Hib

also known as *Haemophilus influenzae* type b

"Gasping for Life": A True Story

"I didn't realize it, but the diseases that they give children shots for still exist," says Kelly Lacek. "Every parent should know these diseases are still a threat."

Kelly and her husband have three children. Ashley, the oldest, was fully vaccinated; Stephen, the middle child, had some but not all vaccinations; and Matthew, the youngest, had only his first round of shots. The Laceks stopped vaccinating their kids after a health care professional they trusted gave them misinformation that caused them not to trust the safety of childhood vaccines.

Acting on this misinformation almost ended in tragedy.

It was April 22, 2006, shortly after his third birthday, when Matthew started having trouble breathing. His parents rushed him to their local hospital. There, a seasoned physician recognized the disease as one he had seen often—more than 20 years ago. Matthew's windpipe was swollen because he was infected with *Haemophilus influenzae* type b—known as Hib.

When it comes to a Hib infection, time is of the essence. Without prompt treatment, Hib disease can be fatal. Matthew immediately had a tube inserted into his windpipe so he could breathe. He spent 6 days in the hospital and eventually made a complete recovery. The Laceks began catching Matthew up on his vaccinations soon afterward. Today, Matthew and Stephen are fully vaccinated.

Since the first Hib vaccine was introduced in the late 1980s, the number of cases in the United States has plummeted. As a result, many doctors have never seen a case of Hib disease.

"We were lucky the doctor at our local hospital recognized Hib," says Kelly. "We later spoke to pediatricians at a children's hospital, and they admitted they might not have identified it so quickly, because Hib is rare now, thanks to vaccination."

The family does not know who Matthew caught the disease from. What the Laceks do know now is that infant immunization is crucial. As Kelly puts it, "There is almost nothing worse than your child suffering and nearly dying from a disease that can be prevented with a vaccine."

Hib is Serious and Potentially Deadly

Hib disease, which is caused by the bacteria *Haemophilus influenzae* type b, can be serious, especially when it causes invasive diseases. Invasive disease means that germs invade parts of the body that normally are free from germs (such as the fluid around the brain and spinal cord). When this happens, disease is very severe. Overall, before Hib vaccine, there were more than 20,000 cases of invasive Hib disease each year. All invasive infections can be life-threatening.

Meningitis (infection of the covering around the brain and spinal cord) is just one of the invasive diseases that can be caused by Hib. The disease also can cause epiglottitis (life-threatening infection that can block the windpipe and lead to serious breathing problems), as well as pneumonia (infection in the lungs).

In the United States, before Hib vaccine was available, about 12,000 children each year—most of them younger than 5 years old—got Hib meningitis. In fact, Hib was the most common cause of bacterial meningitis in this country. As many as 600 of the children who got Hib meningitis each year died, and as many as 4,000 suffered serious life-long disability, including blindness, deafness, or mental impairment.

"Before Hib vaccine was available, a child's risk for getting invasive Hib disease was 1 out of 200 by age 5," says pediatrician Dr. Elizabeth Briere of the Centers for Disease Control and Prevention (CDC). "That's about the same as the risk for polio in the United States before vaccination. Even though we no longer have polio cases in this country, most parents have heard of polio, but they may not have heard of Hib or know how dangerous it can be."

How Hib Spreads

Hib is spread from person to person by direct contact, or by contact with respiratory droplets from a cough or sneeze. Hib can be spread by people who are ill with the disease. More importantly, Hib can be spread by people who have the bacteria in their noses and throats but who do not show symptoms. In fact, this is the most common way that the disease is spread.

Hib Today

The story of Hib today is the story of an amazingly effective and very safe vaccine. "The Hib vaccine that we use now was first recommended for infants and toddlers in the United States in 1991," explains Dr. Anne Schuchat, director of CDC's National Center for Immunization and Respiratory Diseases. "In less than a decade of using this Hib vaccine, the serious disease was nearly wiped out in the United States."

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By 1998, only 54 cases of invasive Hib disease were reported in children younger than 5 years old. Today, with ongoing vaccination, every year there are fewer than 55 cases and fewer than 5 deaths from Hib among children under 5 years of age.

"Despite the success of the vaccine, parents need to remember the disease is still out there. It is common in some countries and so it can spread to the United States. Hib can also spread in this country because Hib bacteria are carried in the noses and throats of people who are not sick from the disease," explains Dr. Schuchat. "So, vaccinating infants and toddlers on time to protect them against Hib disease is crucial. And fully vaccinated children won't spread the disease to others, including infants and toddlers who are too young to have gotten all their recommended doses of Hib vaccine."

Making an Effective Hib Vaccine for Infants

When most of today's moms were infants, the Hib vaccine was not available. But at the time, people were working hard to develop an effective vaccine to prevent needless suffering and death from infection with *Haemophilus influenzae* type b.

To produce immunity, the first Hib vaccines used a sugar-like substance from the surface of the Hib bacteria. Unfortunately, these first Hib vaccines were not very effective because the immune system did not respond well to these substances. Today's Hib vaccines are made by joining the sugar-like substance to other antigens (the parts of germs that cause the body's immune system to go to work) that the immune system responds to very well. This seemingly simple change resulted in vaccines that are very effective in infants and toddlers. In countries where Hib vaccine is used routinely, the disease has been virtually eliminated. Hib vaccine has a long track record of being very safe; it has not been found to cause serious side effects.

Benefits of Hib Vaccine

Getting Hib vaccine as recommended—

- Saves lives.
- Prevents hospitalizations.
- Prevents serious life-long disability such as blindness, deafness, and mental retardation.
- Protects young children for whom the disease can be especially serious.
- Protects the community, especially infants and toddlers who are too young to be fully vaccinated, and people who have weak immune systems.

Risks of Hib Vaccine

- Mild problems include redness, warmth, swelling or pain where the shot is given in up to one out of four children.
- Fever can occur in up to 1 out of 20 children.

Selected References

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Hib Vaccination Can't Wait

"Before vaccination to protect against Hib, most of those infected with Hib were infants younger than 1 year old, and infection was most common among infants age 6 through 12 months. That's why the primary doses of Hib vaccine are recommended to be given by 6 months," explains Dr. Briere. Four doses of the Hib vaccine are recommended: one at 2 months, 4 months, and 6 months old, and the final dose at 12 through 15 months old. For one brand of the vaccine, a dose at 6 months is not required. To reduce the number of shots needed at a doctor visit, other vaccines have been combined with Hib vaccine. Your doctor can tell you more about combination vaccines.

Most cases of Hib today are in children who have not received Hib vaccine or who have not been fully vaccinated. "Because Hib disease is still out there in communities, delaying Hib vaccination is dangerous," stresses Dr. Briere. Every child should get each dose of Hib vaccine on time, starting at age 2 months.

"Some children, like those in child care, and Alaska Native and American Indian children, are at increased risk for Hib disease. It's especially important for these infants not to miss Hib vaccinations," says Dr. Briere.

"If a child who has not had all doses of Hib vaccine on time becomes ill, parents should make sure to tell paramedics, nurses, or doctors that their child is not fully vaccinated against Hib so that the possibility of illnesses such as meningitis and epiglottitis caused by Hib can be considered," adds Dr. Meg Fisher of the American Academy of Pediatrics.

Understanding Bacterial Meningitis

Meningitis is an infection of the covering around the brain and the spinal cord. The results of meningitis can be devastating, and can lead to life-long disability—including intellectual disability—or death.

Before Hib vaccine, Hib was the leading cause of bacterial meningitis in the United States. Hib used to cause about 12,000 cases of meningitis every year, but thanks to the vaccine, Hib meningitis is now rare.

Now, the leading causes of bacterial meningitis are two other bacteria, *Streptococcus pneumoniae* and *Neisseria meningitidis*. The good news: there are also vaccines to prevent infection with these bacteria. The pneumococcal conjugate vaccine is recommended for infants and toddlers and the meningococcal conjugate vaccine is recommended for children starting at age 11 years.

Diagnosing bacterial meningitis usually requires a spinal tap, in which a needle is used to take out some of the fluid that surrounds the spinal cord for testing. Typical signs of meningitis include stiff neck, severe headache, and changes in mental function. In infants, these signs can be difficult to detect, if they happen at all. Infants with meningitis may appear inactive or irritable. They may also vomit or not eat much. The spinal tap helps doctors determine whether this serious infection is present.

The Centers for Disease Control and Prevention, the American Academy of Family Physicians, and the American Academy of Pediatrics strongly recommend vaccines.

800-CDC-INFO *(800-232-4636)* **http://www.cdc.gov/vaccines**