

## Invasive *Haemophilus influenzae* Type B Infections Among Unvaccinated Children

<b>DATE:</b>	12/23/2021
<b>TO:</b>	Health Alert Network
<b>FROM:</b>	Keara Klinepeter, Acting Secretary of Health
<b>SUBJECT:</b>	<b>Invasive <i>Haemophilus influenzae</i> Type B Infections Among Unvaccinated Children</b>
<b>DISTRIBUTION:</b>	Chester, Lancaster, Lebanon, and York Counties
<b>LOCATION:</b>	n/a
<b>STREET ADDRESS:</b>	n/a
<b>COUNTY:</b>	n/a
<b>MUNICIPALITY:</b>	n/a
<b>ZIP CODE:</b>	n/a

**This transmission is a “Health Advisory”, provides important information for a specific incident or situation; may not require immediate action.**

**HOSPITALS:** PLEASE SHARE WITH ALL MEDICAL, PEDIATRIC, NURSING AND LABORATORY STAFF IN YOUR HOSPITAL; **EMS COUNCILS:** PLEASE DISTRIBUTE AS APPROPRIATE; **FQHCs:** PLEASE DISTRIBUTE AS APPROPRIATE **LOCAL HEALTH JURISDICTIONS:** PLEASE DISTRIBUTE AS APPROPRIATE; **PROFESSIONAL ORGANIZATIONS:** PLEASE DISTRIBUTE TO YOUR MEMBERSHIP; **LONG-TERM CARE FACILITIES:** PLEASE SHARE WITH ALL MEDICAL, INFECTION CONTROL, AND NURSING STAFF IN YOUR FACILITY

- As of December 17<sup>th</sup>, the Pennsylvania Department of Health is reporting 3 confirmed cases of invasive *Haemophilus influenzae* type b (Hib) infections among unvaccinated children.
- Healthcare providers should have a heightened awareness for Hib infections, especially among those who are unvaccinated, and be prepared to promptly recognize and treat the disease.
- Chemoprophylaxis should be initiated within 2 weeks of onset of disease and may be in conjunction with treatment, in consultation with an infectious disease healthcare provider.
- Healthcare providers should report invasive cases of *H. influenzae* of any type within 24 hours of diagnosis through PA-NEDSS or by calling 1-877-PA-HEALTH (1-877-724-3258) or your local health department.

This Health Advisory provides information about *Haemophilus influenzae* type b (Hib) infections in children. This advisory is based on information from the [Centers for Disease Control and Prevention \(CDC\)](https://www.cdc.gov). The Pennsylvania Department of Health (DOH) provides this guidance based on available information and is subject to change.

As of December 17<sup>th</sup>, the DOH has received three reports of invasive Hib infections in 3 unvaccinated children. These children reside in Amish communities in southcentral and southeastern Pennsylvania. Low rates of vaccination in this population combined with seasonal community events may result in additional cases of Hib.

## Epidemiology

*Haemophilus influenzae* type b, or Hib, can cause a variety of diseases from mild respiratory infections to more severe illness such as meningitis (inflammation of the coverings of the spinal column and brain), blood stream infections, pneumonia, arthritis, and infections of other parts of the body. Hib spreads person-to-person either through exposure to respiratory droplets or direct contact with respiratory secretions from infected or colonized individuals.

Prior to the availability of the Hib vaccine, Hib disease was the leading cause of bacterial meningitis among children under 5 years old in the United States. In 2019, there were an estimated 7,130 cases of invasive Hib resulting in 1,050 deaths nationwide.<sup>1</sup> Due to widespread Hib vaccination in children, most cases now occur among the elderly and unvaccinated children. In Pennsylvania, there are an average of 5 invasive Hib infections in children each year. In the prevaccination era, hearing impairment or other neurological sequelae occur in 15-30% of survivors. Case fatality ratio is 3%- 6%, despite appropriate antibiotics.<sup>2</sup>

## Risk Factors

Hib disease can occur in any age group. Children who are household or daycare contacts of an individual who is infected or colonized with Hib are at increased risk for infection, with those under 4 years old at greatest risk. Invasive Hib disease is most likely to occur in those who are:

- Younger than 5 years old and with incomplete Hib immunization
- Functional or anatomic asplenia, including sickle cell disease
- HIV infection
- Antibody and complement deficiency syndromes
- Hematopoietic cell transplant recipient
- Chemotherapy or radiation therapy for malignancy

## Clinical Presentation and Diagnosis

Infections with Hib range from mild to moderate, noninvasive disease to more severe, invasive disease. The most common clinical syndromes caused by Hib include:

- Meningitis
- Bacteremia
- Otitis media
- Epiglottitis
- Uvulitis
- Pneumonia
- Pericarditis
- Septic arthritis
- Cellulitis

Diagnostic testing of possible invasive Hib infections is recommended as Hib infections may present similarly to other infectious disease such as influenza or COVID-19. For patients with invasive disease, the diagnosis of Hib infection should be confirmed by PCR-based assays or culture. Ideally, clinical specimens for testing should be collected prior to initiation of antibiotics.

## Treatment and Prophylaxis

Beta-lactam antibiotics are the preferred empiric treatment for Hib infections, however, fluoroquinolones, macrolides, and tetracyclines typically have activity against *H. influenzae*. Due to rising ampicillin resistance, intravenous third-generation cephalosporins, such as ceftriaxone or cefotaxime, are recommended for invasive Hib infections.

Post-exposure chemoprophylaxis with rifampin may be indicated for all close contacts of an individual with invasive Hib. Close contacts are defined as individuals who live with the individual with invasive Hib infection or spent  $\geq 4$  hours with the individual with invasive Hib for at least 5 out of the 7 days prior to the patient's hospitalization. Chemoprophylaxis is recommended for all households who meet the following criteria, at least one child (index case or household member):

- <12 months old who has not completed the primary Hib vaccine series
- <4 years old who has not received an age-appropriate number of doses of Hib conjugate vaccine
- <18 years old who is immunocompromised

For households that meet these criteria, all close contacts should receive prophylaxis, regardless of age. Chemoprophylaxis may be considered for childcare or school contacts following one case of invasive Hib infection. It is recommended in facilities and schools where unvaccinated or incompletely vaccinated children attend and  $\geq 2$  cases of invasive Hib have occurred within 60 days. Post-exposure chemoprophylaxis of contacts, where indicated, should be initiated as soon as possible and without waiting for serotyping results.

Additionally, to eradicate nasopharyngeal carriage of Hib, chemoprophylaxis is recommended for the individual with invasive Hib infection if they did not receive at least one dose of ceftriaxone or cefotaxime and they meet one of the following criteria:

- Younger than 2 years old, OR
- Resides in household with at least one contact <4 years old who has not received an age-appropriate number of doses of Hib conjugate vaccine

Chemoprophylaxis should be initiated within 2 weeks of onset of disease and may be in conjunction with treatment, in consultation with an infectious diseases healthcare provider.

## Prevention

Timely Hib vaccination of young children is important for the prevention of Hib infections. Infants may receive their first dose of Hib vaccine as early as 6 weeks old. All children should receive their primary vaccine doses from 2 through 6 months old and a booster dose at 12-15 months old. Guidelines for Hib vaccination including routine and catch-up vaccine schedules can be found in the [Haemophilus influenzae type b \(Hib\) ACIP Vaccine Recommendations](#).

## Reporting

Healthcare providers are reminded to report suspected invasive Hib cases through PA-NEDSS or by calling 1-877-PA-HEALTH (1-877-724-3258) or your local health department. All invasive *H. influenzae* disease should be assumed to be Hib until proven otherwise and all isolates must be sent to the Pennsylvania Department of Health's Bureau of Laboratories to be serotyped.

If you have questions about this guidance or would like to consult about a patient with suspected invasive Hib infection, please call your local health department or **1-877-PA-HEALTH (1-877-724-3258)**.

**Individuals interested in receiving further PA-HANs are encouraged to register at <https://www.health.pa.gov/topics/prep/PA-HAN/Pages/HAN.aspx>.**

Categories of Health Alert messages:

**Health Alert:** conveys the highest level of importance; warrants immediate action or attention.

**Health Advisory:** provides important information for a specific incident or situation; may not require immediate action.

**Health Update:** provides updated information regarding an incident or situation; unlikely to require immediate action

This information is current as of December 23, 2021 but may be modified in the future. We will continue to post updated information regarding the most common questions about this subject.