



# Haemophilus Influenza Type b, Invasive (Hib)

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## 1. CASE DEFINITION

### Confirmed Case

- Clinical illness\* of invasive disease with laboratory confirmation of infection\*\* with:
  - Isolation of *H. influenzae* (serotype b) (Hib) from a normally sterile site **OR**
  - Isolation of *H. influenzae* (serotype b) from the epiglottis in a person with epiglottitis

### Probable case

- Clinical illness\* with laboratory evidence of infection \*\* with:
  - Demonstration of *H. influenzae* type b 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

\* Clinical illness associated with invasive disease due to *H. influenzae* includes meningitis, bacteremia, epiglottitis, pneumonia, pericarditis, septic arthritis and empyema.

\*\* Detection of *H. influenzae* DNA is considered probable, not confirmed, because *H. influenzae* may be present in a non-pathogenic role and thus, depending on the site, may NOT reflect the actual pathogen. Additionally, detection of *H. influenzae* DNA in a sterile site does NOT indicate that it is type b, since this test does not differentiate between serotypes. Specimen must be serotyped to confirm infection with *H. influenzae* (serotype b).

## 2. DIAGNOSIS

- Diagnosis is made by isolation of organisms from a normally sterile site such as cerebrospinal fluid, blood, joint or pleural fluid
- The organism must be typed to identify if it is serotype b
- For more information, refer to [Alberta Provincial Laboratory Guide to Services](#)

## 3. REPORTING

As described in the [NWT Public Health Act 2009](#), health care professionals and laboratories shall provide the Chief Public Health Officer or designate with the information required by the regulations, within the time set out in the regulations.

### Health Care Professionals

- Confirmed or probable cases are to be reported to the Office of the Chief Public Health Officer (OCPHO) by telephone or fax within **24 hours** of diagnosis being made or opinion is formed, **AND**
- Complete and fax the [Communicable Disease Form](#) to the OCPHO within **24 hours**
- Immediately report all outbreaks or suspect outbreaks by telephone to the OCPHO

## Laboratories

- Report positive results to the OCPHO by fax within **24 hours**

## 4. OVERVIEW

For more information about *haemophilus influenzae* type b:

- Government of Canada: [Haemophilus influenzae disease - Canada.ca](http://Haemophilus influenzae disease - Canada.ca)
- Centres for Disease Control and Prevention: [Haemophilus influenzae | Hib | About the Disease | CDC](http://Haemophilus influenzae | Hib | About the Disease | CDC)
- World Health Organization: [WHO | Haemophilus influenzae type B](http://WHO | Haemophilus influenzae type B)

### Causative Agent

- *H. influenzae* is a gram-negative coccobacillus bacteria
- *H. influenzae* is divided into unencapsulated (non-typable) and encapsulated strains
- The encapsulated strains are further classified into serotypes **a** through **f** based on the antigenic characteristics of their polysaccharide capsules
- Type b (Hib) is the most pathogenic and the one that is reportable in the NWT

### Clinical Presentation

- Hib starts by colonizing the nasopharynx and may remain either transiently or for several months in the absence of symptoms
- In some persons, the organism enters the bloodstream and spreads to a normally sterile site causing an invasive infection
- Most common types of invasive disease include: meningitis, epiglottitis, pneumonia, arthritis, cellulitis, osteomyelitis and bacteremia
- Most cases now occur in infants and children 5 years of age and under who are unvaccinated or incompletely vaccinated
- Approximately, 55-65% of affected children develop meningitis

- Symptoms of meningitis include fever, vomiting, lethargy, changes in mental status or behaviour, severe headache, poor feeding and a bulging fontanel in infants or a stiff neck/back in children
- It usually progresses to stupor or coma
- Clinical signs of meningococcal, pneumococcal and Hib meningitis are indistinguishable

### Major Complications

- 3-6% of cases are fatal and up to 25% of survivors have permanent hearing loss or brain damage

### Transmission

- Humans are the only known reservoir
- Hib enters the body through the nasopharynx
- Hib does not survive in the environment on inanimate surfaces
- Invasive Hib often follows an upper respiratory infection
- Anyone can carry the Hib bacteria in the back of their nose and throat without causing severe disease but still pass it on to someone else
- Transmission is person-to-person by direct contact of secretion or through inhalation of droplets of respiratory tract secretions containing the organism
- In neonates, the source of infection may be the aspiration of amniotic fluid or genital tract secretions containing the organism
- The disease can be transmitted for as long as the organisms are present, which can be prolonged even without nasal discharge
- Transmission stops within 24-48 hours of starting effective antimicrobial therapy
- The risk of Hib meningitis is at least twice as high for children attending full-time day care as for children cared for at home
- Other factors that predispose one to invasive disease include sickle cell disease, asplenia, HIV infection, certain immunodeficiency syndromes, and malignant neoplasm

## Incubation Period

- Unknown, but probably short (2 to 4 days)

## Clinical Guidance

- For patient-specific clinical management consult your local health care professional, paediatrician or infectious disease specialist

## 5. PUBLIC HEALTH MEASURES

- Verify serotype with the lab – once growth on the culture media has occurred, serotyping for type b will take approximately 24 hours
- Follow-up and prophylaxis is usually only done if the responsible organism is *H. influenzae* type b and the disease is invasive
- Consult the OCPHO for prophylaxis recommendations

## Management of Cases

- Determine immunization status of the case to assist with determining the likelihood of Hib infection
- If the case has completed a full series of vaccine, it is less likely to be Hib
- In hospital, patients should be placed on droplet and contact precautions
- Immediately notify the facility's infection prevention & control practitioner
- Follow the (hyperlinked document) NWT Infection Prevention and Control Manual [Policies and Guidelines, Standards and Manuals | HSS Professionals](#)
- Maintain infection, prevention and control precautions until the completion of 24 hours of appropriate antibiotic therapy

## Management of Contacts

- Identify contacts and obtain the ages, immunization status, weights and dates of contact
- Contacts include:
  - All persons living in the household
  - Any individual who has had 4 or more hours of contact with the case, regardless

of the age of the case, and one of the following lives in the same household as the contact:

- » At least 1 unvaccinated or partially vaccinated child younger than 48 months and/or
  - » An immunocompromised child of any age regardless of the child's immunization status
  - » All daycare/childcare/nursery school contacts, including staff
  - » Health care workers who perform mouth-to-mouth resuscitation to the case
- Prophylaxis with Rifampin is recommended for the above contacts and as per the Chief Public Health Officer or designate:
    - Prophylaxis should be offered to persons who had contact with the case in the 7 days preceding the onset of illness and for up to 10 days after the last contact with an untreated case
    - Follow [Bugs & Drugs: Home](#) website for recommended doses
    - If the decision is made to provide prophylaxis to contacts in the household, childcare setting or nursery then prophylaxis must be offered to all persons in that setting regardless of age or immunization status and started on the same day if possible
  - Children in the household or childcare setting who are unimmunized or incompletely immunized for age should be offered immunization with a Hib containing vaccine and their vaccination schedule completed as per the [NWT Immunization Schedule](#)
  - Based on the high efficacy of Hib vaccination, prophylaxis is not indicated when all household contacts younger than 48 months have completed their immunization series
  - Educate parents and guardians regarding the signs and symptoms of Hib, and encourage careful observation of exposed household and childcare center contacts for 10 days post contact regardless of prophylaxis received

- Exposed individuals who develop a febrile illness should receive prompt medical evaluation

## Prevention

- Hib is a vaccine preventable disease
- Vaccine for Hib is publicly funded in the NWT and offered according to the [NWT Immunization Schedule](#)
- For more information on Hib vaccination follow [Page 5: Canadian Immunization Guide: Part 4 - Active Vaccines - Canada.ca](#)

## 6. PUBLIC & HEALTH PROFESSIONAL EDUCATION

- Government of Canada website for [Haemophilus influenzae disease](#)

## 7. EPIDEMIOLOGY

- For more information on the epidemiology of *haemophilus influenzae* type b in the NWT see: <http://professionals.hss.gov.nt.ca/sites/default/files/epidemiological-summary-haemophilis-type-b-invasive.pdf>

## 8. REFERENCES

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