



## Public Health Investigation Quicksheet: Invasive *Haemophilus influenzae*



### **Infectious Agent**

*Haemophilus influenzae* (*H.flu*), a bacterium, can be isolated in six encapsulated forms (types a-f) and also in unencapsulated forms. The polysaccharide capsule is an important virulence factor; unencapsulated or "nontypable" strains typically do not cause invasive disease. Pharyngeal colonization with *H.flu* is relatively common, especially with unencapsulated strains and non-b capsular strains.

Young children do not have the ability to make antibodies to polysaccharide and are more susceptible to infection with encapsulated bacteria. This is especially true for children between six months and one year of age who no longer have maternal antibody protection. People with functional or anatomic asplenia and other conditions are also at higher risk of infection with encapsulated bacteria.

### **Mode of Transmission**

Person-to-person by inhalation of respiratory aerosols or by direct contact with respiratory tract secretions.

### **Communicability**

The contagious potential is considered to be limited. However, close contact with a case (e.g., in a household, daycare, or institutional setting) can lead to an outbreak or secondary transmission of the disease. Data on secondary transmission are based on cases of *H.flu* type b; there is limited data on transmission dynamics of type a disease.

### **Incubation Period**

The incubation period is unknown.

### **Case Investigation**

*Start the case investigation as soon as possible regardless of whether serotype is not yet known. This allows more time for planning broader prophylaxis and interventions while laboratory testing is being completed should the serotype come back as H.flu, type b "Hib" or type a "Hia".*

1. Review clinical records (admission history & physical, progress notes) to confirm that the suspected case meets the [NNDSS case definition](#) clinical criteria for *H.flu* invasive disease.
2. Confirm that laboratory tests performed meet the criteria for diagnosis confirmation.
  - a. Detection/Isolation of *H.flu* from a normally sterile body site (e.g., CSF, blood, joint fluid, pleural fluid, pericardial fluid).
  - b. Ensure that isolate or nucleic acid sample is forwarded to the Arctic Investigations Program for confirmation and serotype testing.
3. Ensure that patient is receiving appropriate antibiotic treatment.
  - a. Exclude from day care, school, or work for at least 24 hours after appropriate antibiotic therapy has been given.
4. Complete the [H.flu Invasive Disease Case Questionnaire](#) to identify household contacts and/or other individuals at high-risk for serious disease.
  - a. Ensure that appropriate chemoprophylaxis is initiated as soon as possible for cases of invasive disease caused by Hib. Because some secondary cases may occur late, initiation of prophylaxis  $\geq 7$  days after hospitalization of the index patient may still be of some benefit. See the following Guidelines for Chemoprophylaxis section.
5. Perform active surveillance to monitor exposed unimmunized or incompletely immunized contacts for evidence of disease.

Individuals who develop febrile illness should receive prompt medical evaluation.

6. Fax the completed Case Questionnaire to AK-SOE at 907-563-7868.

### **Patient Treatment**

Initial therapy for children with *H.flu* meningitis is cefotaxime or ceftriaxone. Ampicillin can be substituted if the Hib isolate is susceptible to ampicillin. Treatment of other invasive *H.flu* infections is similar. Therapy is continued for 7-10 days by the intravenous route and longer in complicated infections.

Treatment of Hib disease with cefotaxime or ceftriaxone eradicates Hib colonization, eliminating the need for prophylaxis of the index patient. Patients who do not receive at least 1 dose of cefotaxime or ceftriaxone and who are younger than 2 years should receive rifampin prophylaxis at the end of therapy for invasive infection.

### **Isolation of Hospitalized Patients with Invasive Hia or Hib Disease**

Droplet precautions are recommended for 24 hours after the initiation of appropriate parenteral antimicrobial therapy.

### **Guidelines for Chemoprophylaxis for Contacts of Index Case**

Chemoprophylaxis is recommended around cases of invasive Hib disease, see indications and guidelines in section below.

Clinicians may consider prophylaxis of contacts of index cases of invasive Hia disease using the same criteria as that recommended for Hib disease. Chemoprophylaxis is not recommended for contacts of people with invasive disease caused by non-type b, non-type a, or nontypable *H.flu* strains, because secondary disease is rare. Chemoprophylaxis is recommended for the index case to prevent a reoccurrence of invasive disease in the situations described below.

### **Chemoprophylaxis**

#### **For Hia, Chemoprophylaxis may be considered**

- For all household contacts<sup>a</sup> when at least one member of the household is aged <4 years or if an immunocompromised child is present regardless of their age.
- For preschool and child care center contacts when 2 or more cases of Hia invasive disease have occurred within 60 days
- For the index patient, if aged <2 years or in a household with a susceptible contact and treated with a regimen other than cefotaxime or ceftriaxone at the end of therapy for invasive infection.

#### **Hia Chemoprophylaxis Not Recommended**

- For pregnant women
- For preschool and childcare contacts of index patient
- For occupants of households with no children younger than 4 years other than the index patient and all household contacts are immunocompetent
- For health care personnel

#### **For Hib, Chemoprophylaxis Recommended**

- For all household contacts<sup>a</sup> in the following circumstances:
  - Household with at least 1 contact younger than 4 years of age, other than index case, who is unimmunized or incompletely immunized<sup>b</sup>
  - Household with a child younger than 12 months of age who has not completed the primary 3-dose Hib series
  - Household with a contact who is an immunocompromised child, regardless of that child's Hib immunization status or age
- For preschool and childcare center contacts when 2 or more cases of Hib invasive disease have occurred within 60 days (see text)

- For the index patient when he/she is treated with a regimen other than cefotaxime or ceftriaxone if younger than 2 years OR if there is a household member who is a susceptible contact.

**Hib Chemoprophylaxis Not Recommended**

- For pregnant women
- For occupants of households with no children younger than 4 years other than the index patient
- For occupants of households when all household contacts are immunocompetent, all household contacts 12 through 48 months of age have completed their Hib immunization series (for Hib only), and when household contacts younger than 12 months have completed their primary Hib immunizations
- For preschool and child care contacts of 1 index case
- For healthcare personnel

For prophylaxis, rifampin should be given orally:

Persons > 1 month of age	Once a day for 4 days (20 mg/kg; maximum dose 600mg)
Infants younger than 1 month of age	Once a day for 4 days (10 mg/kg)

<sup>a</sup> Defined as people who spent 4 or more hours with the index patient for at least 5 of the 7 days preceding the day of hospital admission of the index case.

<sup>b</sup> Complete immunization is defined as having completed the PedvaxHib 3-dose series at 2, 4, and 12–15 months. Refer to CDC immunization schedules for catch-up schedules and other Hib products.

**Reporting**

Enter case investigation information into the AK-STARS surveillance database. Refer to disease-specific data entry guidelines. Complete FTR report when warranted by circumstances.

**Resources**

Case Investigation and Classification Flowchart (Appendix A)

[AK-SOE H. influenzae webpage](#)

2018-2021 AAP Red Book

# Invasive *Haemophilus influenzae* Case Investigation and Classification Flowchart

