



Haemophilus influenzae Quicksheet



Infectious agent

Haemophilus influenzae a bacterium, can be isolated in encapsulated and unencapsulated forms. There are six capsular forms (types a-f). The polysaccharide capsule is an important virulence factor. Unencapsulated strains are generally referred to as nontypeable.

Epidemiology

Virtually all invasive disease in the prevaccine era (<1988) was due to capsular type b (Hib) and Hib was the most common cause of bacterial meningitis. Invasive Hib disease in the U.S. today occurs primarily in underimmunized children and among infants too young to have completed the primary vaccination series.

Clinical symptoms

- Invasive Hib disease can produce a number of clinical syndromes including pneumonia, bacteremia, meningitis, epiglottitis, septic arthritis and cellulitis. Other encapsulated strains may also occasionally cause invasive disease.
- Untypeable strains generally cause noninvasive respiratory tract infections such as conjunctivitis and otitis, but can occasionally cause invasive disease.

Mode of transmission

H. influenzae is transmitted person-to-person by inhalation of respiratory droplets or by direct contact with respiratory tract secretions. Neonates can become infected by aspiration of amniotic fluid or by contact with genital tract secretions containing the organism.

Incubation period

The incubation period is unknown.

Period of communicability

Likely to be as long as *H. influenzae* is present in the upper respiratory tract, which may be a prolonged period.

Communicability

The contagious potential of invasive *H. influenzae* disease is considered to be limited. However, certain circumstances, particularly close contact with a case (e.g., in a household, daycare center, or institutional setting), can lead to outbreaks of Hib or secondary transmission of the disease. Asymptomatic nasopharyngeal colonization with nontypeable strains occurs in 40-80% of children. Colonization with encapsulated strains is uncommon.

Laboratory testing

Cerebrospinal fluid (CSF), blood, synovial fluid, pleural fluid, and middle ear aspirates should be cultured on a medium such as chocolate agar. Gram stain can facilitate presumptive diagnosis.

All *H. influenzae* isolates associated with invasive disease in children <5 years of age (and if possible isolates from children 5-14 years of age) should be serotyped in order to identify the strain and to monitor epidemiologic trends and to differentiate between serotype b and other serotypes for which control measures are not required.

Latex agglutination is a rapid, sensitive and specific method for direct detection of Hib capsular polysaccharide in CSF, but a negative test does not exclude the diagnosis and false positive tests have been reported. Antigen testing of urine or serum is unreliable and is not recommended.

The CDPH Microbial Diseases Laboratory (MDL) can perform *H. influenzae* serotyping on isolates from sterile sites if the local health department or hospital laboratory cannot perform such typing. Please contact the MDL Special Pathogens Unit at (510) 412-3903 before sending isolates or for further information regarding laboratory testing for *H. influenzae*.

CDC case definition and classification

Clinical case definition: Invasive disease caused by *H. influenzae* may produce any of several clinical syndromes, including meningitis, bacteremia, epiglottitis, or pneumonia.

Laboratory criteria for diagnosis (confirmation): Isolation of *H. influenzae* from a normally sterile site (e.g., blood or cerebrospinal fluid or, less commonly, joint, pleural, or pericardial fluid).

Case classification: Only probable and confirmed cases <15 years of age should be reported to CDPH.

Probable: A clinically compatible case with the detection of *H. influenzae* type b antigen in CSF.

Confirmed: A clinically compatible case that is laboratory confirmed (see above).

Additional *H. influenzae* information and case report forms can be found on the CDPH website at:

[http://www.cdph.ca.gov/HealthInfo/discond/Pages/HaemophilusInfluenzaetypeb\(Hib\).aspx](http://www.cdph.ca.gov/HealthInfo/discond/Pages/HaemophilusInfluenzaetypeb(Hib).aspx)

Disease reporting and case investigation

The purpose of surveillance is to monitor the disease burden of *H. influenzae* and the long-term efficacy of Hib vaccine.

1. Confirm report that suspected case(s) meets case definition and/or is highly suspected.
2. Collect lab specimen(s) for diagnosis from case and ensure that typing of the isolate is being done.
3. Forward isolates associated with invasive disease in cases <5 years (and also from cases 5-14 years of age, if possible) to the CDPH Microbial Diseases Lab.
4. Start antibiotic treatment of case.
5. Identify and notify close contacts of Hib cases.
6. When indicated, prophylaxis of contacts should be initiated as soon as possible given that most secondary cases in households occur during the first week after hospitalization of the index case. It may sometimes be necessary to consider prophylaxis for at-risk contacts of a person with invasive *H. influenzae* when the serotype is unknown.
7. Vaccinate children who are not up-to-date for Hib.
8. Active surveillance of contacts of Hib cases. Careful observation of exposed unimmunized or incompletely immunized household, child care or nursery contacts is essential. Exposed children in whom a febrile illness occurs should receive prompt medical evaluation (for reference, see page 312 of the 2006 Red Book).
9. Report both confirmed and probable invasive *H. influenzae* cases <15 years of age to CDPH.

Recommended case management

Initial treatment for children with meningitis possibly caused by Hib is cefotaxime or ceftriaxone. Meropenem or the combination of ampicillin and chloramphenicol are alternative empiric regimens.

For antimicrobial treatment of other invasive *H. influenzae* infections, including those caused by strains other than type b, recommendations are similar. For additional treatment recommendations, see the AAP Red Book.

Isolation of patients with invasive Hib disease

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

Chemoprophylaxis for contacts of cases of invasive Hib disease*

The risk of invasive Hib disease is increased among unimmunized household contacts <4 years of age.

Rifampin eradicates Hib from the pharynx in approximately 95% of carriers and decreases the risk of secondary invasive disease in exposed household contacts.

Note: Treatment of Hib disease with cefotaxime or ceftriaxone generally eradicates Hib colonization, eliminating the need for prophylaxis of the index patient. Indications and guidelines for chemoprophylaxis in different circumstances are described in the AAP Red Book and summarized in the table below.

Chemoprophylaxis is not recommended for contacts of people with invasive disease caused by non-Hib strains.

Indications for Rifampin¹ chemoprophylaxis for contacts² of index cases of invasive Hib disease

- Recommended for all nonpregnant household contacts in the following circumstances:
 - Household with a child <4 years of age (not including the case) who is unimmunized or incompletely immunized³.
 - Household with a child <12 months of age who has not received the primary series.
 - Household with an immunocompromised child, regardless of that child's Hib vaccination status.
- Nursery school and childcare center contacts, regardless of age, when ≥ 2 cases of Hib invasive disease have occurred within 60 days.
- If index case is <2 years of age or a member of a household with a susceptible contact and has been treated with a regimen other than cefotaxime or ceftriaxone, chemoprophylaxis is usually provided just before hospital discharge.

¹20 mg/kg; maximum dose 600 mg qd x 4 days. The dose for infants <1 month of age has not been established; some experts recommend 10 mg/kg. Each adult dose is 600 mg.

²Defined as people residing with the index case or nonresidents who spent ≥ 4 hours with the index case for at least 5 of the 7 days preceding the day of hospital admission of the index case.

³Complete vaccination is defined as having had at least 1 dose of conjugate vaccine at ≥ 15 months of age; 2 doses between 12 and 14 months of age; or a 2 or 3 dose primary series when <12 months with a booster dose at ≥ 12 months of age.