of an infected animal. **Pneumonic**: Inhalation of droplets or contact with sputum from an infected person or animal.
Incubation Period	**Bubonic**: 1-7 days. **Primary Pneumonic Plague**: 1-4 days.
Communicability	Bubonic Plague is not usually transmitted directly; Pneumonic Plague can be highly communicable under appropriate climatic conditions. Fleas may remain infective for months.
Susceptibility and	Susceptibility is general and immunity after recovery is relative and may not

Resistance	protect against a large infective dose.
Public Health Management	
Case	Contact the Environmental Health Officer (EHO) or Medical Officer of Health (MOH) on call.
Contacts	Contact EHO or MOH on call.
Outbreaks	Contact EHO or MOH on call.
Health Education	Not applicable
Infection Control Measures in Health Care Settings	Use routine practices for hospitalized cases as well as droplet precautions until pneumonia is excluded and appropriate therapy has been initiated. Droplet precautions should be continued for 48 hours after initiation of effective treatment in cases with Pneumonic Plague.
Occupational Health	Procedure mask when within 1 meter of patient until 72 hours after appropriate antibiotic therapy is received by the patient.
Surveillance	
Case Definition	**Confirmed Case** Laboratory confirmation of infection with clinically compatible signs and symptoms: • Isolation of *Yersinia pestis* from an appropriate clinical specimen (e.g. body fluids) **OR** • A significant (i.e. fourfold or greater) rise in serum antibody titre to *Y. pestis* fraction 1 (F1) antigen by enzyme immunoassay (EIA) or passive haemagglutination/inhibition titre **Probable Case** Clinically compatible signs and symptoms with one of the following laboratory results: • Demonstration of elevated serum antibody titre(s) to *Y. pestis* F1 antigen (without documented significant [i.e. fourfold or greater] rise) in a patient with no history of Plague immunization **OR** • Demonstration of *Y. pestis* F1 antigen by immunofluorescence **OR** • Detection of *Y. pestis* nucleic acid **OR** • >1:10 passive haemagglutination/inhibition titre in a single serum sample in a patient with no history of vaccination or previous infection **OR** • Detection of *Y. pestis* antibody by EIA
Reporting Requirements and Forms	**This is a notifiable infection in Nunavut:** 1. Notify your EHO immediately if during regular business hours, or the Public Health Emergency Contact if after regular business hours at 867-975-5772. 2. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 10.6.2). 3. Fax the form, within 24 hours of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: ○ Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 ○ All other Qikiqtaaluk communities: 867-473-2657 4. If you cannot contact your EHO, contact the Territorial Environmental Health Specialist at 867-975-5782.

Tools	
Guidelines	Not applicable
Materials & Resources	Not applicable
Cross Reference	Not applicable

References

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Public Health Agency of Canada. Notifiable Diseases Online: Plague, 2003. Available online at: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/plag-eng.php

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 2, 2014.

10.7.1 Rabies and Animal Exposure Protocol for Health Care Providers

Purpose	
	To provide guidance and direction for the assessment, treatment, reporting and follow up for all animal exposure incidents in Nunavut.

Policy and Legislation	
Public Health Act and Regulations	The Nunavut Public Health Act and Reporting and Disease Control Regulations (when they come into force) contain several provisions related to rabies including: • Health care professionals are required to report to the Chief Public Health Officer (CPHO), through the Environmental Health Officer (EHO), the occurrence of a human in contact with an animal that is known or suspected of being infected with rabies. • A veterinarian, conservation officer or by-law officer is required to report to the CPHO through the EHO an animal suspected of having rabies. • The CPHO can request more information including from a health or veterinary facility. • The EHO/CPHO is required to follow up both the patient and the animal in order to protect the public. • The EHO can order an animal suspected of having rabies to be seized, taken to a veterinarian and quarantined. • The CPHO can order an animal be destroyed.

Roles and Responsibilities	
Medical Officer of Health (MOH)	• Ensure a comprehensive rabies program is in place. • Ensure that all program protocols are up to date and appropriately distributed. • Be available to provide advice and guidance on animal exposures.
Territorial Environmental Health Specialist (EHS)	• Be available for consultation. • Ensure EHOs are up to date with current information and training around animal exposures. • Purchase vaccine for lay vaccinator program. • Ensure that Lay Vaccinator program is maintained and properly supplied. • Participate on appropriate Federal Provincial Territorial groups. • Ensure program performance standards are being met. • Support the development and management of a health information system for animal exposures.
Regional Environmental Health Officer (EHO)	• Provide risk assessment and follow up advice to health care providers on animal exposures as per protocol. • Ensure all animal exposures are investigated and managed as per the protocol and regulations.

	• Consult MOH for risk assessment guidance and direction as required. • Work with EHS and MOH to support the Lay Vaccinator Program. • Provide education on Rabies to stakeholders. • Receive training on Transport of Dangerous Goods and keep it updated every two years. • Send a copy of the completed Animal Incident Report Form and the Rabies Post Exposure Prophylaxis (PEP) Schedule Form to the epidemiologist.
Territorial Communicable Disease Coordinator (TCDC)	• Develop Rabies vaccine and Rabies Immune Globulin (RIG) protocols for humans. • Advise on vaccine issues i.e. pre and post exposure. • Advise on Adverse Events Following Immunization (AEFIs).
Regional Communicable Disease Coordinator (RCDC)	• Provide advice to Community Health Nurse/Public Health Nurse (CHN/PHN) and Supervisor of Community Health Programs (SCHP) on vaccine and RIG administration if required. • Receive and review AEFI reports.
Epidemiologist	• Manage and analyse data. • Produce reports. • Consult with team to provide support.
Community Health Nurse (CHN)	• Assess animal exposure in consultation with EHO. • Manage patient care. • Administer RIG and vaccine as directed. • Consult with Regional Communicable Disease Coordinator (RCDC) as needed about vaccine. • Initiate and complete forms; animal incident report and rabies post exposure prophylaxis (PEP) schedule form. • Liaise with EHO – send completed Animal Incident Report Form and Rabies Post Exposure Prophylaxis (PEP) Schedule Form to EHO.
Public Health Nurse (PHN)	• Arrange appointments for vaccine series • Consult with RCDC as needed about vaccine series
Supervisor Community Health Program (SCHP)	• Ensure adequate supply of rabies vaccine and rabies immune globulin is stocked in the health facility.
GN Pharmacy	• Ensure adequate supplies of rabies vaccine and rabies immune globulin are stocked in all health facilities
Conservation Officer	• Report all zoonoses, animals suspected as having rabies and all exposures to animals • Harvest and submit samples for testing • Collaborate with EHO on rabies sample submission. • Assist with animal quarantine. • Collaborate on overall Rabies control program in Nunavut • Ensure occupational health requirements for pre-exposure rabies

	immunization are met • Ensure regional EHO is listed on all sample submissions.
Municipality/ Hamlet	• Ensure Bylaw officers are vaccinated against Rabies • Provide community pound or animal shelter for animal confinement.
By Law Officer	• Report all zoonoses, animals suspected as having rabies and all exposures to animals • Harvest and submit samples for testing • Enforce animal control bylaws at a local level • Enforce quarantine at the local level • Ensure occupational health requirements for pre-exposure rabies immunization are met
Lay Vaccinator	• Provide and administer rabies vaccine to dogs and cats in the community

Rabies in Humans

Infectious Agent	Rabies virus is an RNA virus classified in the Rhabdoviridae family. There are different variants of the virus depending on the species e.g. fox strain or bat strain. However, a specific variant can be found in a different species e.g. bat rabies in a cat. The virus is easily killed by sunlight, soap and drying.
Reservoir	Rabies is a disease of mammals, both domestic and wild. In North America the main reservoir species are wild animals such as foxes, coyotes, wolves, skunks, raccoons, and bats. In Nunavut and the Northwest Territories (NWT) the virus is endemic in terrestrial carnivores (foxes and wolves) but other mammals may be infected, e.g. caribou, polar bear, dogs, cats.
Transmission	Rabies is primarily a disease of animals but can be transmitted to humans when virus in the saliva of an infected animal enters through a bite, scratch, broken skin or mucous membranes. The virus then gains access to the central nervous system through peripheral nerves. Bites from an infected animal are the main route of exposure. Person to person transmission is theoretically possible but rare and not well documented. Transmission through corneal, solid organ and blood vessel transplant from unsuspected rabies cases has occurred. Airborne spread has been demonstrated in caves where bats roost and in laboratory settings but occurs rarely.
Risk Factors	People who work in close contact with animals, such as veterinarians, veterinary staff, animal control and wildlife workers and laboratory workers who handle rabies virus are at higher risk of exposure to rabies. Individuals who engage in activities such as hunting and trapping that place them in close contact with potentially rabid animals may also be considered at higher risk of exposure. Children are considered at higher risk for exposure to rabies because they are more likely to approach animals and are less likely to report bites or scratches. Additionally, children may be more likely to be bitten on the face,

	which carries a higher risk of infection and bites to children can be severe.
Occurrence in humans	**Worldwide:** There are an estimated 65,000-87,000 deaths per year with most cases occurring in Asia and Africa. Most cases are due to inadequate post-exposure prophylaxis following a dog bite. **Canada:** Since records began in 1924 until 2009, 24 people in 6 provinces have died as a result of the disease. **Nunavut:** While no deaths due to rabies have been recorded in the area that is now Nunavut, the rabies virus is endemic in terrestrial carnivores.
Incubation Period	Animals: The incubation period and the manifestation of rabies vary in different species. The length of time virus may be excreted in saliva before the development of symptoms (asymptomatic carriage) has not been determined for the purpose of defining rabies exposure except in dogs, cats and ferrets. In dogs, cats and ferrets, rabies virus excretion does not generally precede symptom development beyond 10 days. Humans: Usually 3-8 weeks (9 days-7 years). The incubation period depends on wound severity, wound site in relation to nerve supply and distance from the brain, the amount and strain of virus, protection provided by clothing and other factors such as adequate wound cleansing.
Communicability	Rabid animals are infectious from the time the virus reaches the salivary glands and up until death. Death usually occurs within one week of onset of clinical signs. Different species may shed virus in saliva for different lengths of time prior to onset of clinical signs: dogs/cats/ferrets for 3 to 7 days (rarely over 4 days), longer with wildlife.
Susceptibility and Resistance	All terrestrial mammals are susceptible to rabies. Humans appear to be more resistant to infection as evidenced in a study where 40% of untreated individuals bitten by proven rabid animals developed the disease.
Clinical Presentation of **Animal** Rabies	Animals with rabies may show a variety of clinical signs. The disease can appear in two forms: **Dumb rabies** • Domestic animals may become depressed and try to hide in isolated places. • Wild animals may lose their fear of humans and appear unusually friendly. • Wild animals that usually only come out at night may be out during the day. • Animals may have paralysis. Areas most commonly affected are the face or neck (which causes abnormal facial expressions or drooling) or the hind

	legs. **Furious rabies** • Animals may become very excited and aggressive. • Periods of excitement usually alternate with periods of depression. • Animals may attack objects or other animals. They may even bite or chew their own limbs.
Clinical Presentation of **Human** Rabies	Rabies is an almost always fatal viral infection of the central nervous system. Early symptoms may include headache, malaise, fever and fatigue. There may be discomfort or pain at the exposure site (i.e. the site where the person was bitten). Symptoms progress quickly as the central nervous system is attacked, and the illness generally presents in one of two ways. The more common, agitated (furious) form presents with the classic symptoms of hydrophobia and aerophobia (severe laryngeal or diaphragmatic spasms and a sensation of choking when attempting to drink or when air is blown in the face) with rapidly progressing encephalitis and death. The paralytic form of the disease manifests in progressive flaccid paralysis, has a more protracted course, and is more difficult to diagnose.
Diagnostics	Animals: Diagnosis of rabies in an animal requires testing usually a fluorescent antibody test of brain tissue sampled from the dead animal. This is done by the Canadian Food Inspection Agency in their laboratory. Humans: Presumptive diagnosis may be based on specialized serological testing and other specialized tests done for suspect rabies at a tertiary care facility by a specialist.
Treatment	Treatment for humans is available and provided at tertiary care centers but is rarely successful.
Protocol for the follow-up of a patient exposed to an animal	
	See Protocol in Table 1
Occupational Health	
Occupational Health	All wildlife biologists, by-law officers, conservation officers and others who are at risk for rabies exposure due to their work, should receive pre-exposure immunization against rabies as per the Nunavut Immunization Guide.
Surveillance	
Reporting Requirements	**Human exposure to an animal** Animal Exposures are reportable to the CMOH via the EHO.

and Forms	1. Submit the Animal Incident Reporting Form to the EHO. See Appendix A. Note the contact information for the EHO is on the form. 2. Submit the Rabies Post Exposure Prophylaxis (PEP) Schedule Form to the EHO when PEP is completed. See Appendix B. **Suspect or Confirmed Human Case of Rabies** Rabies disease in humans is a reportable disease in Nunavut: 1. Notify the RCDC. 2. Submit a Communicable Disease Reporting form 3. Fax or scan the forms within 24 hours of case notification, to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833 4. If you cannot contact your RCDC, contact the Territorial Communicable Disease Coordinator at 867-975-5734.

Health Education

	Actions taken by the general public play an important role in preventing human cases of rabies. Provide the public with rabies information including symptoms and avoiding unprovoked animal encounters. Key messages include: • All wild animals potentially infected with rabies that have exposed a person must be observed or tested if available. • Individuals in high risk groups including, veterinarians, lab workers, wildlife workers and conservationists, lay vaccinators and individual traveling to areas where rabies is endemic should be immunized. • Pet owners should be aware of the signs and symptoms of rabies per the Signs and symptoms of animal rabies fact sheet. • The dangers of picking up dead, sick or hurt animals or domesticating wild animals. • Do not feed wild animals or leave leftover food around yards, parks etc. as it may attract wild animals. • Vaccinate animals in close contact with humans i.e. pets, sled dogs.

Resources

Guidelines	Canadian Immunization Guide
Materials & Resources	Rabies Immunoglobulin fact sheet
Cross Reference	Nunavut Immunization Manual

References

Canadian Immunization Guide: Public Health Agency of Canada. Available from

https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines/page-18-rabies-vaccine.html

Mortality Weekly Report (2008). Morbidity and Mortality Weekly Report Human Rabies Prevention – United States, Recommendations of the Advisory Committee on Immunization Practices. Vol. 57/RR-3. Retrieved from https:///www.cdc.gov/mmwr/preview/mmwrhtml/rr57e507a1.htm

Notifiable Diseases On-Line [Internet]. Ottawa: Public Health Agency of Canada; 2003. Rabies; 2003 Dec 11 [cited 2009 Feb 12]. Available from http://dsol-smed.phac-aspc.gc.ca/dsolsmed/ndis/diseases/rabi_e.html

Approval

Approved by Dr. Kim Barker, Chief Medical Officer of Health June 5, 2018.

To be appended:

1. Table 1. Protocol for the follow up of a patient with an animal exposure.
2. Animal Incident Reporting Form
3. Rabies Post Exposure Prophylaxis (PEP) Schedule Form

Table 1. Protocol for the Follow-up of a Patient with an Animal Exposure

Step 1: Health Care Provider (HCP) to assess the patient presenting with an animal exposure.

- Obtain a detailed history of the incident and the animal involved using the Animal Incident Report Form (Appendix A).
- Assess and treat the wound as per wound treatment protocols in consultation with the community physician as required.
- Check the patient's immunization record and chart for previous rabies vaccine, rabies immune globulin or rabies titres and tetanus immunization.
- Send the completed form to the EHO.

Report to the EHO while the patient is still in the clinic if possible.

Notes:

- The most effective procedure to prevent rabies is immediate and thorough cleaning and flushing of the wound.
- A history obtained from a child or a cognitively impaired adult may be unreliable.

Step 2: EHO and HCP to assess the exposure.

- The EHO will discuss the report with the HCP **as soon as possible** with particular attention to:
  - Reliability of the exposure history
  - Details on the type of exposure (bite i.e. penetration of skin by teeth, non-bite)
  - The location and severity of the patient's wound
  - Can a bite or saliva exposure into a scratch, wound or mucous membrane be ruled out? Can exposure to neural tissue be ruled out?

- If the patient **was not exposed**, no post exposure prophylaxis (PEP) is required. The EHO will complete the follow up portion of the form and return a copy to the HCP to be included on the chart.

- If the patient **was exposed**, the EHO will assess the likelihood that the attacking animal has rabies as per **Step 3**.

Notes:

- Rabies is only transmitted when the virus is introduced into a bite wound, open cuts in skin or onto mucous membranes such as the mouth or eyes.
- Rabies transmission occurs most commonly through a bite. Bites on the **face, neck or hand**

are considered higher-risk exposures due to the density of nerve endings in these areas.
- Non-bite exposure involves salivary contact on open skin (scratch or open wound) or mucous membrane. Transmission from non-bite exposures is rare.
- Petting a rabid animal or handling its blood, urine or feces are not considered exposures.

Step 3: EHO to assess the likelihood of the animal having rabies.

The EHO will assess the risk of the attacking animal having rabies taking the following factors into account:

- The circumstances of the incident e.g. provoked or unprovoked
- The type of attacking animal: a domestic pet, a wild animal or a stray animal?
- The behaviour of the attacking animal

Notes:

- More severe bites may suggest that the animal is rabid and also provide more opportunity for transmission.
- An unprovoked attack is more likely to indicate that the attacking animal is rabid although rabid animals may become uncharacteristically quiet.
- Provoking an animal includes:
  - attempting to feed or handle an animal
  - trapping or cornering an animal
  - approaching an injured animal
  - abusing the animal such as hitting a dog with a stick or pulling a cat's tail.
- Domestic dogs and cats kept indoors and supervised at all times while outdoors, are at low to no risk of rabies.
- Domestic pets with up-to-date rabies vaccine are unlikely to be infected with rabies.
- In domestic animals, abnormal behaviour may indicate the animal is rabid.
- Sled dogs, dogs tied outdoors, stray dogs or cats are more at risk of rabies.
- If a dog, or cat or ferret is healthy 10 days after it attacked a person it would not have been infectious at the time of exposure.
- Squirrels, hamsters, gerbils, sik-siks, small rodents, rabbit and hares etc. rarely have rabies as they are likely to be killed by the larger animal that could have transmitted rabies to them. PEP would only be considered if the animal's behavior is highly unusual.
- Generally, it is not possible to assess animal behavior in wild animals.

Step 4: EHO/MOH to recommend post exposure prophylaxis (PEP) or not.

The HCP is responsible to:

- counsel the patient on the risk of rabies and the risk and benefits of PEP if recommended
- administer PEP as per the rabies protocol in Section 11 of the Nunavut Immunization Manual for information on the dose and schedule etc. taking the following points into account:
- PEP for an exposed person not previously immunized against rabies includes vaccine

and rabies immune globulin (RIG) and is different from someone previously immunized against rabies
- give PEP as per the schedule even on the weekend
- consult with the RCDC (MOH after hours) on vaccination related questions including re-scheduling missed doses
- inform EHO of non-compliance with recommendations
- Send the Rabies Post Exposure (PEP) Schedule Form to the EHO once the first dose of vaccine and RIG is administered and when the series is complete

The EHO is responsible to:
- assess the risk in consultation with EHS/MOH as necessary
- advise the HCP of the decision regarding post exposure prophylaxis (PEP)
- follow up and manage the attacking animal. The HCP does not need to deal with the animal.
- inform the HCP of the outcome of animal testing or quarantine if done
- advise the HCP if PEP should be stopped based on animal testing or quarantine results
- follow up with the HCP if PEP was recommended:
    - On day 1 to determine if rabies vaccine and rabies immune globulin were provided as recommended.
    - On day 5 to determine compliance
    - On day 15 to determine if the rabies vaccine series was completed

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Step 5: Complete follow-up and close the file.

10.8.1 Tularemia

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Routine (within 7 days)

Infectious Agent	Tularaemia (also known as rabbit fever) is a zoonotic bacterial disease caused by the bacterium *Francisella tularensis (F. tularensis*), which is a small, Gram-negative nonmotile coccobacillus.
Clinical	
Clinical Presentation	Clinical presentation is typically sudden with an abrupt onset of fever, chills, myalgia and headache. Illness usually conforms to one of several tularemic syndromes, including: (1) **Ulcero-glandular:** Cutaneous ulcer with regional lymphadenopathy at the entry site (most common). (2) **Glandular**: Regional lymphadenopathy with no ulcer. (3) **Oculo-glandular**: Conjunctivitis with preauricular lymphadenopathy. (4) **Oropharyngeal:** Stomatitis or pharyngitis, or tonsillitis and cervical lymphadenopathy. (5) **Intestinal:** Intestinal pain, vomiting, and diarrhea. (6) **Pneumonic:** Primary pleuropulmonary disease. (7) **Typhoidal:** Febrile illness without early localizing signs and symptoms.
Diagnostics	Consult your regional laboratory.
Treatment	Consult with physician.
Pathogen	
Occurrence	**Worldwide:** The disease is endemic in North America, as well as much of Europe and Asia. **Canada:** Rare, sporadic cases reported. **Nunavut:** No reported cases.
Reservoir	Wild animals, especially rabbits, hares, voles, muskrats, beavers and some domestic animals, as well as various ticks.
Transmission	Common routes for human transmission include: (1) inoculation of the skin or mucous membranes with blood or tissue of animals, while handling infected animals, (2) bites from infected deerflies or ticks, or (3) handling or eating insufficiently cooked meat of infected animals. Less common means of spread include drinking contaminated water, inhaling dust from contaminated soil, or handling contaminated pelts or paws of animals.
Incubation Period	Related to size of innoculum; usually 3-5 days (range of 1-14 days).
Communicability	No person-to-person spread. Flies are infective for 14 days and ticks throughout lifetime (two years); frozen rabbit meat has remained infective for more than three years.
Susceptibility and Resistance	All ages are susceptible, and long term immunity follows recovery; reinfection is extremely rare and has been reported only in laboratory staff.
Public Health Management	
Case	Contact the Environmental Health Officer (EHO) or Medical Officer of Health (MOH) on call.
Contacts	Contact EHO or MOH on call.

Outbreaks	Not applicable
Health Education	Not applicable
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine precautions
Occupational Health	Not applicable
Surveillance	
Case Definition	**Confirmed case** Clinical illness* with laboratory confirmation of infection: • isolation of *Francisella tularensis* from an appropriate clinical specimen **OR** • a significant (e.g. fourfold or greater) change in serum antibody titre to *F. tularensis* antigen **Probable case** Clinical illness* with laboratory evidence: • detection of *F. tularensis* in a clinical specimen by fluorescent assay **OR** • detection of *F. tularensis* nucleic acid **OR** • ≥ 1:128 microagglutination titre or ≥ 1:160 tube agglutination in a single serum specimen Clinical diagnosis is supported by evidence or history of a tick or deerfly bite, exposure to the tissues of a mammalian host of *Francisella tularensis* or exposure to potentially contaminated water. *Clinical illness is characterized by several distinct forms: • **Ulceroglandular:** cutaneous ulcer with regional lymphadenopathy • **Glandular:** regional lymphadenopathy with no ulcer; oculoglandular conjunctivitis with preauricular lymphadenopathy; oropharyngeal stomatitis or pharyngitis; or tonsillitis and cervical lymphadenopathy • **Intestinal:** intestinal pain, vomiting, and diarrhea; pneumonic primary pleuropulmonary disease; typhoidal febrile illness without early localizing signs and symptoms
Reporting Requirements and Forms	**This is a notifiable infection in Nunavut:** 1. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 10.8.2). 2. Fax the form, within 7 days of case notification, to the EHO as follows: • Kitikmeot: 867-983-4193 • Kivalliq: 867-645-3102 • Qikiqtaaluk: ○ Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833 ○ All other Qikiqtaaluk communities: 867-473-2657
Tools	
Guidelines	Not applicable
Materials &	Not applicable

Resources	
Cross Reference	Not applicable

References

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Public Health Agency of Canada. Notifiable Diseases Online: Tularemia, 2003. Available online at: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/tula-eng.php

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 3, 2014.

10.9.1 West Nile Virus

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	West Nile Virus (WNV) is a mosquito-borne virus of the genus Flavivirus; it is an RNA Flavivirus, which is related antigenically to St. Louis Encephalitis and the Japanese Encephalitis viruses.
Clinical	
Clinical Presentation	There are three clinical manifestations of WNV; asymptomatic, non-neurological and neurological. The majority of WNV cases are asymptomatic. About 20% of infected persons develop the usually less severe symptom complex known as WNV non-neurological syndrome. This presents with a mild flu-like illness with fever, headache and body aches, occasionally with a skin rash and swollen lymph nodes or other non-specific symptoms that last several days. Other symptoms may include nausea, vomiting, eye pain or photophobia. WNV neurological symptoms can present as an encephalitis illness as well as conditions similar to acute flaccid paralysis, and Parkinson's disease.
Diagnostics	Consult your regional laboratory.
Treatment	Consult with physician.
Pathogen	
Occurrence	**Worldwide:** West Nile virus has been commonly found in Africa, Eastern Europe, West Asia, the Middle East and North America. **Canada:** In Canada the virus was first confirmed in birds in 2001 and the first human case was confirmed in Ontario in September 2002. The risk of acquiring WNV is seasonal as it is dependent on mosquitoes. The majority of Canadian cases occur in August and September. **Nunavut:** No reported cases.
Reservoir	Birds are the main reservoir of WNV in North America.
Transmission	Mosquitoes are the main vectors with the *Culex* genus being the primary vector. Indirect human transmission can occur through blood and organ donations, maternal to child transmission is very rare.
Incubation Period	Usually 2-15 days.
Communicability	No direct person-to-person transmission. Infected mosquitoes probably transmit virus throughout life.
Susceptibility and Resistance	Susceptibility appears to be general and throughout life in both sexes at all ages. Persons over 50 years of age have the highest risk of severe disease.
Public Health Management	
Case	Contact the Regional Communicable Disease Coordinator (RCDC) or the Medical Officer of Health (MOH) on call.
Contacts	Contact RCDC or the MOH on call.
Outbreaks	Not applicable
Health Education	Not applicable

Health Settings Management	
Infection Control Measures in Health Care Settings	Routine precautions
Occupational Health	Not applicable
Surveillance	
Case Definition	**WN virus Neurological Syndrome (WNNS)** **Confirmed** Clinical criteria AND AT LEAST ONE of the confirmed case diagnostic test criteria* **Probable** Clinical criteria AND AT LEAST ONE of the probable case diagnostic test criteria** **Suspect** Clinical criteria IN THE ABSENCE OF OR PENDING diagnostic test criteria* AND IN THE ABSENCE of any other obvious cause. **WN virus Non-Neurological Syndrome (WN Non-NS)** **Confirmed** Clinical criteria AND AT LEAST ONE of the confirmed case diagnostic test criteria* **Probable** Clinical criteria AND AT LEAST ONE of the probable case diagnostic test criteria** **Suspect** Clinical criteria IN THE ABSENCE OF OR PENDING diagnostic test criteria* AND IN THE ABSENCE of any other obvious cause. **WN virus Asymptomatic Infection (WNAI)** **Confirmed**[1] Confirmed case diagnostic test criteria* IN THE ABSENCE of clinical criteria **Probable** Probable case diagnostic test criteria** IN THE ABSENCE of clinical criteria **Clinical Evidence** **West Nile virus Neurological Syndrome (WNNS)** • History of exposure in an area where WN virus (WNV) activity is occurring [4] **OR** • History of exposure to an alternative mode of transmission [5] **AND** • Fever **AND NEW ONSET OF AT LEAST ONE of the following:** • Encephalitis (acute signs of central or peripheral neurologic dysfunction), **OR** • Viral meningitis (pleocytosis and signs of infection e.g., headache,

nuchal
rigidity) **OR**
• Acute flaccid paralysis (e.g., poliomyelitis-like syndrome or Guillain-Barré-like syndrome) [6] **OR**
• Movement disorders (e.g., tremor, myoclonus) **OR**
• Parkinsonism or Parkinsonia-like conditions (e.g., cogwheel rigidity, bradykinesia, postural instability) **OR**
• Other neurological syndromes [7]

West Nile virus Non-Neurological Syndrome (WN Non-NS)
• History of exposure in an area where WN virus (WNV) activity is occurring [4] **OR**
• History of exposure to an alternative mode of transmission [5] **AND AT LEAST TWO** of the following [7]

- fever
- myalgia [8]
- arthalgia
- headache
- fatigue
- lymphadenopathy
- maculopapular rash

Diagnostic Test Criteria
*****Confirmed Case AT LEAST ONE of the following**:**

- A significant (i.e. fourfold or greater) rise in WN virus neutralizing antibody titres (using a PRNT or other kind of neutralization assay) in paired acute and convalescent sera, or cerebrospinal fluid (CSF) **OR**
- Isolation of WN virus from, or demonstration of WN virus antigen or WN virus-specific genomic sequences in tissue, blood, CSF or other body fluids **OR**
- Demonstration of flavivirus antibodies in a single serum or CSF sample using a WN virus Immunoglobulin M (IgM) enzyme-linked immuno-sorbent assay (ELISA)[2,3], confirmed by the detection of WN virus specific antibodies using a PRNT (acute or convalescent serum sample) **OR**
- A significant (i.e. fourfold or greater) rise in flavivirus haemagglutination inhibition (HI) titres in paired acute and convalescent sera or demonstration of a seroconversion using a WN virus Immunoglobulin G (IgG) ELISA[2,3] **AND** the detection of WN specific antibodies using a PRNT (acute or convalescent serum sample).

****** Probable Case AT LEAST ONE of the following:

- Detection of flavivirus antibodies in a single serum or CSF sample using a WN virus IgM ELISA[2] without confirmatory neutralization serology (e.g. PRNT) **OR**
- A significant (i.e. fourfold or greater) rise in flavivirus HI titres in paired acute and convalescent sera or demonstration of a seroconversion using a WN virus IgG ELISA[2] **OR**
- A titre of > 1:320 in a single WN virus HI test, or an elevated titre in a WN virus IgG ELISA, with a confirmatory PRNT result [Note: A

	confirmatory PRNT or other kind of neutralization assay is not required in a health jurisdiction/authority where cases have already been confirmed in the current year] **OR** • Demonstration of Japanese encephalitis (JE) serocomplex-specific genomic sequences in blood by nucleic acid amplification test (NAT) screening on donor blood, by Blood Operators in Canada. **Comments** [1] This category includes asymptomatic blood donors whose blood is screened using a Nucleic Acid Amplification Test (NAT), by Blood Operators (i.e. Canadian Blood Services or Hema-Quebec) and is subsequently brought to the attention of public health officials. The NAT that is currently used by Blood Operators in Canada is designed to detect all viruses in the Japanese encephalitis (JE) serocomplex. The JE serocomplex includes WN virus and nine other viruses, although from this group only WN virus and St Louis encephalitis virus are currently endemic to parts of North America. Blood Operators in Canada perform a supplementary WN virus-specific NAT and antibody (IgM and IgG) testing following any positive donor screen test result. [2] Both CDC and commercial IgM / IgG ELISAs are now available for front line serological testing. Refer to appropriate assay procedures and kit inserts for the interpretation of test results. [3] Early in infection the immune system generates antibodies that bind relatively weakly to viral antigen (low avidity). As the infection proceeds, an increasing percentage of newly generated IgG antibody displays higher binding affinity to virus antigen and thus avidity also rises (Note: avidity is usually measured based upon the ability of IgG to dissociate from antigen preparations after incubation with a solution of urea). As long as high avidity IgG is not yet detected in the serum it can be assumed that the individual was exposed to the viral agent during a recent exposure. With respect to WNV infection it has not been precisely determined when (i.e. post-exposure) high avidity antibodies reach levels in serum that can be accurately detected by serological assays (there may be significant variation depending on the individual). However, it has been shown that > 95% of sera collected from individuals exposed to WNV 6-8 months previously will have IgG antibodies that bind strongly to viral antigen and will give high avidity scores using both indirect fluorescent antibody (IFA) and ELISA testing formats. ***Note: Avidity testing will not replace confirmatory neutralization testing, non-WNV flavivirus IgG antibody (e.g., dengue, St Louis encephalitis [SLE]) may bind to the antigen preparations used in avidity assays.*** Note: WNV IgM antibody may persist for more than a year and the demonstration of IgM antibodies in a patient's serum, particularly in residents of endemic areas, may not be diagnostic of an acute WN viral infection. Seroconversion (by HI, IgG ELISA or PRNT assays) demonstrates a current WNV infection. Therefore, the collection of acute and convalescent sera for serologic analysis is particularly important to rule out diagnostic misinterpretation early in the WNV season (e.g. May, June) and to identify initial cases in a specific jurisdiction. However, it should be noted that seroconversions may not always be documented due to timing of acute sample collection (i.e. titres in acute sera may have already peaked). If static titres are observed in acute and convalescent paired sera, it is still possible the case may represent a recent infection. To help resolve this, the use of IgG avidity testing may be considered to distinguish between current and past infection.

	The presence of both IgM antibody and low avidity IgG in a patient's convalescent serum sample are consistent with current cases of viral associated illness. However test results that show the presence of IgM and high avidity IgG are indicative of exposures that have occurred in the previous season. Immunocompromised individuals may not be able to mount an immune response necessary for a serological diagnosis. West Nile virus diagnostic test criteria for these individuals should be discussed with a medical microbiologist. [4] History of exposure when and where West Nile virus transmission is present, or could be present, or history of travel to an area with confirmed WNV activity in mosquitoes, birds, horses, other mammals or humans. [5] Alternative modes of transmission, identified to date, include: laboratory-acquired; in utero; receipt of blood components; organ/tissue transplant; and, possibly via breast milk. [6] A person with WNV-associated acute flaccid paralysis may present with or without fever or mental status changes. Altered mental status could range from confusion to coma with or without additional signs of brain dysfunction (e.g. paralysis, cranial nerve palsies, sensory deficits, abnormal reflexes, generalized convulsions and abnormal movements). Acute flaccid paralysis with respiratory failure is also a problem. Note: A significant feature of West Nile virus neurological illness may be marked muscle weakness that is more frequently unilateral, but could be bilateral. WNV should be considered in the differential diagnosis of all suspected cases of acute flaccid paralysis with or without sensory deficit. WNV- associated weakness typically affects one or more limbs (sometimes affecting one limb only). Muscle weakness may be the sole presenting feature of WNV illness (in the absence of other neurologic features) or may develop in the setting of fever, altered reflexes, meningitis or encephalitis. Weakness typically develops early in the course of clinical infection. Patients should be carefully monitored for evolving weakness and in particular for acute neuromuscular respiratory failure, which is a severe manifestation associated with high morbidity and mortality. For the purpose of WNV Neurological Syndrome Classification, muscle weakness is characterized by severe (polio-like), non-transient and prolonged symptoms. Electromyography (EMG) and lumbar puncture should be performed to differentiate WNV paralysis from the acute demyelinating polyneuropathy (Guillain-Barré syndrome). Lymphocytic pleocytosis (an increase in WBC with a predominance of lymphocytes in the cerebrospinal fluid [CSF]) is commonly seen in acute flaccid paralysis due to WNV. Other emerging clinical syndromes, identified in 2002 included, but were not limited to the following: myelopathy, rhabdomyolysis (acute destruction of skeletal muscle cells), peripheral neuropathy; polyradiculoneuropathy; optic neuritis; and acute demyelinating encephalomyelitis. Ophthalmologic conditions including chorioretinitis and vitritis were also reported. Facial weakness was also reported. Myocarditis, pancreatitis and fulminant hepatitis have not been identified in North America, but were reported in outbreaks of WNV in South Africa. "Aseptic" meningitis without encephalitis or flaccid paralysis occurring in August and September when WNV is circulating may be due to non-polio enteroviruses circulating at the same time. This should be considered in the differential diagnosis. [7] It is possible that other clinical signs and symptoms could be identified that

	have not been listed and may accompany probable case or confirmed case diagnostic test criteria. For example, gastrointestinal (GI) symptoms were seen in many WNV patients in Canada and the USA in 2003 and 2004. [8] Muscle weakness may be a presenting feature of WNV illness. For the purpose of WNV Non-Neurological Syndrome classification, muscle weakness or myalgia (muscle aches and pains) is characterized by mild, transient, unlikely prolonged symptoms that are not caused by motor neuropathy.
Reporting Requirements and Forms	**This is a notifiable infection in Nunavut:** 1. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 10.9.2). 2. Fax the form, within 24 hours of case notification, to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833 3. If you cannot contact your RCDC, contact the Territorial Communicable Disease Consultant at 867-975-5734.

Tools

Guidelines	Not applicable
Materials & Resources	Not applicable
Cross Reference	Not applicable

References

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at: http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Public Health Agency of Canada. Notifiable Diseases Online: West Nile Virus Neurological Symptom, 2003. Available online at: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/wnvns-eng.php

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health on January 3, 2014.

10.10.1 Yellow Fever

Special Precautions/Considerations

Precautions: Airborne and Contact

Reporting

Notifiable: Yes
Reporting: Immediate (as soon as suspected)

Infectious Agent	Yellow Fever is caused by the yellow fever virus: genus *Flavivirus* and family *Flaviviridae.*
Clinical	
Clinical Presentation	Yellow Fever is an acute viral disease of short duration and varying severity. The mildest cases may be clinically indeterminate. Typically, the clinical presentation is characterized by sudden onset of fever, chills, headache, backache, generalized muscle pain, prostration, nausea and vomiting. The pulse may be slow and weak out of proportion to the elevated temperature (Faget sign). Jaundice is moderate early in the disease and intensifies later. Most infections resolve after the 5th day, however some cases progress after a brief remission of hours to a day into the ominous stage of intoxication manifested by hemorrhagic symptoms including epistaxis, gingival bleeding, hematemesis (coffee ground or black), melaena and liver and renal failure. 20-50% of jaundiced cases are fatal.
Diagnostics	Consult your regional laboratory.
Treatment	Consult with physician.
Pathogen	
Occurrence	**Worldwide:** Yellow Fever exists in nature in two transmission cycles, a sylvatic or jungle cycle that involves mosquitoes and nonhuman primates, and an urban cycle involving *Aedes aegypti* mosquitoes and humans. It is endemic in tropical areas of Africa and Latin America. **Canada:** Transmission does not occur in Canada, reported cases are linked to travel. **Nunavut:** No reported cases.
Reservoir	Humans in urban areas; in forest areas, vertebrates other than humans, mainly monkeys and possibly marsupials.
Transmission	Yellow Fever is transmitted via the bite of infected mosquitoes, primarily those of the genus *Aedes*. There is no human-to-human transmission.
Incubation Period	3-6 days.
Communicability	Mosquitoes can acquire the virus from an infected person shortly before onset of fever and for the first 3-5 days of illness. The disease is highly communicable where many susceptible people and abundant vector mosquitoes coexist; it is not communicable through contact or common vehicles. *Aedes aegypti* mosquitoes require 9-12 days after a blood meal to become infectious and remain so for life.
Susceptibility and Resistance	Vaccine preventable; recovery from Yellow Fever is followed by lasting immunity; mild unapparent infections are common in endemic areas; previous infections with dengue give some degree of immunity.
Public Health Management	
Case	Contact the Regional Communicable Disease Coordinator (RCDC) or Medical

	Officer of Health (MOH) on call.
Contacts	Contact RCDC or MOH on call.
Outbreaks	Not applicable
Health Education	Not applicable
Health Settings Management	
Infection Control Measures in Health Care Settings	Airborne and contact precautions
Occupational Health	Not applicable
Surveillance	
Case Definition	**Confirmed case** Clinical illness with laboratory confirmation of infection: • isolation of yellow fever virus **OR** • detection of yellow fever viral antigen in body fluids or tissue **OR** • detection of yellow fever nucleic acid in body fluids or tissue **OR** • a significant (i.e. fourfold or greater) rise in antibody titre to the yellow fever virus in the absence of yellow fever vaccination **OR** • a single elevated yellow fever IgM antibody titre in the absence of yellow fever vaccination within the previous two months **Probable case** Clinical illness with laboratory evidence of infection: • a stable elevated antibody titre to yellow fever virus with no other known cause cross-reactive serologic reactions to other flaviviruses must be excluded, and the patient must not have a history of yellow fever vaccination
Reporting Requirements and Forms	**This is a notifiable infection in Nunavut:** 1. Complete the *Communicable Disease Report Form* dated September 2013 or later (section 10.10.2). 2. Fax the form, within 24 hours of case notification, to the RCDC as follows: • Kitikmeot: 867-983-4088 • Kivalliq: 867-645-8272 • Qikiqtaaluk: 867-975-4833 3. If you cannot contact your RCDC, contact the Territorial Communicable Disease Consultant at 867-975-5734.
Tools	
Guidelines	Not applicable
Materials & Resources	Not applicable
Cross Reference	Not applicable
References	
Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association. Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards – Infectious Diseases Protocol, 2009. Available online at:	

http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html

Public Health Agency of Canada. Notifiable Diseases Online: Tularemia, 2003. Available online at: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/tula-eng.php

Approval

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11.0 Other Diseases

The purpose of this section of the Communicable Disease Manual is to provide guidelines for several types of diseases and conditions of Public Health concern:

- Common illnesses that are not reportable but that occur frequently and for which Public Health is asked for information e.g. Hand, Foot and Mouth Disease, Head Lice;
- Illnesses that act as triggers for public health to investigate e.g. Acute Flaccid Paralysis as an indicator for Polio;
- Epidemic forms of other diseases e.g. increased frequency of diarrheal illness that triggers an outbreak investigation to rule out food or water contamination;
- Unusual clinical manifestations of a disease e.g. emerging pathogen such as SARS or MERS-CoV which both first presented as a severe respiratory infection for which no known pathogen was identified.

11.1.1 Acute Flaccid Paralysis (AFP)

Condition	Acute Flaccid Paralysis (AFP)
	Acute Flaccid Paralysis (AFP) is a broad clinical syndrome, typically characterized by rapid onset weakness, which may include respiratory and bulbar weakness. AFP may be the result of infectious or non-infectious agents. Polio can cause this clinical picture. This condition is reportable to the Chief Medical Officer of Health (CMOH), who will ensure that polio is ruled out.

References

Ontario Ministry of Health and Long-Term Care. Ontario
http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/afp_chapter.pdf

Public Health Agency of Canada. Case definitions for diseases under national surveillance. Can Commun Dis Rep. 2000 May;26 Suppl 3:i-1v 1-122. Available from:
http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09vol135/35s2/index-eng.php

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health, September 15, 2015

11.3.1 Fifth Disease (Parvovirus B19, Erythema Infectiosum)

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: No

Reporting: n/a

Infectious Agent	Fifth disease is caused by parvovirus B19.
Clinical	
Clinical Presentation	Infection usually begins with mild flu-like symptoms (headache, mild fever, fatigue), followed by a "slapped cheek" rash several days later. After 1 to 4 days, the rash becomes confluent giving a lacy appearance on the rest of the body. The rash may be itchy and worsens with exposure to heat (such as bathing) or sunlight. It may come and go for weeks or months. In adults (especially women) the illness may be more severe and include joint pain affecting the wrists, ankles and knees which can persist for months. Adults may not have the rash. Approximately 20 to 25% of those infected have mild symptoms or are asymptomatic. Fifth disease is usually mild for children and adults who are otherwise healthy, but for some people, fifth disease can cause serious health complications. They include: • Individuals with chronic hemolytic anemias (e.g., sickle cell disease) • Individuals with weakened immune systems • Pregnant women, who can pass the infection to the developing fetus. Pregnant women who are not immune usually do not have serious complications after exposure to someone infected with fifth disease. If a pregnant woman is infected, illness is usually mild and there is usually no risk to the fetus. However in rare situations, an infected woman can pass the infection to the fetus, anemia in the fetus develops and a miscarriage occurs. The highest risk is in the first twenty weeks of pregnancy.
Diagnostics	Fifth disease can often be diagnosed just by seeing the "slapped cheek" rash on a patient's face. Diagnosis is usually clinical but infection or immunity can be laboratory confirmed by serologic tests, if required. Follow your Regional laboratory procedures for serologic testing.
Treatment	Treatment is generally supportive. Most people infected recover completely without treatment.
Pathogen	
Occurrence	Worldwide. Occurs most often in the late winter and early spring.
Reservoir	Humans.
Transmission	Person-to-person through respiratory secretions (e.g., saliva, sputum or nasal mucous).
Incubation Period	Usually 4 to 21 days.

Communicability	Most communicable in the 7 to 10 day prodrome before the onset of rash. Once rash develops the individual is likely no longer infectious.
Susceptibility and Resistance	Susceptibility is general, more common in young children. Infection is believed to confer lifelong immunity. Approximately 50 to 65% of adults are estimated to be immune to fifth disease.
Public Health Management	
Case	• Educate the infected person (or their guardian) about transmission and communicability. • Avoid contact with other children and pregnant women (unless known to be immune) until the fever has broken.
Contacts	**Management of the exposed pregnant woman:** • Consultation with a physician is recommended if the pregnant woman: o Has been exposed to someone with Fifth Disease, o Has an illness that might be caused by parvovirus B19 infection, o Was recently infected with parvovirus B19. • Testing for Parvovirus B19 during pregnancy will determine: o Immunity and no recent signs of infection, o Non-immunity and have never been infected, or o Recent infection. • There is no single way to monitor pregnant women with parvovirus B19 infection. The physician may recommend additional prenatal visits, blood tests and ultrasounds.
Outbreaks	
Health Education	• Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing and before preparing foods and eating. • Avoid exposure to those infected if immune status is unknown.
Health Settings Management	
Infection Control Measures in Health Care Settings	Routine
Occupational Health	
Surveillance	
Case Definition	Not applicable; fifth disease is not a notifiable infection in Nunavut.
Reporting Requirements and Forms	Not applicable; fifth disease is not a notifiable infection in Nunavut.
Tools	
Guidelines	
Materials & Resources	**Fifth Disease Fact Sheet**

References

British Columbia Centre for Disease Control. Roseola. Available online at: http://www.healthlinkbc.ca/healthfiles/hfile54.stm

Centers for Disease Control and Prevention. Fifth disease. Available online at: http://www.cdc.gov/parvovirusb19/fifth-disease.html

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Approval

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11.4.1 Group A Streptococcus (Non-invasive)

Condition	Group A Streptococcus (Non-invasive)
	Group A Streptococcus (GAS) are bacteria commonly found in the throat and on the skin. People may carry these bacteria and have no symptoms of illness. When they do cause illness, it may present in one of two forms: • Invasive GAS infection (please refer to **Section 7.3**); or • Non-invasive GAS infection Common non-invasive GAS infections include strep throat, scarlet fever, impetigo, and ear infections. These infections are less severe and more contagious than invasive GAS infections. Early signs of non-invasive GAS infection include sore throat, fever, rash or a skin infection that is red, swollen, warm and tender to touch. Very few of those who come in contact with the GAS bacteria will develop an invasive infection. Clients can help stop the spread of GAS infections by practicing hand hygiene (with an alcohol based hand rub and soap and water) after coughing or sneezing and before preparing foods or eating. Coughs and sneezes should be covered. This condition is not reportable to the Chief Medical Officer of Health (CMOH).

References

Public Health Ontario, Partners for Health; at:
https://www.publichealthontario.ca/en/eRepository/iGAS_Recommendations_on_Public_Health_Management.pdf

Simcoe Muskoka District Health Unit, at:
http://www.simcoemuskokahealth.org/Topics/InfectiousDiseases/DiseaseInformation/FactSheetsIL/IGAS.aspx

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11.5.1 Hand, Foot and Mouth Disease (HFMD) (Coxsackievirus)

Special Precautions/Considerations

Precautions: Adult: Routine, Pediatric: Contact

Reporting

Notifiable: No
Reporting: n/a

Infectious Agent	Coxsackievirus group A, an enterovirus.
Clinical	
Clinical Presentation	Usually begins with a fever, poor appetite, malaise and sore throat. One or 2 days after onset of fever, painful sores usually develop in the mouth (herpangina), beginning as small red spots that blister and that often become ulcers. The sores are often in the back of the mouth. A skin rash develops over 1 to 2 days. The rash has flat or raised red spots, sometimes with blisters. The rash is usually on the palms of the hands and soles of the feet; it may also appear on the knees, elbows, buttocks or genital area. Some people, especially young children, may get dehydrated if they are not able to swallow enough liquids because of painful mouth sores. Persons infected may not develop all symptoms; some may only get mouth sores or skin rash.
Diagnostics	Diagnosis is usually clinical but can be laboratory confirmed by culture or serologic tests, if required.
Treatment	Treatment is generally supportive. Care at home to help relieve symptoms can include: • Ample cool fluids to help relieve the sore throat. Cold foods such as flavoured ice pops and ice cream also may help. • Avoid acidic or spicy foods and drinks, such as salsa or orange juice. These foods can aggravate mouth sores. • Use of mouthwashes or sprays that numb mouth pain. • Use of acetaminophen (such as Tylenol) or ibuprofen (such as Advil) for pain and fever. Avoid the use of ASA (such as Aspirin) in children, as it has been linked to Reye syndrome.
Pathogen	
Occurrence	Worldwide. Occurs most often in the summer and early fall.
Reservoir	Humans.
Transmission	Direct contact with nose and throat secretions and feces of infected persons (who may be asymptomatic) and by aerosol droplet spread.
Incubation Period	Usually 3 to 5 days.
Communicability	During the acute stage of illness and perhaps longer, as the virus persists in the stool for several weeks.
Susceptibility and Resistance	Susceptibility is universal. Immunity to the specific virus is possibly acquired through clinical or unapparent infection; duration unknown.
Public Health Management	
Case	• Educate the infected person (or their guardian) about transmission and communicability. • Avoid contact with other children until the acute stage of the illness has passed.

Contacts	Not applicable; contact management is required for children.
Outbreaks	Exclusion is not necessary. Once the diagnosis of hand, foot and mouth disease has been made, a child can return to the child care facility if well enough to take part in activities.
Health Education	• Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing and before preparing foods and eating. • Wash hands often with soap and water, especially after changing diapers and using the toilet. • Clean and disinfect frequently touched surfaces and soiled items, including toys. • Avoid close contact such as kissing, hugging, or sharing eating utensils or cups with people with hand, foot, and mouth disease.
Health Settings Management	
Infection Control Measures in Health Care Settings	Adult: Routine Pediatric: Contact
Occupational Health	
Surveillance	
Case Definition	Not applicable; hand, foot and mouth disease is not a notifiable infection in Nunavut.
Reporting Requirements and Forms	Not applicable; hand, foot and mouth disease is not a notifiable infection in Nunavut.
Tools	
Guidelines	
Materials & Resources	**Fact Sheet: Hand, Foot and Mouth Disease**

References

British Columbia Centre for Disease Control. Hand, Foot and Mouth Disease. Available online at: http://www.healthlinkbc.ca/healthtopics/content.asp?hwid=ty6230

Canadian Pediatric Society. Well Beings, A Guide to Promote the Physical Health and Emotional Well-Being of Children in Child Health Care Centres and Family Day care Homes. 2nd Edition.

Centers for Disease Control and Prevention. Hand, Foot and Mouth Disease. Available online at: http://www.cdc.gov/hand-foot-mouth/about/index.html

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Public Health Agency of Canada, at: http://www.phac-aspc.gc.ca/id-mi/ev71-eng.php

Approval

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11.6.1 Hemolytic Uremic Syndrome (HUS)

Condition	Hemolytic Uremic Syndrome (HUS)
	Hemolytic Uremic Syndrome (HUS) is a clinical syndrome characterized by acute renal failure, hemolytic anaemia, and thrombocytopenia. HUS mainly affects infants and young children. Cases may be preceded by an episode of infectious, sometimes bloody, diarrhea acquired as a foodborne illness or from a contaminated water supply and caused by E. coli 0157:H7, although Shigella, Campylobacter and a variety of viruses have also been implicated. This condition is reportable to the Chief Medical Officer of Health (CMOH), who will begin an immediate investigation in order to identify the cause (if unknown) and determine if there are other cases.

References

Canadian Paediatric Surveillance Program (CPSP) at:
http://www.cpsp.cps.ca/surveillance/study-etude/hemolytic-uremic-syndrome

Ontario Ministry of Health and Long Term Care, Ontario Public Health Standards, Infectious Diseases Protocol 2013, at:
http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/infdispro.aspx

Public Health Agency of Canada [Internet]. Ottawa, ON: Her Majesty the Queen in Right of Canada; 2003. Notifiable diseases on-line: Verotoxic E. coli; [updated 2003 Dec 11; cited 2009 Feb 12. Available from: http://dsol-smed.hc-sc.gc.ca/dsol-smed/ndis/diseases/ecol_e.html

Approval

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11.7.1 Lice

Special Precautions/Considerations

Precautions:

Reporting

Notifiable: No

Reporting: n/a

Infectious Agent	Lice are parasitic insects that survive by feeding on human blood. There are three different types of lice that live on humans, each preferring a different area of the body. They are: • *Pediculus humanus capitis* (head louse), • *Pediculus humanus corporis* (body louse, clothes louse), and • *Pthirus pubis* ("crab" louse, pubic louse).
Clinical	
Clinical Presentation	Head lice: Head lice infestations can be asymptomatic. Itching ("pruritus") is the most common symptom of head lice infestation and is caused by an allergic reaction to the bites. It may take 4–6 weeks for itching to appear the first time a person has head lice. Other symptoms may include: • A tickling feeling on the scalp or a sensation of something moving in the hair; • Irritability and sleeplessness; and • Sores on the head caused by scratching. These sores caused by scratching can sometimes become infected with bacteria normally found on a person's skin. Head lice are not known to transmit any disease and therefore are not considered a health hazard. Body lice: Intense itching and rash caused by an allergic reaction to the bites are common symptoms of body lice infestation. Intense itching leads to scratching which can cause sores and secondary bacterial infection of the skin. • When body lice infestation is long lasting, heavily bitten areas of the skin can become thickened and darkened, particularly in the mid-section of the body. This condition is called "vagabond's disease." • Only the body louse is known to spread disease (epidemic typhus, trench fever, and epidemic relapsing fever). Pubic lice: Itching ("pruritus") in the pubic and groin area is the most common symptom of pubic lice infestation. Intense itching leads to scratching which can cause sores and secondary bacterial infection of the skin. • Visible lice eggs ("nits") or lice crawling or attached to pubic hair, or less commonly other hairy areas of the body (eyelashes, eyebrows, beard, mustache, armpits, chest, back) are other signs of pubic lice infestation. • Pubic lice on the head (eyelashes or eyebrows) of a child may be an indication of sexual exposure or abuse. • Pubic lice are not known to transmit any disease. Persons infested with pubic lice should be evaluated for other sexually transmitted diseases (STIs).
Diagnostics	Head lice: The diagnosis of head lice infestation is best made by finding a live nymph or adult louse on the scalp or hair of a person.

	• Because adult and nymph lice are very small, move quickly, and avoid light, they may be difficult to find. The use of a fine-toothed lice comb or magnifying glass may assist with the identification of live lice. • If crawling lice are not seen, finding nits attached firmly within ¼ inch of the base of hair shafts suggests, but does not confirm, the person is infested. • Nits are frequently seen on hair behind the ears and near the back of the neck. • Nits that are attached more than ¼ inch from the base of the hair shaft are almost always non-viable (hatched or dead). • If no nymphs or adults are seen, and the only nits found are more than ¼ inch from the scalp, then the infestation is probably old and no longer active, and does not need to be treated. • Nits may be confused with other particles found in hair such as dandruff, hair spray droplets, and dirt particles. <u>Body lice</u>: Body lice infestation is diagnosed by finding eggs and crawling lice in the seams of clothing. Sometimes a body louse can be seen crawling or feeding on the skin. Although body lice and nits can be large enough to be seen with the naked eye, a magnifying lens may be necessary to find crawling lice or eggs. <u>Pubic lice</u>: Pubic lice infestation is diagnosed by finding a "crab" louse or eggs on hair in the pubic region or, less commonly, elsewhere on the body (such as the eyebrows, eyelashes, beard, mustache, armpit, perianal area, groin, trunk and/or scalp). Although pubic lice and nits can be large enough to be seen with the naked eye, a magnifying lens may be necessary to find lice or eggs.
Treatment	Non-pharmacological measures may also be used in combination with the treatments described below to control a lice infestation. For example, hats, scarves, pillow cases, bedding, clothing, and towels worn or used by the infested person in the 2-day period just before treatment is started can be machine washed and dried using the hot water and hot air cycles because lice and eggs are killed by exposure for 5 minutes to temperatures greater than 53.5°C (128.3°F). Items that cannot be laundered may be dry-cleaned or sealed in a plastic bag for two weeks. Items such as hats, grooming aids, and towels that come in contact with the hair of an infested person should not be shared. Vacuuming furniture and floors can remove an infested person's hairs that might have viable nits attached. • Nix (permethrin 1%) cream rinse is the first line treatment **for all infestations**. Other treatments include RESULTZ (Isopropyl Myristate 50% solution) and R & C (Piperonyl Butoxide, Pyrethrins) 3% and 0.3% Shampoo. These medications are safe and effective when used exactly according to the instructions in the package or on the label. <u>Head lice</u>: • Treatment for head lice is recommended for persons diagnosed with an active infestation. All household members and other close contacts should be checked; those persons with evidence of an active infestation should be treated. All infested persons (household members and close contacts) and their bedmates should be treated at the same time. • Retreatment of head lice usually is recommended because no approved treatment is completely ovicidal (i.e. do not kill all the egg stages). The retreatment schedule can vary depending on the treatment used.

	• Removal of all nits after successful treatment with a pediculicide is not necessary to prevent further spread. Removal of nits after treatment may be done for aesthetic reasons, or to reduce diagnostic confusion and the chance of unnecessary retreatment. Because pediculicides are not 100% ovicidal, some experts recommend the manual removal of nits that are attached within ¼ inch of the base of the hair shaft.
	• Treatments for head lice are generally safe and effective when used correctly. Some treatments may cause an itching or a mild burning sensation caused by inflammation of the skin on the scalp. All medicines used for the treatment of lice should be used with care and only as directed.
	
	Body lice:
	• A body lice infestation is treated by improving the personal hygiene of the infested person, including assuring a regular (at least weekly) change of clean clothes. Clothing, bedding, and towels used by the infested person should be laundered using hot water (at least 130°F) and machine dried using the hot cycle.
	• Sometimes the infested person also is treated with a pediculicide; however, a pediculicide generally is not necessary if hygiene is maintained and items are laundered appropriately at least once a week. A pediculicide should be applied exactly as directed on the bottle or by your physician.
	• If you choose to treat, guidelines for the choice of the pediculicide are the same as for head lice.
	
	Pubic lice:
	• Following treatment, most nits will still be attached to hair shafts. Nits may be removed with fingernails or by using a fine-toothed comb.
	• Put on clean underwear and clothing after treatment.
	• Repeat treatment in 9–10 days if live lice are still found.
	• Special instructions for treatment of lice and nits found on eyebrows or eyelashes:
	  o If only a few live lice and nits are present, it may be possible to remove these with fingernails or a nit comb.
	  o If additional treatment is needed for lice or nits on the eyelashes, careful application of ophthalmic-grade petrolatum ointment (only available by prescription - available in tear gel formulation from the health center) to the eyelid margins 2–4 times a day for 10 days is effective. Regular Vaseline should **NOT** be used because it can irritate the eyes if applied.

Pathogen	
Occurrence	Worldwide. Outbreaks of head lice are common among children in schools and institutions everywhere. Body lice are prevalent among populations with inadequate personal hygiene, especially in cold climates where heavy clothing is worn and bathing is infrequent, or in situations when people cannot change clothes.
Reservoir	Humans.
Transmission	Head lice: Head lice are spread most commonly by direct head-to-head (hair-to-hair) contact. However, much less frequently they are spread by sharing clothing or belongings onto which lice have crawled or nits attached to shed hairs may have fallen. The risk of getting infested by a louse that has fallen onto a carpet or furniture is very small. Head lice survive less than 1–2 days if they fall off a person and cannot feed; nits cannot hatch and usually die within a week if they are not kept at the same temperature as that found close to the scalp.

	Body lice: Body lice are spread most commonly by direct contact with an infested person or an infested person's clothing or bedding. Pubic lice: Pubic lice most commonly are spread directly from person to person by sexual contact. Pubic lice very rarely may be spread by clothing, bedding, or a toilet seat.
Incubation Period	The life cycle of the louse has three stages: egg, nymph, and adult. Nits are lice eggs; they take about a week to hatch and become nymphs. Nymphs look like smaller versions of adult lice and become adults in about 7 days. Adult lice can live up to 30 days on a person. To live, adult lice need to feed on human blood several times daily. Without blood meals, the louse will die within 1 to 2 days off the host.
Communicability	As long as lice or eggs remain viable on the infested person or on fomites.
Susceptibility and Resistance	General; any person may become infested under suitable exposure conditions. Repeated infestations may occur.
Public Health Management	
Case	• Educate the infested person about transmission and communicability and appropriate treatment. • Persons with pubic lice should be examined and treated for any other sexually transmitted infections (STIs) that may be present.
Contacts	Head lice: • Examine household and close contacts; treat those who are infested. Body lice: • Examine household and close contacts; treat those who are infested. Pubic lice: • All sex partners from within the previous month should be informed that they are at risk for infestation and should be treated • Persons should avoid sexual contact with their sex partner(s) until both they and their partners have been successfully treated and reevaluated to rule out persistent infestation.
Outbreaks	
Health Education	The following are steps that can be taken to help prevent and control the spread of lice: Head lice: • Avoid head-to-head (hair-to-hair) contact during play and other activities at home, school, and elsewhere (sports activities, playground, slumber parties, and/or camp). • Do not share clothing such as hats, scarves, coats, sports uniforms, hair ribbons, or barrettes. • Do not share combs, brushes, or towels. Disinfest combs and brushes used by an infested person by soaking them in hot water (at least 130°F) for 5–10 minutes. • Do not lie on beds, couches, pillows, carpets, or stuffed animals that have recently been in contact with an infested person. • Machine wash and dry clothing, bed linens, and other items that an infested person wore or used during the 2 days before treatment using the hot water (130°F) laundry cycle and the high heat drying cycle. Clothing and items that are not washable can be dry-cleaned OR sealed in a plastic bag and stored for 2 weeks.

	• Vacuum the floor and furniture, particularly where the infested person sat or lay. However, spending much time and money on housecleaning activities are not necessary to avoid reinfestation by lice or nits that may have fallen off the head or crawled onto furniture or clothing. • Do not use fumigant sprays or fogs; they are not necessary to control head lice and can be toxic if inhaled or absorbed through the skin. Body lice: • Bathe regularly and change into properly laundered clothes at least once a week; launder infested clothing at least once a week. • Machine wash and dry infested clothing and bedding using the hot water (at least 130°F) laundry cycle and the high heat drying cycle. Clothing and items that are not washable can be dry-cleaned OR sealed in a plastic bag and stored for 2 weeks. • Do not share clothing, beds, bedding, and towels used by an infested person. • Fumigation or dusting with chemical insecticides sometimes is necessary to control and prevent the spread of body lice for certain diseases (epidemic typhus). Pubic lice: • Machine wash and dry clothing worn and bedding used by the infested person in the hot water (at least 130°F) laundry cycle and the high heat drying cycle. Clothing and items that are not washable can be dry-cleaned OR sealed in a plastic bag and stored for 2 weeks. • Do not share clothing, bedding, and towels used by an infested person. • Do not use fumigant sprays or fogs; they are not necessary to control pubic ("crab") lice and can be toxic if inhaled or absorbed through the skin.
Surveillance	
Case Definition	Not applicable; lice is not a notifiable infection in Nunavut.
Reporting Requirements and Forms	Not applicable; lice is not a notifiable infection in Nunavut.
Tools	
Guidelines	
Materials & Resources	**Body Lice Fact Sheet** **Head Lice Fact Sheet** **Pubic Lice Fact Sheet**
References	
Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association. Centers for Disease Control and Prevention: Lice. Available online at: http://www.cdc.gov/parasites/lice/	
Approval	
Approved by Dr. Maureen Baikie, Chief Medical Officer of Health, September 16, 2015	

11.8.1 Roseola

Special Precautions/Considerations

Precautions: Routine

Reporting

Notifiable: No

Reporting: n/a

Infectious Agent	*Roseola infantum* is an infection of infants or very young children caused by human herpesvirus 6 (HHV-6) or, less commonly, HHV-7.
Clinical	
Clinical Presentation	Fever of 39.5 to 40.5° C begins abruptly and persists 3 to 5 days without any localizing symptoms or signs. Despite the high fever, the child is usually alert and active, although febrile seizures may occur. Cervical and posterior auricular lymphadenopathy often develops. Encephalitis or hepatitis occurs rarely. The fever usually falls rapidly on the 4th day, and when the fall occurs, a macular or maculopapular exanthem usually appears prominently on the chest and abdomen and, to a lesser extent, on the face and extremities; it lasts for a few hours to 2 days and may be unnoticed in mild cases. In 70% of HHV-6 infections, the classic exanthem does not occur. One of the key features of roseola is that the rash appears after the fever has ended. In most other childhood illnesses, the fever and the rash happen at the same time.
Diagnostics	Roseola may be suspected when a child aged 6 mo to 3 yr develops typical symptoms and signs. Diagnosis is usually clinical but can be laboratory confirmed by culture or serologic tests, if required.
Treatment	Treatment is generally supportive. Most children recover fully from roseola within a week of the onset of the fever.
Pathogen	
Occurrence	Worldwide. Occurs most often in the spring and fall.
Reservoir	Humans.
Transmission	The exact mode of transmission is unknown, but droplet spread of respiratory secretions is believed to play a role.
Incubation Period	Usually 5 to 15 days.
Communicability	Unknown; communicability likely greatest during the febrile stage of the illness.
Susceptibility and Resistance	Susceptibility is general. Infection is believed to confer lifelong immunity.
Public Health Management	
Case	• Educate the infected person (or their guardian) about transmission and communicability. • Avoid contact with other children until the fever has broken.
Contacts	Not applicable; contact management is not required for roseola infections.
Outbreaks	
Health Education	• Educate the public and health care workers about reducing the spread of all types of infection by proper hand hygiene especially after coughing and sneezing and before preparing foods and eating. • Avoid exposure to those infected if immune status is unknown.

Health Settings Management	
Infection Control Measures in Health Care Settings	Routine
Occupational Health	
Surveillance	
Case Definition	Not applicable; roseola is not a notifiable infection in Nunavut.
Reporting Requirements and Forms	Not applicable; roseola is not a notifiable infection in Nunavut.
Tools	
Guidelines	
Materials & Resources	**Fact Sheet: Roseola**

References

British Columbia Centre for Disease Control. Roseola. Available online at: http://www.healthlinkbc.ca/healthfiles/hfile83.stm

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Mayo Clinic. Roseola. Available online at: http://www.mayoclinic.org/diseases-conditions/roseola/basics/prevention/con-20023511

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health, September 17, 2015

11.9.1 Scabies

Special Precautions/Considerations

Precautions:

Reporting

Notifiable: No

Reporting: n/a

Infectious Agent	Human scabies is caused by an infestation of the skin by the human itch mite (*Sarcoptes scabiei* var. *hominis*). The microscopic scabies mite burrows into the upper layer of the skin where it lives and lays its eggs.
Clinical	
Clinical Presentation	The most common symptoms of scabies, itching and a skin rash, are caused by sensitization (a type of "allergic" reaction) to the proteins and feces of the parasite. Severe itching (pruritus), especially at night, is the earliest and most common symptom of scabies. A pimple-like (papular) itchy (pruritic) "scabies rash" is also common. Rashes appear more commonly in the webs between the fingers, the insides of the wrists and elbows, the breasts, the male genitals, the belt line, the back and the buttocks. Infants may have a rash on the head, neck, palms or soles. Tiny burrows are sometimes seen on the skin; these are caused by the female scabies mite tunneling just beneath the surface of the skin. These burrows appear as tiny raised and crooked (serpiginous) grayish-white or skin-colored lines on the skin surface. Because mites are often few in number (only 10-15 mites per person), these burrows may be difficult to find. They are found most often in the webbing between the fingers, in the skin folds on the wrist, elbow, or knee, and on the penis, breast, or shoulder blades.
Diagnostics	Diagnosis may be established by recovery from a burrow and microscopic identification of the mite, eggs or mite feces (scybala).
Treatment	Products used to kill scabies mites are called *scabicides*. There are no non-prescription products approved to treat human scabies. The following medications for the treatment of scabies are available only by prescription or at Community Health Centers: • <u>Permethrin cream 5% (Nix)</u> Permethrin is safe and effective when used as directed. Permethrin kills the scabies mite and eggs. Permethrin is the drug of choice for the treatment of scabies. Two (or more) applications, each about a week apart, may be necessary to eliminate all mites. • <u>Crotamiton lotion 10% and Crotamiton cream 10%</u> Frequent treatment failure has been reported with crotamiton in the United States. Bedding, clothing, and towels used by infested persons or their household, sexual, and close contacts anytime during the three days before treatment should be washed in hot water and dried in a hot dryer, by dry-cleaning, or by sealing in a plastic bag for at least 72 hours. Scabies mites generally do not survive more than 2 to 3 days away from human skin. Because the symptoms of scabies are due to a hypersensitivity reaction (allergy) to mites and their feces (scybala), itching still may continue for several weeks after treatment even if all the mites and eggs are killed. If itching still is present more than 2 to 4 weeks after treatment or if new burrows or pimple-like rash lesions continue to appear, retreatment may be necessary. Skin sores that become infected should be treated with an appropriate antibiotic.

Pathogen	
Occurrence	**Worldwide**: Scabies can affect people of all social classes and all standards of personal hygiene. Scabies can spread rapidly under crowded conditions where close body contact is frequent. Institutions such as nursing homes, extended-care facilities, and prisons are often sites of scabies outbreaks.
Reservoir	Humans.
Transmission	The scabies mite usually is spread by direct, prolonged, skin-to-skin contact with a person who has scabies. Transmission from undergarments and bedding occurs only if these have been contaminated by infested persons immediately beforehand. Mites can burrow beneath the skin surface in about 1 hour.
Incubation Period	Two to 6 weeks in persons without previous exposure; persons who have been previously infested develop symptoms 1 to 4 days after exposure.
Communicability	Until mites and eggs are destroyed by treatment, usually after 1 or 2 courses of treatment a week apart.
Susceptibility and Resistance	Some resistance is suggested; fewer mites succeed in establishing themselves on persons previously infested than those with no prior exposure. Immunocompromised persons are susceptible to hyperinfestation.
Public Health Management	
Case	Educate the infested person about transmission and communicability and appropriate treatment.
Contacts	• In addition to the infested person, treatment also is recommended for household members and sexual contacts, particularly those who have had prolonged direct skin-to-skin contact with the infested person. • Both sexual and close personal contacts who have had direct prolonged skin-to-skin contact with an infested person within the preceding month should be examined and treated. • All persons should be treated at the same time to prevent reinfestation.
Outbreaks	
Health Education	• Scabies is prevented by avoiding direct skin-to-skin contact with an infested person or with items such as clothing or bedding used by an infested person. • Bedding and clothing worn or used next to the skin anytime during the 3 days before treatment should be machine washed and dried using the hot water and hot dryer cycles or be dry-cleaned. Items that cannot be dry-cleaned or laundered can be disinfested by storing in a closed plastic bag for several days to a week. • Children and adults usually can return to child care, school, or work the day after treatment. • Persons with crusted scabies and their close contacts, including household members, should be treated rapidly and aggressively to avoid outbreaks. Institutional outbreaks can be difficult to control and require a rapid, aggressive, and sustained response. • Rooms used by a patient with crusted scabies should be thoroughly cleaned and vacuumed after use.

Surveillance

Case Definition	Not applicable; scabies is not a notifiable infection in Nunavut.
Reporting Requirements and Forms	Not applicable; scabies is not a notifiable infection in Nunavut.

Tools

Guidelines	
Materials & Resources	**Scabies Fact Sheet**

References

British Columbia Centre for Disease Control. Scabies. Available online at: http://www.healthlinkbc.ca/healthfiles/hfile09.stm

Canadian Pediatric Society (CPS), Position Statement on Scabies, October 5, 2015. Available online at: http://www.cps.ca/en/documents/position/scabies

CPS position statement Housing need in Canada: Healthy lives start at home, October 5, 2015. Available online at: http://www.cps.ca/en/documents/position/housing-need

Centers for Disease Control and Prevention. Scabies. Available online at: http://www.cdc.gov/parasites/scabies/disease.html

Heymann, D. L. (Ed.) (2008). Control of Communicable Diseases Manual. 19th Edition. American Public Health Association.

Approval

Approved by Dr. Maureen Baikie, Chief Medical Officer of Health, October 10, 2015

11.10 Epidemic Forms of Other Diseases

Condition	Epidemic Forms of Other Diseases
	Although not all diseases are reportable to the CMOH, there are always public health concerns when any disease occurs more frequently than expected. If any illness or condition is occurring in an unusual amount, in a specific location, or has been linked with a specific activity; these are considered to be “reportable” and should be immediately reported to your RCDC, and in turn reported to the Office of the Chief Medical Officer of Health.
Approval	
Approved by Dr. Maureen Baikie, Chief Medical Officer of Health, September 17, 2015	

11.11 Unusual Clinical Manifestations of Disease

Condition	Unusual Clinical Manifestations of Disease
	There are always new pathogens emerging, and known pathogens can always mutate and cause changes in clinical manifestations. For these reasons, it is important to report any unusual clinical manifestation with possible infectious cause (e.g. severe bloody diarrhea, severe respiratory illness) to your RCDC so that proper follow-up, outbreak investigation and management may be initiated as soon as possible, if deemed necessary.
Approval	
Approved by Dr. Maureen Baikie, Chief Medical Officer of Health, September 18, 2015	

FORMS

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

Communicable Diseases and Conditions Report Form

Fill in OR affix addressograph here

Last Name: ______________________________

First Name: ______________________________

Sex: ☐ Male ☐ Female ☐ Other

Date of Birth: ____(DD) ________(month) _____(YYYY)

Chart#: ______________________________

Health Card #: ______________________________

Community of Residence: ____________________

Note: Only use this form for the diseases or conditions listed below. Use disease-specific forms for other notifiable diseases.

1. Reportable Disease or Condition

☐ Acute Flaccid Paralysis	☐ Hemolytic Uremic Syndrome (HUS)	☐ Rabies
☐ Anthrax	☐ Legionellosis	☐ RSV (to report rapid test)
☐ Botulism	☐ Leprosy	☐ SARS
☐ Brucellosis	☐ Listeriosis	☐ Smallpox
☐ Chancroid	☐ Lyme Disease	☐ Tularemia
☐ Cholera	☐ Malaria	☐ Viral hemorrhagic fevers
☐ Creutzfeldt-Jacob Disease (CJD)	☐ Paralytic shellfish poisoning	☐ West Nile Virus
☐ Hantavirus	☐ Plague	☐ Yellow fever

☐ Other (Specify) ____

2. Has laboratory confirmation been sought? ☐ Yes ☐ No

If yes, date of collection (dd/mm/yyyy): ______________________________________

Type of specimen collected (eg. urine, blood): ________________________________

Result if available: ____

3. Illness onset: ______(dd)__________(month)_______(yyyy)

4. Diagnosis date: ______(dd)__________(month)_______(yyyy)

Notes (for healthcare worker use)

____

____

____

____

REPORTING CLINICIAN

Reporter Name:_________________________________ **Reporting Community:** _____________________

Contact Information: _____________________________ **Report Date (dd/mm/yyyy)**___________________

Fax completed form to the Regional CDC:

- Kitikmeot: (867) 983-4088
- Kivalliq: (867) 645-8272
- Qikiqtaaluk: (867) 975-4833

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

Food and Waterborne Illness Investigation Form

Fill in OR affix CASE addressograph here

Last Name: ______________________
First Name: ______________________
Sex: ☐ Male ☐ Female
Date of Birth: ____(DD) ________(month) _____(YYYY)
Chart#: _________________________
Health Card #: _________________________
Community of Residence: ________________

Daycare/School/Institution/Workplace:		**Occupation:**	
Guardian (if child):		**Person Reporting / phone number:**	
Medevac/schedevac due to illness? ☐ Yes ☐ No	**Hospitalised?** ☐ Yes ☐ No	**Admission date (dd/mm/yyyy)**	**Discharge date (dd/mm/yyyy)**

BOX 1 – DISEASE INFORMATION

Symptoms		**Onset date (y/m/d)**	**Duration**
Vomiting	☐	________	________
Diarrhea	☐	________	________
Blood in Stool	☐	________	________
Cramps	☐	________	________
Fever	☐	________	________
Headache	☐	________	________
Blurred Vision	☐	________	________
Dizziness	☐	________	________
Weight Loss	☐	________	________
Jaundice	☐	________	________
Muscle Pain	☐	________	________
Other symptoms:			
	☐	________	________
	☐	________	________

Specimens (stool/vomitus/blood)	**Date Collected (dd/mm/yyyy & time):**
1.	1.
2.	2.
3.	3.

Significant Laboratory results

First Health Centre Visit/Contact Date (yyyy/mm/dd):

Treatment Prescribed:

Any Known Food Allergies?

BOX 2 – MEDICAL HISTORY

Other Known Medical Conditions:

Prescribed Medications/Vitamins/Supplements:

BOX 3 – FOOD/WATER HISTORY AND COMMON SOURCES

Do you often eat:	**Preparation (check all that apply)**	**Where Purchased**
□ Eggs	□ Raw □ Cooked □ Frozen □ Dried	
□ Chicken	□ Raw □ Cooked □ Frozen □ Dried	
□ Turkey	□ Raw □ Cooked □ Frozen □ Dried	
□ Hamburger/Beef	□ Raw □ Cooked □ Frozen □ Dried	
□ Pork	□ Raw □ Cooked □ Frozen □ Dried	
□ Deli Meat	□ Raw □ Cooked	
□ Cheese		
□ Yogurt		
□ Lettuce		
□ Other Raw Vegetables		
□ Fruits		
If patient is infant, are they often fed: □ Breast milk □ Powdered Formula □ Other (specify) _____		

BOX 4 – COUNTRY FOOD

Do you eat:	Preparation (check all that apply)	Source
□ Seal	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?
□ Whale	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?
□ Caribou	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?
□ Walrus	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?
□ Fish	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?
□ Polar Bear	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?
□ Shellfish	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?
□ Duck/Geese/ Ptarmigan	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?
□ Musk Ox	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?
□ Berries/Plants	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?
□ Other _____	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?
□ Other _____	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?
□ Other _____	□ Raw □ Cooked □ Frozen □ Dried □ Fermented	□ Store bought □ Harvested by you □ Harvested by other(s) Where?

BOX 5 – ALL FOODS CONSUMED WITHIN 72 HOURS OF ILLNESS

Morning (72 hours before illness)	Afternoon (72 hours before illness)	Night (72 hours before illness)
Place: Items Consumed: Companions:	Place: Items Consumed: Companions:	Place: Items Consumed: Companions:
Morning (48 hours before illness)	**Afternoon (48 hours before illness)**	**Night (48 hours before illness)**
Place: Items Consumed: Companions:	Place: Items Consumed: Companions:	Place: Items Consumed: Companions:
Morning (24 hours before illness)	**Afternoon (24 hours before illness)**	**Night (24 hours before illness)**
Place: Items Consumed: Companions:	Place: Items Consumed: Companions:	Place: Items Consumed: Companions:

BOX 6 – WATER / DRINK EXPOSURE

Do you normally drink water from **:** □ Tap □ Bottle □ River/Lake □ Melted Ice/Snow

Other than water, what do you often drink? □ Juice □ Milk □ Sports/Energy Drink □ Beer □ Wine □ Spirits (specify)_____
□ Coffee/Tea □ Other (specify)_____

BOX 7 – OTHER EXPOSURES

Community Feast/Family Gathering:	Date **(dd/mm/yyyy)**	# Persons You Knew Attended	#Persons Sick
1)			
2)			

Travel in the past 2 months? □ Yes □ No If "Yes" specify location(s)

BOX 8 – OTHER COMMENTS: Anything Else You Would Like to Tell Us?

Reporter Name:_____ **Reporting Community:** _____

Contact Information: _____ **Report Date (dd/mm/yyyy)**_____

Send completed form to the EHO:

- Kitikmeot: (867) 983-4193
- Kivalliq: (867) 645-8272
- Qikiqtaaluk
  - Arctic Bay, Cape Dorset, Kimmirut, Grise Fiord, Resolute Bay: 867-975-4833
  - All other Qikiqtaaluk communities: 867-473-2657

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

Fax completed form to the Regional CDC, update as necessary:

- Kitikmeot: (867) 983-4088
- Kivalliq: (867) 645-8272
- Qikiqtaaluk: (867) 975-4833

Fill in OR affix CASE addressograph here

Last Name: ____________________
First Name: ____________________
Sex: ☐ Male ☐ Female
Date of Birth: ___(DD) ______(month) ____(YYYY)
Chart#: ____________________
Health Card #: ____________________
Community of Residence: ________________

Bloodborne Infections CONTACT Investigation Form

☐ **Hepatitis B** ☐ **Hepatitis C** ☐ **HIV/AIDS** ☐ **Other**____________________

Date of Diagnosis (dd/mm/yyyy):

Name of Contact (Last, First) List as 'unknown' if contact is not named	DOB (dd/mm/yyyy) [If DOB unknown, Age]	Sex (F/M)	Phone Number(s)	Community/ Address	Date and Type* of Last Contact (dd/mm/yyyy)	Contact Tracing Status**	Lab date and result (dd/mm/yyyy)	Immunization/ Treatment status (if applicable)	Notes/Outcome
			H: C:						
			H: C:						
			H: C:						
			H: C:						
			H: C:						

* **Type of Contact**: **S**= Sexual Partner; **C**=Close contact e.g. household; **N**=Needle sharing i.e. drugs, tattoo, piercing; **O**=Other (describe in notes)
****Contact Tracing Status**: **C**=Complete; **L**=Lost to Follow Up; **X**= Refused; **R**=Referred –note referral site in column

REPORTING CLINICIAN

Reporter Name:____________________
Report Date:____________________
Contact Information:

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé
Nunavut

Fill in OR affix CASE addressograph here

Last Name: ______________________
First Name: ______________________
Sex: □ **Male** □ **Female**
Date of Birth: _____(DD) ______(month) ______(YYYY)
Chart#: _________________________
Health Card #: _________________________
Community of Residence: ___________________

Exposure to Blood and Body Fluids

Case Report & Worksheet for Consultation

If consultation is required send completed form to the Regional CDC

1. Exposure date: ______ (dd)________(month) ________(yyyy)

2. Is the *Exposed* a health care worker or exposed through the nature of their work? ❑ Yes ❑ No
If yes, specify:_________________________________

Was Workers' Safety and Compensation Commission notified? ❑ Yes ❑ No

3. What was the nature of the injury?
❑ Parenteral
❑ Human bite
❑ Non-intact skin exposure
❑ Splash to mucous membranes of eyes, nose or mouth
❑ Other, specify: _________________________________

4. What type of body fluid was involved?
❑ Blood/blood products
❑ Other body fluid, specify: ____
Was the body fluid visibly contaminated with blood? ❑ Yes ❑ No ❑ Unknown

5. Information on the *EXPOSED*:

a. **Did the Exposed consent to testing?** ❑ Yes ❑ No ❑ Unknown

b. **What is the status of the *Exposed* with respect to tetanus vaccine?**
❑ Unvaccinated
❑ Vaccinated: Date of most recent vaccination ____________

c. **Is the Exposed known to have:**

Hepatitis B	❑ Yes	❑ No	❑ Unknown
Hepatitis C	❑ Yes	❑ No	❑ Unknown
HIV	❑ Yes	❑ No	❑ Unknown

d. **What is the status of the *Exposed* with respect to hepatitis B vaccine?**
❑ Unvaccinated
❑ Vaccinated Date;_________________________
Number of Doses: ❑ 1 ❑ 2 ❑ 3
Responder status: ❑ known responder
❑ response unknown ❑ non-responder
❑ Unknown
❑ Other, specify: ___________________

e. **Results from BASELINE BLOOD TEST on *the Exposed*:**

Test	Known positive or protective antibody level	Date collected (dd-mm-yyyy)	Result (titre level)	Comments
HBsAg	❑ Yes* ❑ No	___-___-____		
Anti-HBs	❑ Yes* ❑ No	___-___-____		
Anti-HCV	❑ Yes* ❑ No	___-___-____		
HIV antibody	❑ Yes* ❑ No	___-___-____		

*****Do not retest (HBsAg = Hepatitis B Surface Antigen, Anti-HBS = Hepatitis B Surface Antibody)

6. Information on the *SOURCE*:

a. **Is the *Source* known?** ❑ Yes ❑ No

b. **What is known of the status of the *Source* with respect to:**

Test	Known status	Most recent test date (dd-mm-yyyy)	Result	Unknown	Comments
HBsAg	❑ Yes* ❑ No	___-___-____		❑	
Anti-HBs	❑ Yes* ❑ No	___-___-____		❑	
Anti-HCV	❑ Yes* ❑ No	___-___-____		❑	
HIV antibody	❑ Yes* ❑ No	___-___-____		❑	

*****Do not retest

c. **Does the Source have any of the following risk factors?**

	Yes	No	Refused	Unknown	Comments
From an HBV endemic region	❑	❑	❑	❑	
Multiple sexual partners	❑	❑	❑	❑	
Partner HBV positive or at risk	❑	❑	❑	❑	
HBV positive household contact	❑	❑	❑	❑	
Injection drug use	❑	❑	❑	❑	
Tattoos or piercings	❑	❑	❑	❑	

Other, specify:

_____

d. **Did the Source consent to testing?** ❑ Yes ❑ No ❑ Unknown

e. ***Source* results from current episode:**

Test	Known positive or protective antibody level	Date collected (dd-mm-yyyy)	Result	Comments
HBsAg	❑ Yes* ❑ No	___-___-____		
Anti-HBs	❑ Yes* ❑ No	___-___-____		
Anti-HCV	❑ Yes* ❑ No	___-___-____		
HIV antibody	❑ Yes* ❑ No	___-___-____		

*****Do not retest

7. **If the BC Center of Excellence in HIV/AIDS was consulted what were their recommendations?**
   Note this consultation is required in order to access HIV PEP

8. **If the CMOH/DCMOH was consulted what were their recommendations?**

Name and designation of person completing form | Date (dd/mm/yyyy)

RCDC NOTES

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

Fill in OR affix CASE addressograph here

Last Name: _____

First Name: _____

Sex: □ Male □ Female □ Other

Date of Birth: ____(DD) _____(month) _____(YYYY)

Chart#: _____

Health Card #: _____

Community of Residence: _____

Hepatitis B Case Report Form

Case Status:
* Do NOT send forms to territorial office unless this is a new case

☐ Initial	___(DD)___(MM)____(YYYY)	☐ Acute	☐ Chronic	☐ Unknown
☐ Follow-up	___(DD)___(MM)____(YYYY)	☐ Acute	☐ Chronic	☐ Unknown
☐ Final	___(DD)___(MM)____(YYYY)	☐ Acute	☐ Chronic	☐ Unknown

BOX 1.1 – DEMOGRAPHIC INFORMATION

Origin (*check **one** box only, unless specified*):

☐ Canadian Inuit ☐ Canadian Non-Aboriginal ☐ Foreign-born (*specify country of birth*): _____
☐ Canadian Métis ☐ Other Aboriginal (*specify*): _____

BOX 1.2 – REASONS FOR TESTING

Reason for testing (*check all that apply*):
☐ Symptomatic of Hepatitis B
☐ Contact of a case
☐ STI Screening
☐ TB Screening
☐ Other (*specify*): _____

BOX 1.3 – CLINICAL INFORMATION

Hospitalized due to infection: ☐ Yes ☐ No ☐ Unknown
Previously tested positive: ☐ Yes ☐ No ☐ Unknown
If yes, report year _____
Location_____

BOX 1.4 – SYMPTOMS

(Check all that apply)

Symptom	**Onset Date** (dd/mm/yyyy)
☐ None	N/A
☐ Anorexia	
☐ Nausea	
☐ Vomiting	
☐ Abdominal Cramps	
☐ Fatigue	
☐ Other (specify):	

BOX 1.5 – TESTING

	Initial Test		Follow-up Test	
Test Type	**Date Collected** (dd/mm/yyyy)	**Result** (check one)	**Date Collected** (dd/mm/yyyy)	**Result** (check one)
HBsAg (indicates infection)		☐ Positive ☐ Negative ☐ Other _____		☐ Positive ☐ Negative ☐ Other _____
Anti-HBs (immune status)		☐ Positive ☐ Negative ☐ Other _____		☐ Positive ☐ Negative ☐ Other _____
Hepatitis A IgG (immunity)				☐ Positive ☐ Negative ☐ Other _____

Patient: Last Name_____ First Name_____

BOX 1.6 – RISK FACTORS

Risk factors in the 12 months prior to new diagnosis:

***Sexual**:

Sex without a condom:	☐ Yes	☐ No	☐ Unknown
Multiple sex partners:	☐ Yes	☐ No	☐ Unknown
Men who have sex with men:	☐ Yes	☐ No	☐ Unknown
Sex with IDU:	☐ Yes	☐ No	☐ Unknown
Sex with known Hepatitis B case:	☐ Yes	☐ No	☐ Unknown

Other: _____

Medical (indicate when and where in Box 1.7):

Dental Care (last 6-12 months):	☐ Yes	☐ No	☐ Unknown
Diagnostic/surgical procedure:	☐ Yes	☐ No	☐ Unknown
Renal Dialysis:	☐ Yes	☐ No	☐ Unknown

Other:

‡Received blood products/cells/tissues/organs:	☐ Yes	☐ No	☐ Unknown
‡Donated blood products/cells/tissues/organs:	☐ Yes	☐ No	☐ Unknown
Perinatal Transmission:	☐ Yes	☐ No	☐ Unknown
§Injection drug user (IDU):	☐ Yes	☐ No	☐ Unknown
§Needle sharing, eg. IDU/tattoo/piercing:	☐ Yes	☐ No	☐ Unknown
Household contact of Hepatitis B case:	☐ Yes	☐ No	☐ Unknown
Occupational exposure, eg. needle stick:	☐ Yes	☐ No	☐ Unknown

Other (*specify*): _____

* If YES to sexual risk factors, consider testing for chlamydia, gonorrhea, HIV, and syphilis

‡ Query lifetime history and indicate when and where in Box 1.7

§ If YES to IDU and/or needle sharing, test for Hepatitis C

BOX 1.7 – NOTES (for health care worker use)

_____

_____

_____

_____

_____

_____

Bloodborne Infections Contact Investigation Form completed?	☐ Yes	☐ No
Hepatitis A vaccination offered if non-immune?	☐ Yes	☐ No

REPORTING CLINICIAN

Reporter Name:_____ **Contact Information:** _____

Report Date: (dd/mm/yyyy)_____

Fax completed form to the Regional CDC:

o Kitikmeot:	(867) 983-4088
o Kivalliq:	(867) 645-8272
o Qikiqtaaluk:	(867) 975-4833

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

Hepatitis C Case Report Form

Fill in OR affix CASE addressograph here

Last Name: ______________________

First Name: ______________________

Sex: ☐ Male ☐ Female ☐ Other

Date of Birth: ____(DD) ________(month) _____(YYYY)

Chart#: _________________________

Health Card #: _________________________

Community of Residence: ___________________

Case Status:

* Do NOT send forms to territorial office unless this is a new case

☐ Initial ___(DD)___(MM)____(YYYY) ☐ Acute ☐ Chronic ☐ Unknown

☐ Follow-up ___(DD)___(MM)____(YYYY) ☐ Acute ☐ Chronic ☐ Unknown

☐ Final ___(DD)___(MM)____(YYYY) ☐ Acute ☐ Chronic ☐ Unknown

BOX 1.1 – DEMOGRAPHIC INFORMATION

Origin (*check **one** box only, unless specified*):

☐ Canadian Inuit ☐ Canadian Non-Aboriginal ☐ Foreign-born (*specify country of birth*): _____________________

☐ Canadian Métis ☐ Other Aboriginal (*specify*): ____________________________

BOX 1.2 – REASONS FOR TESTING

Reason for testing (*check all that apply*):

☐ Symptomatic of Hepatitis C
☐ Contact of a case
☐ STI Screening
☐ TB Screening
☐ Other (*specify*): __________________________

BOX 1.3 – CLINICAL INFORMATION

Hospitalized due to infection: ☐ Yes ☐ No ☐ Unknown

Previously tested positive: ☐ Yes ☐ No ☐ Unknown

If yes, report year _________________

Location_________________________

BOX 1.4 – SYMPTOMS

(Check all that apply)

Symptom	Onset Date (dd/mm/yyyy)
☐ None	N/A
☐ Anorexia	
☐ Nausea	
☐ Vomiting	
☐ Abdominal Cramps	
☐ Fatigue	
☐ Other (specify):	

BOX 1.5 – TESTING

	Initial Test		Follow-up Test	
Test Type	**Date Collected** (dd/mm/yyyy)	**Result** (check one)	**Date Collected** (dd/mm/yyyy)	**Result** (check one)
Anti-HCV		☐ Positive ☐ Negative ☐ Other ______________		☐ Positive ☐ Negative ☐ Other ______________
HCV RNA If recommended by physician		☐ Positive ☐ Negative ☐ Other ______________		☐ Positive ☐ Negative ☐ Other ______________
HBs Ag (infection)		☐ Positive ☐ Negative ☐ Other ______________		☐ Positive ☐ Negative ☐ Other ______________
Anti-HBs (immunity)		☐ Positive ☐ Negative ☐ Other ______________		☐ Positive ☐ Negative ☐ Other ______________
Hepatitis A IgG (immunity)		☐ Positive ☐ Negative ☐ Other ______________		☐ Positive ☐ Negative ☐ Other ______________

Patient: Last Name_____ First Name_____

BOX 1.6 – RISK FACTORS

Risk factors in the 12 months prior to new diagnosis:

***Sexual**:			
Sex without a condom:	☐ Yes	☐ No	☐ Unknown
Multiple sex partners:	☐ Yes	☐ No	☐ Unknown
Men who have sex with men:	☐ Yes	☐ No	☐ Unknown
Sex with IDU:	☐ Yes	☐ No	☐ Unknown
Sex with known Hepatitis C case:	☐ Yes	☐ No	☐ Unknown
Other: _____			
Medical (indicate when and where in Box 1.7):			
Dental Care (last 6-12 months):	☐ Yes	☐ No	☐ Unknown
Diagnostic/surgical procedure:	☐ Yes	☐ No	☐ Unknown
Renal Dialysis:	☐ Yes	☐ No	☐ Unknown
Other:			
‡Received blood products/cells/tissues/organs:	☐ Yes	☐ No	☐ Unknown
‡Donated blood products/cells/tissues/organs:	☐ Yes	☐ No	☐ Unknown
Perinatal Transmission:	☐ Yes	☐ No	☐ Unknown
Injection drug user (IDU):	☐ Yes	☐ No	☐ Unknown
Needle sharing, eg. IDU/tattoo/piercing:	☐ Yes	☐ No	☐ Unknown
Household contact of Hepatitis C case:	☐ Yes	☐ No	☐ Unknown
Occupational exposure, eg. needle stick:	☐ Yes	☐ No	☐ Unknown
Other (*specify*): _____			

* If YES to sexual risk factors, consider testing for chlamydia, gonorrhea, HIV, and syphilis
‡ Query lifetime history and indicate when and where in Box 1.7

BOX 1.7 – NOTES (for health care worker use)

_____

_____

_____

_____

_____

_____

Bloodborne Infections Contact Investigation Form completed?	☐ Yes	☐ No
Hepatitis A and B vaccination offered if non-immune?	☐ Yes	☐ No

REPORTING CLINICIAN

Reporter Name:_____ **Contact Information:** _____

Report Date: (dd/mm/yyyy)_____

Fax completed form to the Regional CDC:

o Kitikmeot:	(867) 983-4088
o Kivalliq:	(867) 645-8272
o Qikiqtaaluk:	(867) 975-4833

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

Fax completed form to the Regional CDC update as necessary:

- Kitikmeot: (867) 983-4088
- Kivalliq: (867) 645-8272
- Qikiqtaaluk (867) 975-4833

Fill in OR affix CASE addressograph here

Last Name: ____________________

First Name: ____________________

Sex: ☐ Male ☐ Female

Date of Birth: ____(DD) ________(month) _____(YYYY)

Chart#: ____________________

Health Card #: ____________________

Community of Residence: ________________

Sexually Transmitted Infection (STI) CONTACT Investigation Form

Disease: ☐ **Chancroid** ☐ **Chlamydia** ☐ **Gonorrhea** ☐ **Syphilis – Stage**________________

Date of Diagnosis (dd/mm/yyyy):

Name of Contact (Last, First) List as 'unknown' if contact is not named	DOB (dd/mm/yyyy) [If DOB unknown, Age]	Sex (M/F)	Phone Number(s)	Community/ Address	Date of Last Sexual Contact (dd/mm/yyyy)	Tracing Status* (C, L, or R)	Date of lab (dd/mm/yyyy)	Empiric Treatment	Notes
			H: C:		☐ Vaginal________ ☐ Oral__________ ☐ Anal__________			☐ No ☐ Yes	☐ case ☐ not a case
			H: C:		☐ Vaginal________ ☐ Oral__________ ☐ Anal__________			☐ No ☐ Yes	☐ case ☐ not a case
			H: C:		☐ Vaginal________ ☐ Oral__________ ☐ Anal__________			☐ No ☐ Yes	☐ case ☐ not a case
			H: C:		☐ Vaginal________ ☐ Oral__________ ☐ Anal__________			☐ No ☐ Yes	☐ case ☐ not a case
			H: C:		☐ Vaginal________ ☐ Oral__________ ☐ Anal__________			☐ No ☐ Yes	☐ case ☐ not a case

* **Contact Tracing Status**: **C**=Complete; **L**=Lost to Follow Up; **R**=Referred – If Referred, note referral community in column

STI	Stage (syphilis only)	Length of time for contact tracing
Chlamydia	-	60 days
Gonorrhea	-	60 days
Chancroid	-	2 weeks prior to symptom onset
Syphilis*	Primary	3 months prior to symptom onset
	Secondary	6 months prior to symptom onset
	Early latent	1 year prior to diagnosis
	Late latent	Assess marital or long-term partners & children
	Congenital	Assess mother & her sexual partner(s)
	Stage undetermined	Assess in consultation with colleague experienced in syphilis management

REPORTING CLINICIAN

Reporter Name:______________________________

Report Date:______________________________

Contact Information:

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

Chlamydia and Gonorrhea Report Form

Fill in OR affix CASE addressograph here

Last Name: ______________________
First Name: ______________________
Sex: ☐ Male ☐ Female
Date of Birth: ____(DD) ________(month) _____(YYYY)
Chart#: _________________________
Health Card #: _________________________
Community of Residence: ___________________

Reason for screening* ☐ Symptomatic ☐ Contact ☐ Routine ☐ Prenatal
☐ Test of Cure ☐ Other____

Reason for treatment ☐ Empiric ☐ Positive lab

☐ Not treated, specify reason:

☐ Refused treatment
☐ Pending lab
☐ Lost to follow-up
☐ Other_________________________

Infection	Date Tested dd/mm/yyyy	Preferred Treatment Date ___-____-___	Alternative Treatment Date ___-____-___
Chlamydia	____-_____-____	Adults (non-pregnant and non-lactating) with urethral, endocervical, rectal, pharyngeal infection ☐ Azithromycin 1g PO x 1	Adults (non-pregnant and non-lactating) with urethral, endocervical, rectal, pharyngeal infection ☐ Doxycycline 100 mg PO BID x 7 days
		Pregnant and breastfeeding women ☐ Azithromycin 1 g PO x 1 OR ☐ Amoxicillin 500 mg PO TID x 7 days	---
		Adults and children (> 9 years) Eye Infection ☐ Doxycycline 100 mg PO BID x 14 days	Adults and children (> 9 years) Eye Infection Azithromycin 1 g PO x 1
Gonorrhea	____-_____-____	Heterosexual adults and pregnant women: any site ☐ Cefixime 800mg PO x 1 PLUS Azithromycin 1 g PO x 1	Heterosexual adults and pregnant women: any site ☐ Spectinomycin 2 g IM x 1 PLUS Azithromycin 1 g PO x 1 OR ☐ Azithromycin 2 g PO x 1
		Pharyngeal infections and Men who have sex with men: any site and pharyngeal ☐ Ceftriaxone 250 mg IM x 1 PLUS Azithromycin 1 g PO x 1	Pharyngeal infections and Men who have sex with men: any site and pharyngeal ☐ Cefixime 800 mg PO x 1 PLUS Azithromycin 1 g PO x1 OR ☐ Azithromycin 2 g PO x 1

See Canadian Guidelines on Sexually Transmitted Infections (January 2010 or later – http://www.phac-aspc.gc.ca/std-mts/sti-its/)
Note: Partner identification and treatment is essential to prevent re-infection.

Sexually Transmitted Infection (STI) Contact Investigation Form completed ☐ Yes ☐ No

REPORTING CLINICIAN

Reporter Name:___________________________ **Contact Information:** ________________________ **Report Date**_________

Fax completed form to the <u>Regional CDC</u>: <u>within 24 hours, update as necessary</u>

- Kitikmeot: (867) 983-4088
- Kivalliq: (867) 645-8272
- Qikiqtaaluk: (867) 975-4833

Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble

Please fill in OR addressograph/affix label

Last Name: _____
First Name: _____
Sex: ☐ Male ☐ Female ☐ Other
Date of Birth: ____(DD) _____(month) _____(YYYY)
Chart#: _____
Health Card #: _____
Community of Residence: _____

SYPHILIS ASSESSMENT REPORT FORM

For use by front line health care providers; please fax to RCDC

Date of Assessment (DDMMYY): ___ ___ - ___ ___ - ___ ___
Case ID: *(assign after lab-confirmation)* _____

BOX 1.1 - DEMOGRAPHIC INFORMATION

Ethnicity (*check **one** box only, unless specified*)

☐ Canadian Inuit ☐ Canadian Non-Aboriginal ☐ Foreign-born (*specify country*): _____
☐ Canadian Métis ☐ Other Canadian Aboriginal (*specify*): _____
Communities lived in the past year (*specify all*): _____
Reporting community: _____
If visiting Nunavut, place of residency: _____

BOX 1.2 - REASON FOR TESTING

☐ Symptomatic of syphilis
☐ Contact of a case
☐ Prenatal screen
☐ STI screen
☐ Other routine screen (including pap smear)
☐ Other (*specify*): _____

BOX 1.3 – CLINICAL HISTORY

Previous Syphilis diagnosis?
☐ Yes Year(s) of previous diagnosis: _____ ☐ No ☐ Unknown
Stage of previous diagnosis: _____
Date of last serology: ___ ___-___ ___-___ ___

Pregnant: ☐ Yes (due date :___ ___-___ ___-___ ___) ☐ No ☐ Unknown
Date of most recent possible exposure: ___ ___-___ ___-___ ___

BOX 1.4 - TRAVEL

Travel 12 months prior to diagnosis:
☐ Yes ☐No ☐ Unknown

Sexual contact during travel:
☐ Yes ☐No ☐ Unknown
If Yes, ***specify communities***:

BOX 1.5 – SIGNS AND SYMPTOMS

Physical exam done: ☐ Yes ☐ No ☐ Unknown

Typical Stage	Symptom	Onset date (*specify date if known*)	
		Current or in last 3 months	More than 3 months ago
Primary	☐ Chancre- genital	☐	☐
	☐ Chancre- mouth/lips	☐	☐
	☐ Local lymphadenopathy	☐	☐
Secondary	☐ General lymphadenopathy	☐	☐
	☐ Condyloma lata	☐	☐
	☐ Rash hands	☐	☐
	☐ Rash feet	☐	☐
	☐ Rash trunk	☐	☐
	☐ Rash other: _____	☐	☐
Other	☐ Fever or cold-like symptoms	☐	☐
	☐ Neurological	☐	☐
	☐ Other: _____	☐	☐
Latent	☐ Asymptomatic	☐	☐

BOX 1.6 – RISK FACTORS

Risk factors in the 12 months prior to diagnosis:

Exchange of sex for money/drugs	☐ Yes	☐ No
Been in jail/juvenile detention	☐ Yes	☐ No
Injection drug user (IDU)	☐ Yes	☐ No
Sex with IDU	☐ Yes	☐ No
Men who have sex with men	☐ Yes	☐ No
Sex without a condom	☐ Yes	☐ No
Multiple sex partners	☐ Yes	☐ No
History of other STI	☐ Yes	☐ No
Use of alcohol or drugs	☐ Yes	☐ No
Under-housed/unstable housing	☐ Yes	☐ No

BOX 1.7 INITIAL TESTING - all lab results must be sent to RCDC

Date Blood drawn	Test	Result: check one box, update as necessary			
___ ___-___ ___-___ ___	Syphilis EIA	☐ Positive	☐ Negative	☐ Pending	☐ Indeterminate
	RPR titer	☐ Positive -RPR:	☐ Negative	☐ Pending	☐ Indeterminate
	Syphilis confirmatory test	☐ Positive	☐ Negative	☐ Pending	☐ Indeterminate
	HIV (Required to determine treatment)	☐ Positive	☐ Negative	☐ Pending	☐ Indeterminate

Case name: _____

BOX 1.8 – STAGING Please check off the correct stage to guide treatment. Refer to the *Syphilis Public Health Protocol* of the Nunavut Communicable Disease Manual (February 2013 or later). **If unsure of staging, you must contact RCDC or other clinician**.

Stage	Rationale for Stage *(check all that apply)*
☐ **No stage assigned: sexual contact of a case**	
☐ Primary	☐ Current symptoms consistent with primary (genital/ mouth chancre, reg. lymphadenopathy) ☐ Only exposure to a case was within last three months
☐ Secondary	☐ Current symptoms consistent with secondary (rash, condyloma lata, general lymphadenopathy) ☐ History consistent with previous primary symptoms (ex. A genital chancre that healed several weeks prior) ☐ Exposure to a case was between 2 weeks and 6 months ago
☐ Early Latent	☐ <1 year: Contact with a case **within the past year** ☐ Asymptomatic
☐ Late Latent	☐ ≥1 year: Contact with a case **more than a year ago** ☐ Asymptomatic
☐ Latent Unknown Duration	☐ Asymptomatic, date of last contact with a case **unknown**
☐ Tertiary	☐ Symptoms consistent with tertiary (cardiovascular, neurological, tissue destruction)

BOX 1.9 – TREATMENT Refer to *Syphilis Public Health Protocol* of the Nunavut Communicable Disease Manual (February 2013 or later)

Stage	Client Type	Treatment (check off)	Dose**	Date(s) Given
For **all pregnant patients**, consult with a specialist (Infectious disease, pediatrician, and/or obstetrician) prior to treatment.				
Sexual Contact of a Case **OR** Primary, Secondary, or Early Latent Case	Non- Pregnant, HIV-	☐ Long-acting Benzathine penicillin G (Bicillin-LA)	2.4 MU comprised of 2 separate **IM** injections of 1.2 MU each. Dose is **once only.**	1.
		☐ **For penicillin allergies only**: Doxycycline	100mg po BID for 14 days	
	Pregnant, HIV-	☐ Long-acting Benzathine penicillin G (Bicillin-LA)	2.4 MU comprised of 2 separate **IM** injections of 1.2 MU each. **Repeat** dose weekly **for 2 weeks.**	1. 2.
Late Latent **OR** Latent Unknown Duration Case	Non-Pregnant, HIV-	☐ Long-acting Benzathine penicillin G (Bicillin-LA)	2.4 MU comprised of 2 separate **IM** injections of 1.2 MU each. **Repeat** dose weekly **for 3 consecutive weeks.**	1. 2. 3.
		☐ **For penicillin allergies only**: Doxycycline	100mg po BID for 28 days	
	Pregnant, HIV-	☐ Long-acting Benzathine penicillin G (Bicillin-LA)	2.4 MU comprised of 2 separate **IM** injections of 1.2 MU each. **Repeat** dose weekly **for 3 consecutive weeks.**	1. 2. 3.
Tertiary, neuro, HIV+, or congenital	Must consult a specialist (Infectious Disease, Pediatrician and/or Obstetrician) prior to treatment.			
**Refer to Alternative Treatment for Penicillin-allergic Patients in the *Nunavut Communicable Disease Manual* (February 2013 or later)			** MU=million units	

BOX 2.0 – POST TREATMENT ASSESSMENT- RPR TITRES

Client Type	1 month	3 months	6 months	12 months	24 months
Primary, Secondary, Early Latent	Repeat HIV test	Repeat HIV test			
Late/Unknown Latent, Tertiary					
Neurosyphilis; HIV+, Pregnancy; Congenital	Refer to the *Nunavut Syphilis Public Health Protocol* (February 2013 or later) and consult with a specialist (Infectious Disease, Pediatrician and/or Obstetrician).				
Sexual Contact	Redo syphilis test if initial test is EIA-				

For **cases**: *STI Contact Investigation Form*
Complete? ☐ Yes ☐ No

FOR CONFIRMED CASES ONLY:
Fax this form and contact tracing list to the Regional CDC within 24 hours:
Qikiqtaaluk: (867) 975-4833
Kitikmeot: (867) 983-4088
Kivalliq: (867) 645-8272

REPORTING CLINICIAN

Name:	Contact Information:	Report Date:

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Please fill in OR addressograph/affix label

Last Name: _____
First Name: _____
Sex: □ Male □ Female □ Other
Date of Birth: ____(DD) _____(month) _____(YYYY)
Chart#: _____
Health Card #: _____
Community of Residence: _____

SYPHILIS CASE SUMMARY REVIEW FORM

Case ID:
(*For cases only*) ___ ___ - ___ ___ - ___ ___ ___

BOX 1.1 – DIAGNOSIS

Date of diagnosis: ___ ___ - ___ ___ - ___ ___
Prenatal: ☐ No ☐ Yes → Infant chart #:_____

BOX 1.2 – CONTACT TRACING

Total # contacts traced: _____
Total # contacts who are cases: _____

BOX 1.3 - TREATMENT

Benzathine penicillin G (Bicillin LA): ☐ 1 dose ☐ 2 doses ☐ 3 doses
Doxycycline (for penicillin allergies only): ☐ 14 days ☐ 28 days
Other (specify): _____

Patient Noncompliance issues: ☐ No ☐ Yes →
If yes, describe:

BOX 1.4 – SEROLOGICAL MONITORING OF RPR TITER

Staging	Adequate Serological Response- RPR Titer
☐ Primary	4 fold reduction in 6 months, 8 fold reduction in 12 mo.
☐ Secondary	8 fold reduction in 6 months, 16 fold reduction in 12 mo.
☐ Early latent	4 fold reduction by 12 mo.
☐ Late latent	4 fold reduction by 6 mo., may sero-fast*
☐ Latent unknown duration	May not see significant reduction if initial RPR was low, may sero-fast*
☐ Tertiary	See patient file, consult specialist
☐ Possible congenital (baby born to seropositive mother)	See Canadian Guidelines for STIs, Table 8b, consult RCDC

RPR Titer Tracking Chart

#	Date	RPR	Notes
1		1:_____	
2		1:_____	
3		1:_____	
4		1:_____	
5		1:_____	
6		1:_____	

RPR results from least infectious to most infectious:
1, 2, 4, 8, 16, 32, 64, 128, 256, >256

A 4-fold reduction is equivalent to a 2-step/tube drop (ex. Changing from 1:32 to 1:8). If titer increases by two steps/tubes, this could indicate reinfection or treatment failure. * Sero-fast occurs when titer remains at a steady low level.

BOX 1.5 – OUTCOME

- ☐ **Treatment complete with adequate serological response**
- ☐ **Treatment complete with sero-fast**
- ☐ **Transferred or referred**
- ☐ **Lost to follow up**
- ☐ **Post treatment RPR increase indicating reinfection:**
  - ↳ fill out new Assessment form for new instance of syphilis

INITIAL LAB CONFIRMATION RECORD

	Date	Result
Diagnostic EIA		
Diagnostic RPR (Month 0)		1 : _____
Confirmatory test		

REPORTING CLINICIAN
Name: **Contact Information:** **Report Date:** ___ ___ - ___ ___ - ___ ___

Notes:

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

Fill in OR affix CASE addressograph here

Last Name: ______________________
First Name: ______________________
Sex: ☐ Male ☐ Female ☐ Other
Date of Birth: ____(DD) _______(month) _____(YYYY)
Chart#: _________________________
Health Card #: ________________________
Community of Residence: __________________

Vaccine Preventable Disease Report Form

DISEASE

☐ Diphtheria ☐ Measles ☐ Mumps ☐ Pertussis ☐ Poliomyelitis ☐ Rubella ☐ Tetanus ☐ Varicella

DIAGNOSIS

☐ Lab-confirmed case (Clinical illness + lab confirmation)
☐ Clinically-confirmed case (Clinical illness + link to known case)
☐ Probable case (Clinical illness only)

BOX 1.1 – DEMOGRAPHIC INFORMATION

Origin: ☐ Inuit ☐ Other Canadian Aboriginal (*specify*): ______________________ ☐ Canadian Non-Aboriginal

☐ Foreign-born (*specify country of birth*): ________________________________

Case Factors: ☐ Healthcare worker ☐ Attends childcare, school, *specify***:** _________________________________

Travel within or outside territory within the last month prior to diagnosis: ☐ Yes ☐No ☐ Unknown
If yes, *specify* ____

BOX 1.2 – LABORATORY TESTING

Date of collection (dd-mm-yyyy): ___________________
Type of specimen (eg. swab, blood): _______________
____
Result if available: ____________________________
____

BOX 1.3 – CLINICAL INFORMATION

Onset date of first symptoms (dd-mm-yyyy):
____
Symptoms (*specify*):____________________________
____
____
____

BOX 1.4 – IMMUNIZATION HISTORY FOR DISEASE BEING REPORTED

☐ None ☐ Unknown

Vaccine Name	Date received (dd-mm-yyyy)

BOX 1.5 - TREATMENT INITIATED (if applicable)

☐ None

Treatment Given	Date (dd-mm-yyyy)

Vaccine Preventable Disease (VPD) Contact Investigation Form completed ☐ Yes ☐ No

REPORTING CLINICIAN

Reporter Name:_________________________________ Reporting Community: ________________________
Contact Information: ____________________________ Report Date (dd/mm/yyyy)______________________

Send completed form to the RCDC:

Kitikmeot: (867) 983-4088
Kivalliq: (867) 645-8272
Qikiqtaaluk: (867) 975-4833

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Fax completed form to the Regional CDC, update as necessary:

- o Kitikmeot: (867) 983-4088
- o Kivalliq: (867) 645-8272
- o Qikqtaaluk: (867) 975-4833

Fill in OR affix CASE addressograph here

Last Name: _____
First Name: _____
Sex: □ **Male** □ **Female**
Date of Birth: ____(DD) _____(month) _____(YYYY)
Chart#: _____
Health Card #: _____
Community of Residence: _____

Vaccine Preventable Disease (VPD) CONTACT Investigation Form

Disease: ☐ **Diphtheria** ☐ **Measles** ☐ **Mumps** ☐ **Pertussis** ☐ **Poliomyelitis** ☐ **Rubella** **Date of Diagnosis** (dd/mm/yyyy)**:**

Name of Contact (Last Name, First Name) List as 'unknown' if contact is not named	DOB (dd/mm/yyyy) [If DOB unknown, Age]	Sex (M/F)	Phone Number(s)	Community/ Address	Date and type** of Contact (dd/mm/yyyy)	Tracing Status* (C, L, or R)	Date of lab (dd/mm/yyyy)	Treatment/ Prophylaxis	Notes
			H: C:		☐ Household_____ ☐ Close_____ ☐ Other_____				
			H: C:		☐ Household_____ ☐ Close_____ ☐ Other_____				
			H: C:		☐ Household_____ ☐ Close_____ ☐ Other_____				
			H: C:		☐ Household_____ ☐ Close_____ ☐ Other_____				
			H: C:		☐ Household_____ ☐ Close_____ ☐ Other_____				

*** Contact Tracing Status**: **C**=Complete; **L**=Lost to Follow Up; **X**= Refused; **R**=Referred – If Referred, note referral community in column

Type of Contact: **Household = live in same home or attend daycare; **Close** = shared respiratory secretions, shared confined airspace >1hour; If other, specify in notes

REPORTING CLINICIAN

Reporter Name: _____

Report Date: _____

Contact Information: _____

BACTERIAL DISEASES SURVEILLANCE FORM – *Haemophilus influenzae*

Please complete this form and fax to the RCDC (Qikiqtaaluk: 975-4833; Kitikmeot: 983-4088; Kivalliq: 645-8272).

1. Name: _____ **2. Sex**: ☐ Male ☐ Female
Last, First, MI

3. Birthdate: _____ **or Age**: _____ years or _____ months
DD/MM/YYYY

4. Ethnicity: ☐ First Nations ☐ Inuit ☐ Metis ☐ Non Aboriginal ☐ Unknown

5. Village: _____ **6. Region:** ☐ Labrador ☐ NWT ☐ Nunavut ☐ Yukon ☐ Quebec (Cree) ☐ Quebec (Nunavik)

7. Reference lab accession #: _____

8. Source of positive isolate(s) from sterile site(s): ☐ Blood ☐ Pleural fluid ☐ Pericardial fluid ☐ Bone ☐ CSF ☐ Peritoneal fluid ☐ Joint ☐ Other _____

9. Date first positive culture obtained (date specimen drawn): _____
DD/MM/YYYY

10. Hospitalized? ☐ Yes ☐ No **If yes, answer questions 11-16. 11. Facility**: _____

12. Admitted: _____ **13. Transferred?** ☐ Yes ☐ No **14. Final discharge**: _____
DD/MM/YYYY DD/MM/YYYY

15. Date Transferred **16. Facility Name(s)**

_____ _____

17. Organism: ***Haemophilus influenzae*** **18. Death during this illness?** ☐ Yes ☐ No **19. Date of death**: _____
DD/MM/YYYY

20. Infection(s) caused by organism: *(Check ALL pertinent diagnoses)*

☐ Amnionitis ☐ Empyema ☐ Epiglottitis ☐ Osteomyelitis ☐ Pneumonia
☐ Bacteremia ☐ Endocarditis ☐ Hemolytic uremic syndrome ☐ Pericarditis ☐ Septic abortion
☐ Cellulitis ☐ Endometritis ☐ Meningitis ☐ Peritonitis ☐ Septic arthritis
☐ Other (please specify): _____

21. Other concurrent INFECTIOUS illnesses: ☐ None ☐ No info available Specify other: _____

22. Underlying conditions or illnesses: ☐ None ☐ No info available

☐ Alcohol abuse ☐ Chronic renal failure ☐ Homelessness ☐ Pregnancy/post partum ☐ Trauma
☐ Asthma/RAD ☐ Cirrhosis/liver failure ☐ IVDU ☐ Premature infant
☐ Asplenia ☐ Congestive heart failure ☐ Immunodeficiency disease ☐ Rheumatoid arthritis
☐ Cancer ☐ CSF leak ☐ Immunosuppressive thereapy ☐ Smoker (within past year)
☐ Chronic lung disease ☐ Diabetes ☐ Nephrotic syndrome ☐ Stroke/CVA
☐ Other conditions/illnesses (please specify): _____

23. Has patient received *Haemophilus influenzae* b (Hib) conjugate vaccine?
☐ Yes ☐ No ☐ Unk

24. If yes, date(s) given: (1) _____ (2) _____ (3) _____ 4) _____
DD/MM/YYYY DD/MM/YYYY DD/MM/YYYY DD/MM/YYYY

25. Reviewer: _____ 26**. Reviewer phone:** _____ **27. Date complete**: _____

28. Comments:

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Fax completed form to the Regional CDC
Update as necessary:

- Kitikmeot: (867) 983-4088
- Kivalliq: (867) 645-8272
- Qikiqtaaluk: (867) 975-4833

Fill in OR affix CASE addressograph here

Last Name: _____
First Name: _____

Sex: □ **Male** □ **Female**

Date of Birth: ___(DD) _____(month) ____(YYYY)

Chart#: _____
Health Card #: _____

Community of Residence: _____

Invasive *Haemophilus influenzae* Disease (Hi) CONTACT Investigation Form

Date (dd/mm/yyyy)	**Name**	**DOB or Age** (dd/mm/yyyy)	**Phone #**	**Date & Type of Contact** (dd/mm/yyyy)	**Immunization Status for contacts <4 years of age**	**Prophylaxis Recommended**
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No

BACTERIAL DISEASES SURVEILLANCE FORM – *Streptococcus agalactiae* (Group B)

Please complete this form and fax to the RCDC (Qikiqtaaluk: 975-4833; Kitikmeot: 983-4088; Kivalliq: 645-8272).

1. Name: _____ **2. Sex**: ☐ Male ☐ Female
Last, First, MI

3. Birthdate: _____ **or Age**: _____ years or _____ months or days _____
DD/MM/YYYY

4. Ethnicity: ☐ First Nations ☐ Inuit ☐ Metis ☐ Non Aboriginal ☐ Unknown

5. Village: _____ **6. Region:** ☐ Labrador ☐ NWT ☐ Nunavut ☐ Yukon ☐ Quebec (Cree) ☐ Quebec (Nunavik)

7. Reference lab accession #: _____

8. Source of positive isolate(s) from sterile site(s): ☐ Blood ☐ Pleural fluid ☐ Pericardial fluid ☐ Bone ☐ CSF ☐ Peritoneal fluid ☐ Joint ☐ Other _____

9. Date first positive culture obtained (date specimen drawn): _____
DD/MM/YYYY

10. Hospitalized: ☐ Yes ☐ No **If yes, answer questions 11-16.** **11. Facility**: _____

12. Admitted: _____ **13. Transferred?** ☐ Yes ☐ No **14. Final discharge**: _____
DD/MM/YYYY DD/MM/YYYY

15. Date Transferred **16. Facility Name(s)**

_____ _____

17. Organism: ***Streptococcus agalactiae*** **(Group B)** **18. Death during this illness?** ☐ Yes ☐ No **19. Date of death**: _____
DD/MM/YYYY

20. Infection(s) caused by organism: *(Check ALL pertinent diagnoses)*

☐ Amnionitis ☐ Empyema ☐ Epiglottitis ☐ Osteomyelitis ☐ Pneumonia
☐ Bacteremia ☐ Endocarditis ☐ Hemolytic uremic syndrome ☐ Pericarditis ☐ Septic abortion
☐ Cellulitis ☐ Endometritis ☐ Meningitis ☐ Peritonitis ☐ Septic arthritis
☐ Other (please specify): _____

21. Other concurrent INFECTIOUS illnesses: ☐ None ☐ No info available Specify other: _____

22. Underlying conditions or illnesses: ☐ None ☐ No info available

☐ Alcohol abuse ☐ Chronic renal failure ☐ Homelessness ☐ Pregnancy/post partum ☐ Stroke/CVA
☐ Asthma/RAD ☐ Cirrhosis/liver failure ☐ IVDU ☐ Premature infant ☐ Trauma
☐ Asplenia ☐ Congestive heart failure ☐ Immunodeficiency disease ☐ Rheumatoid arthritis
☐ Cancer ☐ CSF leak ☐ Immunosuppressive therapy ☐ Smoker (within past year)
☐ Chronic lung disease ☐ Diabetes ☐ Nephrotic syndrome ☐ Surgery/surgical wound
☐ Other conditions/illnesses (please specify): _____

23. Reviewer: _____ 24**. Reviewer phone:** _____ **25. Date complete**: _____

26. Comments:

PHAC use only

BACTERIAL DISEASES SURVEILLANCE FORM – *Streptococcus pyogenes* (Group A)

Please complete this form and fax to the RCDC (Qikiqtaaluk: 975-4833; Kitikmeot: 983-4088; Kivalliq: 645-8272).

1. Name: _____ **2. Sex**: ☐ Male ☐ Female
Last, First, MI

3. Birthdate: _____ **or Age**: _____ years or _____ months
DD/MM/YYYY

4. Ethnicity: ☐ First Nations ☐ Inuit ☐ Metis ☐ Non Aboriginal ☐ Unknown

5. Village: _____ **6. Region:** ☐ Labrador ☐ NWT ☐ Nunavut ☐ Yukon ☐ Quebec (Cree) ☐ Quebec (Nunavik)

7. Reference lab accession #: _____

8. Source of positive isolate(s) from sterile site(s): ☐ Blood ☐ Pleural fluid ☐ Pericardial fluid ☐ Bone ☐ Surgical aspirate ☐ CSF ☐ Peritoneal fluid ☐ Joint ☐ Surgical specimen ☐ Other _____

9. Date first positive culture obtained (date specimen drawn): _____
DD/MM/YYYY

10. Hospitalized? ☐ Yes ☐ No **If yes, answer questions 11-16. 11. Facility**: _____

12. Admitted: _____ **13. Transferred?** ☐ Yes ☐ No **14. Final discharge**: _____
DD/MM/YYYY DD/MM/YYYY

15. Date Transferred **16. Facility Name(s)**

_____ _____

17. Organism: ***Streptococcus pyogenes*** **(Group A)** **18. Death during this illness?** ☐ Yes ☐ No **19. Date of death**: _____
DD/MM/YYYY

20. Infection(s) caused by organism: *(Check ALL pertinent diagnoses)*

☐ Amnionitis ☐ Endocarditis ☐ Meningitis ☐ Pericarditis ☐ Septic abortion
☐ Bacteremia ☐ Endometritis ☐ Necrotizing fasciitis ☐ Peritonitis ☐ Septic arthritis
☐ Cellulitis ☐ Epiglottitis ☐ Osteomyelitis ☐ Pneumonia ☐ Streptococcal toxic shock syndrome
☐ Empyema ☐ Hemolytic uremic syndrome
☐ Other (please specify): _____

21. Other concurrent INFECTIOUS illnesses: ☐ None ☐ No info available Specify other: _____

22. Underlying conditions or illnesses: ☐ None ☐ No info available

☐ Alcohol abuse ☐ Chronic renal failure ☐ Homelessness ☐ Nephrotic syndrome ☐ Stroke/CVA
☐ Asthma/RAD ☐ Cirrhosis/liver failure ☐ IVDU ☐ Pregnancy/post partum ☐ Trauma
☐ Asplenia ☐ Congestive heart failure ☐ Immunodeficiency disease ☐ Rheumatoid arthritis ☐ Varicella
☐ Cancer ☐ CSF leak ☐ Immunosuppressive therapy ☐ Smoker (within last year)
☐ Chronic lung disease ☐ Diabetes ☐ Kidney dialysis ☐ Surgery/surgical wound
☐ Other conditions/illnesses (please specify): _____

23. Reviewer: _____ **24. Reviewer phone:** _____ **25. Date complete**: _____

26. Comments:

PHAC use only

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

Fax completed form to the Regional CDC
Update as necessary:

- o Kitikmeot: (867) 983-4088
- o Kivalliq: (867) 645-8272
- o Qikiqtaaluk: (867) 975-4833

Fill in OR affix CASE addressograph here

Last Name: _____
First Name: _____

Sex: □ Male □ Female

Date of Birth: ___(DD) _____(month) ____(YYYY)

Chart#: _____
Health Card #: _____

Community of Residence: _____

Invasive Group A Streptococcal Disease (iGAS) CONTACT Investigation Form

Date (dd/mm/yyyy)	**Name**	**DOB or Age** (dd/mm/yyyy)	**Phone #**	**Date & Type of Contact** (dd/mm/yyyy)	**Prophylaxis Recommended**
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No

BACTERIAL DISEASES SURVEILLANCE FORM – *Neisseria meningitidis*

Please complete this form and fax to the RCDC (Qikiqtaaluk: 975-4833; Kitikmeot: 983-4088; Kivalliq: 645-8272).

1. Name: _____ **2. Sex**: ☐ Male ☐ Female
Last, First, MI

3. Birthdate: _____ **or Age**: _____ years or _____ months
DD/MM/YYYY

4. Ethnicity: ☐ First Nations ☐ Inuit ☐ Metis ☐ Non Aboriginal ☐ Unknown

5. Village: _____ **6. Region:** ☐ Labrador ☐ NWT ☐ Nunavut ☐ Yukon ☐ Quebec (Cree) ☐ Quebec (Nunavik)

7. Reference lab accession #: _____

8. Source of positive isolate(s) from sterile site(s): ☐ Blood ☐ Pleural fluid ☐ Pericardial fluid ☐ Bone ☐ CSF ☐ Peritoneal fluid ☐ Joint ☐ Other _____

9. Date first positive culture obtained (date specimen drawn): _____
DD/MM/YYYY

10. Hospitalized? ☐ Yes ☐ No **If yes, answer questions 11-16. 11. Facility**: _____

12. Admitted: _____ **13. Transferred?** ☐ Yes ☐ No **14. Final discharge**: _____
DD/MM/YYYY DD/MM/YYYY

15. Date Transferred _____ **16. Facility Name(s)** _____

17. Organism: ***Neisseria meningitidis*** **18. Death during this illness?** ☐ Yes ☐ No **19. Date of death**: _____
DD/MM/YYYY

20. Infection(s) caused by organism: *(Check ALL pertinent diagnoses)*

☐ Amnionitis ☐ Empyema ☐ Epiglottitis ☐ Osteomyelitis ☐ Pneumonia
☐ Bacteremia ☐ Endocarditis ☐ Hemolytic uremic syndrome ☐ Pericarditis ☐ Septic abortion
☐ Cellulitis ☐ Endometritis ☐ Meningitis ☐ Peritonitis ☐ Septic arthritis
☐ Other (please specify): _____

21. Other concurrent INFECTIOUS illnesses: ☐ None ☐ No info available Specify other: _____

22. Underlying conditions or illnesses: ☐ None ☐ No info available

☐ Alcohol abuse ☐ Chronic renal failure ☐ Homelessness ☐ Pregnancy/post partum ☐ Trauma
☐ Asthma/RAD ☐ Cirrhosis/liver failure ☐ IVDU ☐ Premature infant
☐ Asplenia ☐ Congestive heart failure ☐ Immunodeficiency disease ☐ Rheumatoid arthritis
☐ Cancer ☐ CSF leak ☐ Immunosuppressive therapy ☐ Smoker (within past year)
☐ Chronic lung disease ☐ Diabetes ☐ Nephrotic syndrome ☐ Stroke/CVA
☐ Other conditions/illnesses (please specify): _____

23. Has patient received *Neisseria meningitidis* vaccine ? ☐ Yes ☐ No ☐ Unk

24. If yes, type and date(s) given: ☐ **Conjugate C** ☐ **Conjugate ACYW-135** ☐ **Polysaccharide**

(1) _____ (2) _____ (3) _____ 4) _____
DD/MM/YYYY DD/MM/YYYY DD/MM/YYYY DD/MM/YYYY

25. Is patient currently attending college (15-24 years old only)? ☐ Yes ☐ No ☐ Unknown

26. Reviewer: _____ 27**. Reviewer phone:** _____ **28. Date complete**: _____

29. Comments:

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Fax completed form to the Regional CDC
Update as necessary:

- Kitikmeot: (867) 983-4088
- Kivalliq: (867) 645-8272
- Qikiqtaaluk: (867) 975-4833

Fill in OR affix CASE addressograph here

Last Name: _____
First Name: _____

Sex: □ Male □ Female

Date of Birth: ___(DD) _____(month) ____(YYYY)

Chart#: _____
Health Card #: _____

Community of Residence: _____

Invasive *Meningococcal (IMD)* Disease CONTACT Investigation Form

Date (dd/mm/yyyy)	Name	DOB or Age (dd/mm/yyyy)	Phone #	Date & Type of Contact (dd/mm/yyyy)	Immunization Status	Prophylaxis Recommended
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No
						☐ Yes ☐ No

BACTERIAL DISEASES SURVEILLANCE FORM – *Streptococcus pneumoniae*

Please complete this form and fax to the RCDC (Qikiqtaaluk: 975-4833; Kitikmeot: 983-4088; Kivalliq: 645-8272).

1. Name: _____ **2. Sex**: ☐ Male ☐ Female
Last, First, MI

3. Birthdate: _____ **or Age**: _____ years or _____ months
DD/MM/YYYY

4. Ethnicity: ☐ First Nations ☐ Inuit ☐ Metis ☐ Non Aboriginal ☐ Unknown

5. Village: _____ **6. Region:** ☐ Labrador ☐ NWT ☐ Nunavut ☐ Yuko ☐ Quebec (Cree) ☐ Quebec (Nunavik)

7. Reference lab accession #: _____

8. Source of positive isolate(s) from sterile site(s): ☐ Blood ☐ Pericardial fluid ☐ Bone ☐ CSF ☐ Peritoneal fluid ☐ Joint ☐ Other _____

9. Date first positive culture obtained (date specimen drawn): _____
DD/MM/YYYY

10. Hospitalized: ☐ Yes ☐ No ***IF YES, ANSWER QUESTIONS 11-16.*** **11. Facility**: _____

12. Admitted: _____ **13. Transferred?** ☐ Yes ☐ No **14. Final discharge**: _____
DD/MM/YYYY DD/MM/YYYY

15. Date Transferred **16. Facility Name(s)**

_____ _____
DD/MM/YYYY

17. Organism: *Streptococcus pneumoniae* **18. Death during this illness?** ☐ Yes ☐ No **19. Date of death**: _____
DD/MM/YYYY

20. Infection(s) caused by organism: *(Check ALL pertinent diagnoses)*

☐ Amnionitis	☐ Empyema	☐ Epiglottitis	☐ Osteomyelitis	☐ Pneumonia
☐ Bacteremia	☐ Endocarditis	☐ Hemolytic uremic syndrome	☐ Pericarditis	☐ Septic abortion
☐ Cellulitis	☐ Endometritis	☐ Meningitis	☐ Peritonitis	☐ Septic arthritis

☐ Other (please specify): _____

21. Other concurrent INFECTIOUS illnesses: ☐ None ☐ No info available Specify other: _____

22. Underlying conditions or illnesses: ☐ None ☐ No information available

☐ Alcohol abuse	☐ Chronic renal failure	☐ Diabetes	☐ Nephrotic syndrome	☐ Stroke/CVA
☐ Asthma/RAD	☐ Cirrhosis/liver failure	☐ Homelessness	☐ Pregnancy/post partum	☐ Trauma
☐ Asplenia	☐ Cochlear implant	☐ IVDU	☐ Premature infant	
☐ Cancer	☐ Congestive heart failure	☐ Immunodeficiency disease	☐ Rheumatoid arthritis	
☐ Chronic lung disease	☐ CSF leak	☐ Immunosuppressive therapy	☐ Smoker (within past year)	

☐ Other conditions/illnesses (please specify): _____

23a. Has patient received 23-valent pneumococcal polysaccharide vaccine? ☐ Yes ☐ No ☐ Unknown

23b. If yes, date(s) given: (1) _____ (2) _____ (3) _____

24a. Has patient received pneumococcal conjugate vaccine (PCV7)? ☐ Yes ☐ No ☐ Unknown

24b. If yes, date(s) given: (1) _____ (2) _____ (3) _____ (4) _____

25a. Has patient received pneumococcal conjugate vaccine (PCV10)? ☐ Yes ☐ No ☐ Unknown

25b. If yes, date(s) given: (1) _____ (2) _____ (3) _____ (4) _____

26a. Has patient received pneumococcal conjugate vaccine (PCV13)? ☐ Yes ☐ No ☐ Unknown

26b. If yes, date(s) given: (1) _____ (2) _____ (3) _____ (4) _____

27. Reviewer: _____ 28**. Reviewer phone:** _____ **29. Date complete**: _____

30. Comments:

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Department of Health
Ministère de la Santé

ᓄᓇᕗᑦ Nunavut

Fill in OR affix addressograph here

Last Name: ______________________

First Name: ______________________

Sex: ☐ Male ☐ Female ☐ Other

Date of Birth: ____(DD) ________(month) _____(YYYY)

Chart#: ______________________

Health Card #: ______________________

Community of Residence: ______________

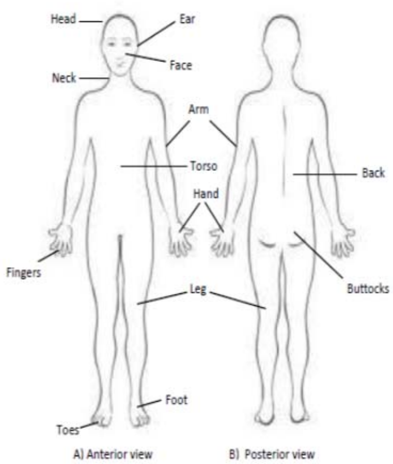
Animal Incident Report Form

CASE #

STEP 1: INCIDENT DETAILS: Report IMMEDIATELY to Environmental Health (contact below)

Date Reported: DD/MM/YYYY______________________ **Date of Incident: DD/MM/YY** ______________________

Details of Incident: ____



Nature of Exposure: ☐ Bite ☐ Scratch ☐ Saliva on intact skin ☐ Handling

☐ Saliva on existing lesion ☐ Saliva on mucous membrane

Description of wounds: ☐ Abrasion ☐ Laceration ☐ Avulsion ☐ Puncture

Skin broken: Yes ☐ No ☐

Nurse/Physician: ______________________ **Phone**: ______________

Patient contact: Phone:______________________

STEP 2: ANIMAL INFORMATION

Owner: ______________________ **Phone** Home ______________ Other______________

If applicable, address: ____

Animal Species: Dog ☐ Cat ☐ Fox ☐ Other ☐ ______________ **Breed or Description**:______________

Bite: provoked ☐ unprovoked ☐ **Animal behavior:** Normal ☐ Abnormal ☐ **Animal:** Stray ☐ Home owned ☐

Current animal location: ______________________________

Animal vaccinated: Yes ☐ No ☐ **By whom:** Vet ☐ Lay Vaccinator ☐ **Proof Provided** Yes ☐ No ☐

AFTER HOURS and Weekends EHO on call contact number is (867) 975-5772

Iqaluit EHO	Pangnirtung EHO	Kivalliq EHO	Kitikmeot EHO
Cape Dorset, Kimmirut, Grise Fiord, Iqaluit, Resolute Bay, Arctic Bay	Clyde River, Hall Beach, Igloolik, Pond Inlet, Pangnirtung, Qikiqtarjuaq	Baker Lake, Chesterfield Inlet, Coral Harbour, Naujaat, Rankin Inlet, Whale Cove, Sanikiluaq	Cambridge Bay, Goa Haven, Kugluktuk, Kugaaruk, Taloyoak
Phone: (867) 975 4817/4815 **Fax: (867) 975-4833**	**Phone (867) 473- 2676** **Fax (867)-473-2657**	**Phone (867) 645- 8071** **Fax (867)-645-8272**	**Phone (867) 983-4236** **Fax (867)-983-4193**