



In the spring of 2005, two new vaccines to prevent tetanus, diphtheria and pertussis (whooping cough) in teenagers and adults were licensed and recommended. These vaccines, called Tdap, will, for the first time in our history, protect teenagers and adults against pertussis.

Q. What is Tdap?

A. Tdap is a combination of three vaccines that protect against tetanus, diphtheria and pertussis (whooping cough).

Tetanus, also known as lockjaw, is caused by a bacterium found in the soil. Tetanus bacteria produce a toxin (poison) that causes painful muscle spasms. The tetanus vaccine is the only vaccine that prevents a disease that is not passed from person to person.

Diphtheria is also caused by a bacterium that produces a powerful toxin. The toxin can invade the heart, kidneys and nervous system. It usually causes a thick coating on the back of the throat that makes it difficult to swallow and breathe. Diphtheria is very contagious and is spread by coughing and sneezing.

Pertussis is also caused by a toxin-producing bacterium. These toxins primarily damage the lungs. People with pertussis usually have painful spasms of coughing. In some cases, the coughing can be so severe that people crack their ribs. Like diphtheria, pertussis is highly contagious and is spread by coughing and sneezing.

Q. Why is Tdap necessary for teenagers and adults?



A. Tdap is the first vaccine to protect teenagers and adults against pertussis. The history of pertussis vaccines in the United States is long and complicated.

In the 1920s, vaccines to protect against diphtheria, pertussis and tetanus became available. In the 1940s, these three vaccines were combined into a single shot (called DTP).

The pertussis component of the DTP vaccine was made by killing whole pertussis bacteria with the chemical formaldehyde. The pertussis part of DTP was called "whole-cell" pertussis because whole bacteria were used to make it. The vaccine was given to young children and dramatically reduced the incidence of hospitalizations and deaths caused by pertussis. However, the vaccine also rarely caused side effects that could be severe, such as seizures, high fever and persistent crying.

In the 1990s, a safer pertussis vaccine became available. This vaccine was made by purifying several pertussis proteins and inactivating them with formaldehyde. Because this new pertussis vaccine was purer and didn't contain whole bacteria, it was called the acellular pertussis vaccine (or aP). This new pertussis vaccine was combined with the diphtheria and tetanus vaccines in a combination called DTaP. The new DTaP vaccine caused fewer and less frequent side effects, so it replaced DTP and was recommended for all young children. Unfortunately, the DTaP vaccine couldn't be used in teenagers and adults because side effects from the vaccine (such as fever, headache, fatigue, and pain and swelling at the site of injection) were common in anyone 7 years of age or older.

Although the DTP and later DTaP vaccines prevented pertussis in young children, immunity to pertussis faded. As a consequence, the disease is still common in teenagers and adults. Every year, as many as 1 million teenagers and adults in the U.S. are infected with pertussis.

Researchers found that by reducing the quantities of diphtheria and pertussis proteins contained in the vaccine, teenagers and adults didn't experience the high rate of side effects found with DTaP. The designation "Tdap" reflects the fact that the vaccine contains a lower quantity of the diphtheria protein (hence the lower case "d") and lower quantities of pertussis proteins (hence the lower case "p"), than DTaP.

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Tdap: What you should know

Q. If pertussis is so common in teenagers and adults, why do I never hear about it?

A. Although pertussis is common in teenagers and adults, doctors rarely diagnose the disease. Most people with prolonged coughing illnesses are told they have a viral illness or bronchitis. But pertussis is common, accounting for as many as 10 percent of cough illnesses lasting at least one week. Of interest, almost all teenagers and adults infected with pertussis will cough for at least three weeks and about half will cough for at least nine weeks. (In China, pertussis is called the “100-day cough.”)

Q. Is pertussis more serious in babies?

A. Yes. Because an infant’s windpipe is much smaller than that of older children, babies are much more likely to die from pertussis. Babies typically catch the disease from teenagers and adults living in the same home. Approximately 15 to 20 babies in the U.S. die every year from pertussis. Almost all are younger than 4 months of age — too early to have been fully protected by the DTaP vaccine. The availability of Tdap will finally allow teenagers and adults to be protected against the disease and reduce the chance that babies will be infected with the bacterium.

Q. Who should get Tdap?



A. Tdap is recommended for all teenagers beginning at 11 or 12 years of age. Adults may also receive a single dose of Tdap to replace their next tetanus booster.

This information is provided by the Vaccine Education Center at The Children’s Hospital of Philadelphia. The Center is an educational resource for parents and healthcare professionals and is composed of scientists, physicians, mothers and fathers who are devoted to the study and prevention of infectious diseases. The Vaccine Education Center is funded by endowed chairs from The Children’s Hospital of Philadelphia and Kohl’s Department Stores. The Center does not receive support from pharmaceutical companies.

Q. Is the Tdap vaccine safe?

A. Yes. Most people experience pain at the site of injection, and some have swelling. Also, some people given Tdap develop headaches and fatigue. However, the vaccine does not cause any serious side effects.

Q. Does Tdap prevent pertussis?

A. Yes. In medical studies, Tdap was shown to decrease the incidence of pertussis by more than 90 percent.

Q. My teenager already got a vaccine called Td. Does he still need the Tdap vaccine?



A. Yes. A vaccine to prevent tetanus and diphtheria, called Td, is also available for teenagers and adults. Many teenagers have already gotten this vaccine. Because Td doesn’t protect against pertussis, Tdap is still recommended. Tdap should be given at least five years after receiving

Td; however, if the risk of infection with pertussis is likely (for example, during pertussis outbreaks), this interval may be shortened.

Q. Can Tdap be given at the same time as the meningococcal vaccine that is also recommended for teenagers?

A. Yes.



Vaccine Education Center at
The Children’s Hospital of Philadelphia

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