Section 3

Diseases Transmitted by Respiratory Routes

3.1 Introduction

This Respiratory section includes the procedure required in order to complete investigation, control and reporting measures for diseases transmitted via respiratory routes. For each of these diseases, prompt recognition and control measures are vital to containment. The prevention and control measures may vary slightly with each disease, dependant upon several disease-specific factors. The following are general guidelines and further description is provided in each disease section, for those diseases which are preventable by routine vaccination please see that section.

Policy

All laboratory confirmed respiratory illnesses are to be reported to the RMOH or designate, appropriately treated and case follow up completed. Reports from the Provincial Public Health Laboratory are sent to the office of the RMOH, CMOH as well as the attending physician

General Procedure

- Confirm the diagnosis, and confirm whether or not the case has been informed. If confirmation is delayed request immediate notification of test results from the laboratory.
- Obtain required demographic information in relation to the case and the attending physician.
- Contact the case to determine if this individual is in a situation where there is a high risk of transmission of the illness (e.g. childcare, health care worker).
- Investigate the most probable source of infection which should include:
  - Recent exposure to someone else who is sick with similar symptoms
  - Travel history
  - Attendance in childcare, school, daycare, healthcare settings
- Conduct contact tracing to determine if the contact is in a high risk group.
- Conduct contact tracing to inform contacts of any prophylaxis and/or exclusion measures.
- Refer to disease-specific measures and implement necessary activities.
- Educate case and contacts regarding the disease.
- Complete case detail investigation forms on specific diseases.
- Report as per List A, B, C.
- Publicly funded treatment is indicated for meningococcal disease, tuberculosis and *Haemophilus influenzae* type B (Hib) invasive disease. These treatments or prophylaxis are provided through the public health office in the Regional Health Authority

Roles and Responsibilities

Laboratory

Report to CMOH, RMOH and attending physician within four working days for list B, immediately by telephone for list A, aggregate data within one week.

RMOH or designate

- Assign and initiate investigation within four working days
- Ensure confidentiality
- Ensure completion of investigation, follow up and reporting
- If outbreak occurs assign outbreak committee

Investigator

- Ensure case has been informed and treated
- Followed up as necessary with contacts (through the physician or public health)
- Ensure education for prevention has been appropriately disseminated

Guidelines around confidentiality

- Be sensitive to personal circumstances of the situation
- Explain the method of contact notification to case to ensure full cooperation
- Divulge personal information of the case or any contacts only with signed consent form
- Never e-mail names of cases or contacts; fax only if using secure fax line
- Mark all correspondence as personal and confidential

Reports from other Provinces and Territories

Reports of persons tested in other provinces are reportable in the province or territory where tested but if the person has moved back to NL reports are forwarded to the office of the CMOH for follow-up as necessary. When follow up is complete the region must notify the office of CMOH of the outcome of follow-up within two months.

Persons who have moved from Newfoundland and Labrador who may be cases or contacts will also be followed up through contact within provincial/territorial CMOH office through the Newfoundland and Labrador Provincial Medical Officer of Health.

The other diseases transmitted by the respiratory route are found in the following websites

- Invasive Group A Streptococcal Disease – Infection Control Guideline available at http://www.health.gov.nl.ca/health/publichealth/cdc/invasive_groupa_streptococcal_management.pdf

- Invasive Meningococcal Disease (IMD) – Infection Control Guideline available at http://www.health.gov.nl.ca/health/publichealth/cdc/meningococcal_management.pdf

- Invasive Pneumococcal Disease (IPD) – Diseases Preventable by Routine Vaccination available at: http://www.health.gov.nl.ca/health/publications/diseasecontrol/vpd_2010.pdf

- Laboratory Confirmed Influenza – see Diseases Preventable by Routine Vaccination http://www.health.gov.nl.ca/health/publications/diseasecontrol/vpd_2010.pdf

- Tuberculosis – Infection Control Guideline available at http://www.health.gov.nl.ca/health/publichealth/cdc/tuberculosis_management.pdf

3.2 Coxsackievirus Infection (Hand, Foot and Mouth Disease)

Case Definition

Confirmed Case

Clinical illness with laboratory confirmation of infection:

- Detection of Coxsackie group A virus (types 4, 5, 9, and/or 10) or group B virus (types 2 and/or 5) or Enterovirus 71 in stool, rectal swab, throat swab or cerebrospinal fluid by viral isolation
- Detection of virus in appropriate clinical specimen by molecular methods, when available

Probable Case

Clinical illness in a person who is epidemiologically linked to a confirmed case.

Clinical Presentation

The prominent symptoms are diffuse oral lesions on the cheeks, gums, and tongue. This irritation may increase difficulty of swallowing in those affected. Thus, they may eat less. Small red lesions on fingers, palms, and soles are common, persisting for 7-10 days. Lesions may lead to itchiness. These lesions can progress to ulcers, if not treated properly. More rarely, sores may appear on the buttocks. This disease has been occasionally linked to encephalitis and neurological damage, generally due to enterovirus 71 infection. This outcome is still very rare.

Diagnosis

Diagnosis relies heavily on examination by a competent and confident health care provider. It is important for the examiner to be able to differentiate between HFM disease and other typical causes of lesions and sores. Appearance of lesions, patient's age, description of symptoms, and general presentation is beneficial in this process. Rarely is HFM disease lab confirmed.

Epidemiology

Occurrence

Hand, foot, and mouth (HFM) disease occurs worldwide. It usually occurs in summer and early autumn in temperate climates, but can occur throughout the year in tropical climates. Since 1997, outbreaks have been reported in Africa and Australia. HFM became reportable in Newfoundland and Labrador in 2008. Twenty cases of HFM were reported in Newfoundland and Labrador between 2008 and 2010.

While HFM can occur in young adults, it is most commonly observed in children under age 10. Outbreaks are generally observed in schools, daycare centers, and other institutions that children attend.

Reservoir

Humans

Transmission

Direct contact with feces and nose and throat secretions of those infected, as well as direct contact with skin lesions. This virus can also be spread via aerosol droplets.

Incubation Period

It usually lasts between 3-5 days.

Period of Communicability

Risk of communicability typically occurs during the acute stages of coxsackie virus infection, but can also persist for longer periods of time; this is due to the virus' ability to remain in stool several weeks after initial onset.

Control Measures

Management of Case

There is no treatment necessary for this disease. However, treatment of symptoms may be beneficial (i.e. pain relief related to sores, etc.). Pain relief medication, such as acetaminophen, may be used. However, acetylsalicylic acid is not recommended in children under the age of 16. Mouthwashes, oral sprays, and cold beverages may also be used to relieve pain. If severe dehydration develops and the client is unable to take anything by mouth, parenteral fluids may be required.

Management of Contacts

Standard precautions and good, general hygiene measures should be practiced to prevent and limit the spread of coxsackievirus. Caretakers at home as well as in the school and daycare settings need to take precautions to ensure that other children as well as themselves are protected from HFM disease transmission as much as possible; this includes monitoring children's hand-washing technique, properly washing hands before preparation and consumption of food as well as after changing diapers and toileting, carefully disposing used tissue, washing contaminated items in hot water, avoiding kissing, hugging, and/or sharing of utensils, craft supplies, etc.

Management of Outbreaks

An outbreak management team should be established to address infection prevention and control measures.

Education and Preventive Measures

Children infected with coxsackievirus or enterovirus should stay at home until they feel well enough to participate in activities at school or in a daycare setting. This may not completely eliminate person-to-person transmission, but it can greatly reduce the risk. Ventilation and avoidance of large crowds can also reduce transmission.

Routine hygiene practices are crucial in the reduction and elimination of HFM disease. Close contact avoidance, sanitary disposal of contaminated items (e.g. tissues), disinfecting surfaces and inanimate objects with a chlorine bleach solution, and proper handwashing techniques are very important.

A fact sheet is provided at
http://www.health.gov.nl.ca/health/publichealth/cdc/infectioncontrol/hfm_disease_oct2012.pdf

Reporting Requirements and Procedures

- Physicians and laboratories report diseases in List C weekly to the Regional Medical Officer of Health (RMOH)
- The RMOH office reports to Provincial Public Health through an electronic reporting system
- If an outbreak has been identified an outbreak report is completed and sent to Provincial Public Health
- The RMOH office will notify local health professionals and others within the community who require disease information

3.3 *Haemophilus influenzae*, non-b, invasive disease

Case Definition

Confirmed Case

Clinical evidence of invasive disease[1] with laboratory confirmation of infection:

- isolation of *Haemophilus. influenzae (Hi)* (serotypes a, c, d, e, f, undifferentiated and non-typeable isolates) from a normally sterile state

OR

- isolation of *H. influenzae* (serotypes a, c, d, e, f, undifferentiated and non-typable isolates) from the epiglottis in a person with epiglottitis

Clinical Presentation

Invasive non-type b encapsulated strains rarely cause disease. Symptoms are similar to those in type b infections. Invasive nontypable strains frequently cause respiratory tract infections, including conjunctivitis, otitis media, pneumonia, and sinusitis. Less commonly observed symptoms include bacteremia, chorioamnionitis, meningitis, and neonatal septicemia.

Diagnosis

Clinical signs and symptoms must be confirmed by laboratory findings.

Epidemiology

Occurrence

A European study reported in *Emerging Infectious Diseases,* March 2010[2], encompassing 14 countries demonstrated that invasive Hi non-type b encapsulated strains are much less prevalent than invasive Hi type b (Hib; 0.036 cases per 100,000 versus 0.15 cases per 100,000). Invasive nontypable Hi was found to be nearly twice as prevalent as invasive Hib (0.28 cases per 100,000 versus 0.15 cases per 100,000). The introduction of the Hib vaccine has not decreased the prevalence and incidence of invasive Hi non-b infections.

Invasive non-typeable and non-type b strains of Hi were not under national surveillance until 2009. There is no available data on the prevalence and incidence of this disease for the province.

Reservoir

The natural habitat of the organism is in the upper respiratory tract of humans.

Incubation Period

The incubation period is unknown but believed to be short (2–4 days).

[1]Clinical disease associated with invasive disease due to *Haemophilus influenzae* (Hi) includes meningitis, bacteremia, epiglottitis, pneumonia, pericarditis, septic arthritis, and empyema

Period of Communicability

Seven days prior to the onset of symptoms until the case has been on effective antibiotic therapy for 24 hours.

Control Measures

Management of Case

General procedures for managing cases include close monitoring, supportive care, and prompt therapeutic measures. The patient should be on droplet precautions until 24 hours of effective antibiotic therapy has been completed.

Management of Contacts

Provide information to close contacts on the signs and symptoms of infection. Advise to seek medical attention if symptoms occur.

Management of Outbreaks

An outbreak management team should be established to address infection prevention and control measures.

Education and Preventive Measures

This is an ideal time to ensure that vaccination of contacts of Hib cases has been completed. Immunization with Hib is recommended for all children less than 5 years of age. Provide further information available at
http://www.phac-aspc.gc.ca/im/vpd-mev/hib-eng.php

Reporting Requirements and Procedures

- Physicians, laboratories and communicable disease control nurses (CDCNs), and infection control practitioners (ICPs) must immediately report probable or confirmed cases to the Regional Medical Officer of Health (RMOH)
- RMOH office will notify local physicians, nurse practitioners, environmental health officers, community health nurses, CDCNs, and ICPs, in the particular region as required for surveillance
- RMOH reports to provincial office as per list A
- CDCN enters the case into the electronic reporting system and completes an outbreak report form if indicated
- Provincial Disease Control
  - Reports the aggregate case data to Public Health Agency of Canada
  - Provides an analysis of the case/s with reports in the Communicable Disease Report (CDR)

3.4 Hantavirus Pulmonary Syndrome

Case Definition

Confirmed Case

Clinical illness[2] with laboratory confirmation of infection:

- Detection of IgM antibodies to hantavirus

OR

- Detection of a significant (e.g., fourfold or greater) increase in hantavirus-specific IgG antibody titres

OR

- Detection of hantavirus RNA in an appropriate clinical specimen

OR

- Detection of hantavirus antigen by immunohistochemistry

Clinical Presentation

Infection with hantavirus is called Hantavirus Pulmonary Syndrome (HPS). Individuals usually experience fever, chills, occasional headaches, and sometimes gastrointestinal symptoms. Five days after the onset of initial symptoms, cough and shortness of breath typically develop and over the next 24 hours pulmonary edema and deterioration of cardiopulmonary function occur rapidly. Infection without symptoms is very rare. Patients presenting with severe illness due to HPS have a poor prognosis despite ICU care.

Diagnosis

Clinical signs and symptoms must be confirmed by laboratory findings.

Epidemiology

Occurrence

Hantavirus infection was first recognized in North America in 1993. Since then sporadic cases have been identified in the United States and in Canada. Since 1994 when active surveillance for HPS was initiated in Canada, the number of cases per year has fluctuated from a high of eight in 1994 to two cases in 1999. To date about 61 cases

[2] Clinical illness is characterized by:

- a febrile illness {temperature > 38.3°C (101°F) oral} requiring supplemental oxygen

AND

- bilateral diffuse infiltrates (may resemble acute respiratory distress syndrome (ARDS))

AND

- develops within 72 hours of hospitalization in a previously healthy person
  OR
- An unexplained illness resulting in death with an autopsy examination demonstrating non-cardiogenic pulmonary edema without an identifiable specific cause of death

have been reported in Canada with at least 20 deaths. No human cases have been reported in Newfoundland and Labrador (NL).

Reservoir

The primary reservoir is the deer mouse. Antibodies have been found in other rodents such as in chipmunks and pack rats

Transmission

Human infection occurs most commonly through the inhalation of infectious, aerosolized saliva or excreta from rodents. Persons visiting laboratories where infected rodents were housed have been infected after only a few minutes of exposure to animal holding areas.

Transmission can occur when dried materials contaminated by rodent excreta are disturbed and inhaled, directly introduced into broken skin or conjunctivae, or possibly, when ingested in contaminated food or water. Persons have also acquired HPS after being bitten by rodents. High risk of exposure has been associated with entering or cleaning rodent-infested structures.

Incubation Period

The incubation period is thought to be approximately two weeks with a range of a few days to six weeks.

Communicability

There is no evidence of person to person transmission in North America.

Control Measures

Management of Case

There is no specific treatment or cure for hantavirus infection. Treatment of patients with HPS remains supportive. If there is a high degree of suspicion of HPS, patients should be immediately transferred to an emergency department or intensive care unit (ICU) for close monitoring and care.

Management of Contacts

Investigate contacts to determine if they have had the same exposure to HPS as the case. Provide education on the signs and symptoms of HPS and advise exposed contacts to seek medical care if symptoms develop.

Management of Outbreaks

An outbreak management team should be established to address infection prevention and control measures.

Education and Preventive Measures

The best approach for disease prevention and control is through environmental hygiene practices that discourage rodents from colonizing the home and work environment and that minimize aerosolisation and contact with HPS in salvia and excreta. Measures include:

- Preventing rodent exposure
  - Eliminate food sources available to rodents in structures used by humans
  - Limit possible nesting sites for rodents
  - Seal entrances for rodents in the home or cabin

- Safely cleaning up rodent infested areas
  - Ventilate enclosed areas before cleaning for 30 minutes or more
  - Wear an appropriate, well fitting NIOSH approved N 95 respirator, rubber gloves and goggles
  - Disturb the droppings and nesting materials as little as possible. Do *not* sweep before wetting the area and do not use a vacuum cleaner to remove them
  - Thoroughly and carefully wet contaminated areas with detergent to deactivate the virus. Wetting the area will prevent virus particles from being released into the air when material is disturbed during clean-up (do not use a sprayer)
    - Most general purpose disinfectants and household detergents are effective
    - Diluted bleach (one part bleach to 10 parts water) can be used
    - Wipe up droppings, nesting materials and other debris with a paper towel and place in a sealed plastic garbage bag
    - Double bag the contents and dispose as appropriate to local bylaws
    - Clean surfaces that were in contact with mice or their droppings with a solution of water and disinfectant
    - Wash rubber gloves with disinfectant *before removing them*
    - Wash your hands with soap and water after removing gloves
- Providing a fact sheet available at http://www.nr.gov.nl.ca/nr/agrifoods/animal/animal_health/pdf/ds_04_003_hantavirus_in_deer_mice.pdf

Reporting Requirements and Procedures

- Physicians, laboratories and communicable disease control nurses (CDCNs), and infection control practitioners (ICPs) must immediately report suspect or confirmed cases to the Regional Medical Officer of Health (RMOH)
- RMOH office will notify local physicians, nurse practitioners, environmental health officers, community health nurses, CDCNs, and ICPs, in the particular region as required for follow-up and case investigation
- RMOH reports to provincial office as per list B
- CDCN enters the case into the electronic reporting system and completes an outbreak report form if indicated
- Provincial Disease Control
  - Reports the aggregate case data to other health regions
  - Reports the identified case to Public Health Agency of Canada

3.5 Invasive Group A Streptococcal

Infection Control Guideline available at:
http://www.health.gov.nl.ca/health/publichealth/cdc/invasive_groupa_streptococcal_management.pdf

3.6 Invasive Meningococcal Disease

Infection Control Guidelines available at:
http://www.health.gov.nl.ca/health/publichealth/cdc/meningococcal_management.pdf

3.7 Invasive Pneumococcal Disease (IPD)

Diseases Preventable by Routine Vaccination available at:
http://www.health.gov.nl.ca/health/publications/diseasecontrol/vpd_2010.pdf

3.8 Laboratory-Confirmed Influenza

Diseases Preventable by Routine Vaccination available at:

http://www.health.gov.nl.ca/health/publications/diseasecontrol/s4_diseases_preventable_by_routine_vaccination.pdf

3.9 Legionellosis

Case Definition

Confirmed Case

Clinical presentation 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 Presentation

Legionellosis can manifest as one of two illnesses:

- Legionnaires' Disease: nonproductive cough, fever, myalgia, pneumonia; can progress to respiratory failure; 15% case fatality rate
- Pontiac Fever: milder illness without pneumonia; cough may or may not be present; recovery takes place 2-5 days without treatment after presentation of symptoms.

Diagnosis

Different for the two manifestations of disease:

Legionnaires ' disease:

- A significant (e.g. fourfold or greater) rise in *Legionella* species IgG titre between acute and convalescent sera

OR

- Demonstration of *L. pneumophila* antigen in urine

Pontiac Fever:

- Identification of clinical symptoms in appropriate epidemiological setting
- Diagnostic confirmation via urine antigen and serologic testing

Epidemiology

Occurrence

Legionellosis occurs globally, with an increased number of reported cases in the summer and fall. The most common species of bacteria associated with this disease is *L. pneumophila*, but *L. micdadei, L. bozemanii, L. longbeachae,* and *L. dumoffii* have been isolated from immunosuppressed individuals with pneumonia. As well, Legionnaire's Disease and Pontiac Fever have very different attack rates. During an

epidemic, Pontiac Fever has an attack rate of about 95%, whereby Legionnaire's Disease has an attack rate between 0.1- 5%.

The prevalence of Legionnaire's disease in Canada is low, with approximately 75 cases reported annually. Only 2 cases of Legionellosis were reported in Newfoundland and Labrador over the past twenty years. Both were travel-related.

Reservoir

The main source of *Legionella* species is manmade water supplies. They can include air conditioning cooling towers, humidifiers, respiratory therapy equipment, and potable water systems (e.g. showers).

The prevalence of Legionnaire's disease in Canada is low, with approximately 75 cases reported annually. Only 2 cases of Legionellosis were reported in Newfoundland and Labrador over the past twenty years. Both were travel-related.

Transmission

Airborne, possibly water aspiration

Incubation Period

Legionnaire's disease 2-10 days, usually 5-6 days; Pontiac fever 5-72 hours, most often 24-48 hours.

Period of Communicability

Person-to-person transmission has not been detected.

Control Measures

Management of Cases

Treatment of Legionnaire's disease requires either newer macrolides (azithromycin) or respiratory fluoroquinolones (levofloxacin). Severe cases of Legionnaire's disease may be more effectively mediated by levofloxacin rather than macrolides. Pontiac fever does not require any treatment.

Management of Contacts

Contact investigation should be initiated and a search for the source of the infection should be undertaken.

Management of Outbreaks

There are several important steps that should be incorporated in the management of *Legionella* outbreaks.

- Determine common exposures of water sources among the cases
- Review maintenance logs for water systems that are potential sources of infection
- Culture can help verify the outbreak's cause
- Thermal eradication and chemical treatment of water supplies may help prevent outbreaks, under appropriate conditions
- Once contained, develop regular cleaning and disinfecting schedule

Education and Preventive Measures

Growth of *Legionella* is most likely to occur in water that is stagnant, warm (25-42 degrees Celsius), contains sediment and scale, and has low biocide levels. Thus, it is important to take precautions to prevent bacterial growth. Manmade water sources need to be maintained and disinfected on a regular basis. Hot water systems should be maintained at temperatures higher than 50 degrees Celsius. Cooling towers need to be cleaned regularly to prevent buildup of sediment and scale, and should be drained when not being used. Appropriate biocides can help prevent growth of *Legionella.* It is not advisable to use tap water in respiratory devices. Instead, sterile water should be used.

For more information on *Legionella pneumophila*, a material safety data sheet is provided at http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/legionella-eng.php
A fact sheet is provided at
http://www.phac-aspc.gc.ca/id-mi/legionella-eng.php

Reporting Requirements and Procedures

- Physicians, laboratories and communicable disease control nurses (CDCNs), and infection control practitioners (ICPs) must immediately report suspect or confirmed cases to the Regional Medical Officer of Health (RMOH)
- RMOH office will notify local physicians, nurse practitioners, environmental health officers, community health nurses, CDCNs, and ICPs, in the particular region as required for follow-up and case investigation
- RMOH reports to provincial office as per list A
- CDCN enters the case into the electronic reporting system and completes an outbreak report form if indicated
- Provincial Disease Control
  - Reports the aggregate case data to other health regions
  - Reports the identified case to Public Health Agency of Canada

3.10 Leprosy

To be developed

3.11 *Mycoplasma pneumoniae* infection

Case Definition

Confirmed Case

Clinical illness with laboratory confirmation of infection:

- Rise in antibody titres against *Mycoplasma pneumoniae* between acute and convalescent sera collected 3-6 weeks apart

OR

- Bacterial culture from sputum or throat swabs

OR

- Detection of bacterial DNA via PCR using throat swabs/sputum

Probable Case

Clinical illness in a person who is epidemiologically linked to a confirmed case

Clinical Presentation

Symptoms associated with this infection are generally mild. “Atypical pneumonia” usually results from infection of this bacteria, as well as *Chlamydia* and *Legionella* bacteria, *Coxiella burnetii*, and influenza and adenoviruses. It is given this name due to the milder symptoms of this pneumonia compared to pneumonia caused by *Streptococcus pneumoniae* and *Haemophilus influenzae*, for example. However, symptoms may be more serious in middle-aged and older individuals, and those with sickle cell disease. It is a common cause of pneumonia in children who are school-aged and young adults.

Common, mild symptoms include coughing, fever, headache, malaise, and sore throat. Less common symptoms include ear pain, rapid breathing, rashes, and painful muscles. Leukocytosis occurs in one-third of those infected one week after onset. If not treated, the infection may progress to tracheobronchitis. Albeit rare, cardiologic, neurologic, and dermatologic syndromes may develop from infection.

Diagnosis

Presentation of clinical symptoms along with confirmation from a chest x-ray, bronchoscopy, or CT Scan of the chest can warrant diagnosis of atypical pneumonia. An increase in antibody titres, a positive bacterial culture, or presence of bacterial DNA can confirm diagnosis.

Epidemiology

Occurrence

This infection occurs worldwide. Outbreaks generally occur in schools, daycares, and households, and military populations in late summer and autumn. The attack rate of mycoplasma pneumonia in military populations is 5 – 50 cases/1000/year, while it is 1-3 cases/1000/year in the general population. It is estimated that there are around 2 million cases of *Mycoplasma pneumoniae* infection each year in U.S. This bacterial infection is not reportable in Canada.

Between 2006 and 2010 in this province, there was an average of approximately 82 cases of mycoplasma pneumonia per year. 31 cases were reported in 2010. However, much variation in cases per year has been noted, with 14 reported in 1993 and 169 in 2005.

Reservoir

Mycoplasma pneumoniae causes disease only in humans.

Transmission

Person-to-person transmission occurs via droplet inhalation as well as direct contact with a case. Secondary cases among contacts are frequent.

Incubation Period

The incubation period is between 6 and 32 days.

Period of Communicability

It does not usually last more than 20 days. However, the bacteria may remain in the respiratory tract for weeks despite the subsiding of symptoms.

Control Measures

Management of Cases

Treatment can incorporate azolides, erythromycin, or tetracyclines, but the latter cannot be used in children under the age of 8. Drug therapy can help alleviate symptoms more quickly than if they were not used. Fever and other symptoms can be treated as required. It is important to ingest plenty of fluids and to get a great deal of rest.

Management of Contacts

Household contacts who have symptoms of cough and fever should be monitored for development of pneumonia.

Management of Outbreaks

An outbreak management team should be established to address infection prevention and control measures.

Education and Preventive Measures

- Proper measures should be undertaken, including disinfecting surfaces, thorough handwashing, and cough etiquette
- Avoiding conditions that are crowded, when possible
- Additional information available at http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/myco-pneu-eng.php

  Provide fact sheet at http://www.lung.ca/diseases-maladies/a-z/pneumonia-pneumonie/mycoplasma-mycoplasme_e.php

Reporting Requirements and Procedures

- Physicians and laboratories report diseases in List C weekly to the Regional Medical Officer of Health (RMOH)
- The RMOH office reports to Provincial Public Health through an electronic reporting system
- If an outbreak has been identified an outbreak report is completed and sent to Provincial Public Health
- The RMOH office will notify local health professionals and others within the community who require disease information
- Provincial Disease Control
  - Reports the aggregate data to other health regions

3.12 Parovirus B19 Infection

Case Definition

Confirmed Case

Clinical illness with laboratory confirmation of infection:

- Detection of IgM antibodies against parvovirus B19, or a rise in B19 IgG antibodies
- Detection of B19 DNA or detection of viral antigens of B19 DNA

Probable Case

Clinical illness in a person who is epidemiologically linked to a confirmed case

Clinical Presentation

One quarter of all individuals with parvovirus B19 will not experience any symptoms. The most common characteristic of parvovirus B19 infection is intensely red cheeks, which has led to another name of this disease – "slapped face disease". The "lacelike" pattern rash generally presents on one's trunk and spreads to arms, buttocks, and thighs. Fever, malaise, and headache often precedes appearance of the rash. In adults, a rash is unlikely. However, symptoms such as arthritis or arthralgia may be manifested.

Although symptoms from parvovirus B19 infection are mild in most individuals, it can be fatal for individuals with chronic hemolytic anemia's and immunosuppression. Parvovirus B19 infection during the first half of pregnancy can cause complications for the fetus. Those with anemia may develop aplastic crisis.

Diagnosis

Presence of red rash as described above and flu-like symptoms are indicative of Parvovirus B19 infection. Detection of antibodies against parvovirus B19, antigens of B19, or B19 DNA confirms the diagnosis.

Epidemiology

Occurrence

Parvovirus B19 infection occurs mainly in children and it affects individuals worldwide. Epidemics of parvovirus B19 infection generally occur in winter and spring in temperate zones, but it can occur sporadically. Between 2006 and 2010 in Newfoundland and Labrador, there was an average of 33.4 cases per year.

Reservoir

Humans

Transmission

Parvovirus B19 is mainly transmitted person-to-person through respiratory secretions, such as coughing and sneezing. Maternal-fetal transmission can also occur.

Incubation Period

The incubation period is usually 4-14 days, but can be 21 days.

Period of Communicability

This generally occurs before the onset of a rash. Once the rash appears, the individual is no longer contagious. Individuals with aplastic crisis are contagious until one week after symptoms initially appear. Immunosuppressed individuals with chronic infection and severe anemia can remain infectious for a period of several months to years.

Control Measures

Management of Cases

There is no general treatment for Parvovirus B19 infection. Oral fluids and medication(s) for pain relief may help alleviate some symptoms. Hospitalization may be required to treat individuals with chronic hemolytic anemia.

Management of Contacts

Pregnant women who may be exposed to parvovirus B19 should be aware of their levels of B19 IgG and IgM antibodies, and should be offered counseling to understand fetal risks.

It is important to note that because parvovirus B19 is contagious before the appearance of symptoms, individuals with parvovirus B19 infection should not be excluded from work and school settings. Pregnant women should be informed about the risks of attending public activities during an outbreak.

Management of Outbreaks

An outbreak management team should be established to address infection prevention and control measures.

Education and Preventive Measures

Many individuals who become infected with parvovirus B19 do not experience severe symptoms. Prevention is targeted towards individuals most at risk of developing severe complications. Individuals with chronic hemolytic anemia, those who are immunocompromised, and pregnant women need to understand the risk of being infected with parvovirus B19 while in an environment at risk for transmission of the disease. Effective, routine hygienic measures can help reduce the spread of parvovirus B19.

A fact sheet on parvovirus B19 is provided at
http://www.cdc.gov/parvovirusB19/fifth-disease.html

Reporting Requirements and Procedures

- Physicians and laboratories report diseases in List C weekly to the Regional Medical Officer of Health (RMOH)
- The RMOH office reports to Provincial Public Health through an electronic reporting system
- If an outbreak has been identified an outbreak report is completed and sent to Provincial Public Health
- The RMOH office will notify local health professionals and others within the community who require disease information
- Provincial Disease Control
  - Reports the aggregate data to other health regions

3.13 Respiratory Syncytial Virus

Case Definition

Confirmed Case

Clinical illness with laboratory confirmation of infection:

- Isolation of RSV from respiratory secretions in cell cultures

OR

- Identification of viral antigen in nasopharyngeal cells by FA, ELISA, or RIA

OR

- Fourfold or greater rise in RSV antibody titre between acute and convalescent sera

Probable Case

Clinical illness in a person who is epidemiologically linked to a confirmed case

Clinical Presentation

RSV infections often begin with upper respiratory tract disease, which progresses to lower respiratory tract disease in some cases. It can cause acute respiratory illness in people of any age. RSV is also the most common cause of bronchiolitis and pneumonia in young children. Other symptoms include coughing, fatigue, fever, headache, and runny nose. Very young infants with RSV may present with few symptoms, including poor appetite, apnea, and irritability.

Diagnosis

Antigen detection tests can be used to diagnose RSV. Cell cultures can **supplement** the diagnosis. Antigen detection tests are 80-90% sensitive, but may only be highly sensitive in detecting RSV in young children. As well, serologic tests are not generally used in diagnosis due to their lack of timeliness. RT-PCRs are now commercially available for diagnosis. RT-PCRs' sensitivity is greater than that of antigen detection tests, and can be used to diagnose RSV in all age groups.

Epidemiology

Occurrence

RSV infects almost all children before the age of three. RSV is seasonal, generally resulting in epidemics throughout winter and spring in Canada, particularly February and March. The appearance of RSV in Newfoundland and Labrador also follows seasonality, with cases appearing every year between January and May. The majority of them appear in March. It is quite common – there are between 90,000 and 100,000 hospitalizations and 4500 deaths per year in the United States due to RSV infections.

Reservoir

Humans are the only source of infection.

Transmission

Droplet and aerosol transmission via direct contact with contaminated secretions of the infected person or by contact with contaminated environmental surfaces.

Incubation Period

2-8 days; 4-6 days is the more common incubation period.

Period of Communicability

The period of viral shedding is usually 3-8 days. Immunosuppressed individuals may be able to spread the virus for three to four weeks after recovery.

Control Measures

Management of Cases

The primary therapy for RSV is supportive and should include hydration and careful assessment of respiratory state. Most previously healthy children do not require hospitalization. Those who require hospitalization are usually discharged in 3.5 days. Infants may need intravenous fluid to ensure hydration, as well as supplemental oxygen to reverse hypoxemia. Antibiotics are not required unless there is a secondary bacterial infection.

Management of Contacts

Spread among households and childcare contacts are common. Caretakers at home as well as in the school and daycare settings need to take precautions to ensure that other children are protected from RSV transmission as much as possible. Preventative measures include attention to hand and environmental hygiene, avoidance of kissing and hugging, and the sharing of utensils.

Management of Outbreaks

An outbreak management team should be established to address infection prevention and control measures.

Education and Preventive Measures

Education is the primary means of preventing acquisition and spread of RSV. Parents need to practice and teach their children hygiene tools, such as proper hand hygiene techniques, the importance of covering the mouth and nose when coughing and/or sneezing, sanitary disposal of mouth and nasal discharges, not sharing items that could contain mouth and/or nose discharge, and avoiding people who may be infected.

Palivizumab, a monoclonal antibody, is used in certain high risk infants to prevent RSV. It is delivered once/month intramuscularly that can reduce the risk of hospitalization among high-risk children by 45% - 55%.

A fact sheet is provided at
http://www.health.gov.nl.ca/health/publichealth/cdc/infectioncontrol/rsv_dec2012.pdf

Reporting Requirements and Procedures

- Physicians and laboratories report diseases in List C weekly to the Regional Medical Officer of Health (RMOH)
- The RMOH office reports to Provincial Public Health through an electronic reporting system
- If an outbreak has been identified an outbreak report is completed and sent to Provincial Public Health
- The RMOH office will notify local health professionals and others within the community who require disease information
- Provincial Disease Control
  - Reports aggregate data to other health regions

3.14 Severe Respiratory Illness, unknown origin

Severe Respiratory Illness (SRI) encompasses diseases of unknown origin believed to be caused by infective respiratory pathogens. It is imperative to carry out standard surveillance and prudent diagnostic measures to determine what is causing the SRI.

The standard format for each disease in this manual will not be followed for this particular section.

SRI Case

To be confirmed as an SRI case, criteria must be met in four categories for being either (A) hospitalized or (B) deceased. The categories are:

1) Respiratory symptoms
2) Evidence of severe disease progression
3) No alternate diagnosis within the first 72 hours of hospitalization
4) Epidemiological exposure

For more information, please read the section *SRI Alert* beginning on page 3 of http://www.phac-aspc.gc.ca/eri-ire/pdf/02-SRI-Surveillance-Protocol_e.pdf

Diagnosis

Along with clinical symptoms, there are several methods of laboratory analysis that can be undertaken to confirm diagnosis, and to identify the organism causing the illness:

- Blood culture
- Sputum for culture and sensitivity
- Nasopharyngeal swab in viral transport for:
  - Virus culture (influenza, parainfluenza, RSV, adenovirus)
  - Direct antigen testing
- Nasopharyngeal swab in transport medium for:
  - *Chlamydia pneumoniae* PCR or culture
  - *Mycoplasma pneumoniae* PCR or culture
- Serology for *Mycoplasma pneumoniae*

Other diagnoses may include:

- Tuberculosis: sputum, lower respiratory tract specimen if available
- Legionella: urine, sputum, lower respiratory tract specimen if available, acute and convalescent serum

For more information on diagnosing SRI, please visit http://www.phac-aspc.gc.ca/eri-ire/pdf/07-Novel-Influenza-Laboratory-Guidelines_e.pdf

Reporting Requirements and Procedures

- Physicians, laboratories and communicable disease control nurses (CDCNs), and infection control practitioners (ICPs) must immediately report suspect or confirmed cases to the Regional Medical Officer of Health (RMOH)

- RMOH office will notify local physicians, nurse practitioners, environmental health officers, community health nurses, CDCNs, and ICPs, in the particular region as required for follow-up and case investigation
- RMOH reports to provincial office as per list A
- CDCN enters the case into the electronic reporting system and completes an outbreak report form if indicated
- Provincial Disease Control
    - Reports the aggregate case data to Public Health Agency of Canada

Links

The page “Emerging Respiratory Infections” from Public Health Agency of Canada provides a great deal of information on surveillance of SRIs, management of SRIs, and laboratory testing.

http://www.phac-aspc.gc.ca/eri-ire/index-eng.php

3.15 Tuberculosis

Infection control guideline available at

http://www.health.gov.nl.ca/health/publichealth/cdc/tuberculosis_management.pdf