

Haemophilus influenzae type b (Hib): Questions and Answers



INFORMATION ABOUT THE DISEASE AND VACCINES

What causes Hib disease?

Hib disease is caused by a bacterium, *Haemophilus influenzae* type b. There are six different types of these bacteria (a through f), in addition to nontypeable *Haemophilus influenzae*. The most serious form of infection is invasive disease, referring to an infection in a normally sterile site, such as the bloodstream or the covering of the brain (meningitis). Before introduction of a vaccine, type b organisms accounted for 95% of all cases of invasive *Haemophilus influenzae* disease, and this is the only type against which the Hib vaccine protects.

How does Hib disease spread?

Hib disease is spread person-to-person by direct contact or through respiratory droplets. Usually the organisms remain in the nose and throat, but occasionally the bacteria spread to the lungs or bloodstream and cause a serious infection in the individual.

How long does it take to show signs of Hib disease after being exposed?

The incubation period of Hib disease is not certain, but could be as short as a few days.

What are the symptoms of Hib disease?

A person with invasive Hib disease can have different symptoms depending on what body systems are affected. (See next question.)

How serious is Hib disease?

Invasive Hib disease can be very serious. Before the highly effective Hib vaccine was introduced, 50%–65% of cases of invasive Hib disease were Hib meningitis, an infection of the membranes covering the brain. Symptoms of meningitis include fever, stiff neck, and altered mental status. Between 3%–6% of children with Hib meningitis die. Among those who survive, up to 3 in 10 have permanent neurologic damage, including hearing loss, blindness, or other mental disabilities.

During the prevaccine era, 17% of invasive Hib cases

had epiglottitis, an infection and swelling in the throat capable of causing life-threatening airway blockage. Hib could also cause pneumonia, joint infection, skin infection, and bone infection.

Two tragic incidents showing the seriousness of Hib were reported from both Minnesota and Pennsylvania in early 2009. Minnesota reported a total of five cases of invasive Hib disease in children younger than 5 years from 2008, the largest number since 1992. Three of the children had not been vaccinated because of parent/guardian deferral or refusal. One of these children died. In Pennsylvania, seven cases were reported for the six-month period from October 2008–March 2009. Only one child had received any vaccine (1 dose) and 3 of the children died.

How do I know if my child has Hib disease?

The diagnosis of Hib disease is usually made based on one or more laboratory tests using a sample of infected body fluid, such as blood or spinal fluid.

Is there a treatment for Hib disease?

Hib disease is treated with antibiotics. Most people with Hib disease require hospitalization. Even with antibiotic treatment, 3%–6% of all children with Hib meningitis die from the disease.

How common is Hib disease in the United States?

Before the introduction of a Hib vaccine, *H. influenzae* type b (Hib) was the leading cause of bacterial meningitis among children younger than age five years in the United States. Every year about 20,000 children younger than age five years got invasive Hib disease and about 1,000 children died. More than half of children who developed invasive Hib disease were younger than age 12 months.

From 1996 through 2000, an average of 68 reported cases of Hib disease occurred in children younger than age 5 years each year. By 2022, this number had

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dropped to just 17 cases and, although some of the 273 cases with unknown serotype could have been due to Hib, the significant decline in incidence (>99%) since the pre-vaccine era is truly remarkable.

Can you get Hib disease more than once?

Yes. A child with Hib disease may not develop protective levels of antibodies. Children younger than age 24 months who have recovered from invasive Hib disease should be considered unprotected and receive the Hib vaccine as soon as possible.

When did Hib vaccine become available?

The first Hib vaccine was licensed in the United States in 1985; however, it was not very effective in children age 18 months and younger. The first improved Hib vaccine, a conjugate vaccine, was licensed in December 1987.

What type of vaccine is it?

The Hib conjugate vaccine is an inactivated vaccine. It is made by chemically bonding a polysaccharide (sugar) to a protein. This long chain of sugar molecules makes up the surface capsule of the bacterium.

How is this vaccine given?

The Hib vaccine is given as an injection into the anterolateral thigh muscle (in infants and toddlers) or in the deltoid muscle of older children.

Is there more than one brand of Hib vaccine?

There are several formulations of Hib vaccine, including combination vaccines that include Hib. The number of doses needed depends on the brand of vaccine given.

Who should get this vaccine?

All infants should receive doses of Hib vaccine as part of their routine immunization (unless they have a medical reason not to) beginning at 2 months of age. The 3- or 4-dose series of Hib vaccine should be completed by 15 months of age. However, unvaccinated children 15 through 59 months of age should receive 1 dose of Hib vaccine. As Hib disease is rare in children

older than age five years, Hib vaccine is not routinely recommended for healthy people age five years or older.

Is Hib vaccine recommended for anyone age five years or older?

Vaccination is recommended for previously unvaccinated people age 5 years or older with the following conditions:

- no spleen (or a spleen that does not function normally, as with sickle cell disease)
- HIV
- immunoglobulin (antibody) deficiency
- early component complement deficiency
- use of early component complement inhibitors (e.g., eculizumab [Soliris] or ravulizumab [Ultomiris], and the like)

People who receive a hematopoietic stem cell transplant at any age should be revaccinated, regardless of their history of Hib vaccination.

For details, including dosing schedules, refer to the Hib notes on the current CDC recommended immunization schedules (www.cdc.gov/vaccines/hcp/imz-schedules/index.html).

How many doses of Hib vaccine are required for the childhood series?

Children who begin their vaccination series in infancy need three to four doses, depending on the brand of Hib vaccine used. Children should get Hib vaccine at age two months, four months, six months (depending on the brand of vaccine), and 12–15 months of age. Hib vaccine should never be given to a child younger than six weeks of age, as this might reduce the child's ability to respond to subsequent doses.

My 18-month-old toddler has never received Hib vaccine. Does she still need to get the series?

All unvaccinated children ages 15 through 59 months should receive one dose of Hib vaccine.

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Will receiving the Hib shot protect my baby from ever getting meningitis?

No. Meningitis can also be caused by other viruses and bacteria. Hib vaccine will only protect against meningitis caused by Hib.

Who recommends this vaccine?

The Centers for Disease Control and Prevention (CDC), the American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP), the American Academy of Physician Associates (AAPA), the National Association of Pediatric Nurse Practitioners (NAPNAP), the American College of Obstetricians and Gynecologists (ACOG), and the American College of Nurse-Midwives all recommend this vaccine.

How safe is this vaccine?

There is an extremely rare risk of an unpredictable, serious allergic reaction (anaphylaxis) following administration of any vaccine. Most children have no side effects from Hib vaccination. Some children experience fever or a mild reaction at the injection site, including redness, warmth, or swelling. These side effects resolve without treatment within 2–3 days after vaccination.

How effective is this vaccine?

All the Hib vaccines licensed for use are good at producing immunity to invasive Hib disease. More than 95% of infants will be protected after two or three doses.

Who should NOT receive Hib disease vaccine?

Anyone who has ever had a life-threatening allergic reaction to a previous dose of Hib vaccine or to an ingredient in the vaccine (such as latex, which is present in the vial stopper of some brands of Hib vaccine) should not get another dose.

Children younger than six weeks of age should not get Hib vaccine because a dose given at this time may reduce the infant's response to subsequent doses.

People with a moderate or severe acute illness should postpone receiving the vaccine until their condition has improved.

Can the vaccine cause Hib disease?

No. Only the entire Hib bacterium can cause Hib disease. Hib vaccine is a fractional vaccine, containing only part of the Hib microbe.