



Tetanus

Tetanus vaccine

Tetanus (Lockjaw) is caused by toxin-producing spores of a bacterium, *Clostridium tetani* that inhabit the soil and the bowels of animals and humans. Unlike other vaccine-preventable diseases, it is not spread from person to person. Tetanus infection is most often the result of wound contamination in an unimmunized person or someone who has not had vaccine boosters in many years. Tetanus may occur following delivery in the newborn babies of unimmunized women. It may also occur following puncture wounds, animal bites, burns, abrasions and surgery.

The tetanus toxin causes severe muscle contractions, or spasms. Fever, sweating, elevated blood pressure, and rapid heart rate may also occur. Spasms of the vocal cords or the muscles of respiration can interfere with breathing, and pneumonia is common. Contraction of muscles can be so severe that the spine or other bones are fractured.

There are between 40-60 cases of tetanus reported in the United States each year, and 30% of those infected die. Death is more likely in newborn infants of unimmunized mothers and patients over 50 years of age. Before the vaccine was available there was an average of 580 annual cases of tetanus and 472 annual deaths. With the vaccination, we now have a 93% reduction in occurrence of tetanus and a 99% reduction in fatalities resulting from tetanus.

Who should not receive the vaccine?

- Most infants and children younger than seven years of age should receive DTaP beginning at two months of age.
- For children who are younger than 7 years of age for whom there is a reason to not give a pertussis-containing vaccine, the TD can be administered.
- Children seven to nine years of age, who are incompletely immunized, should receive Tdap vaccine. Previously unimmunized children between seven and nine also should receive a dose of Td vaccine one to two months later and then another dose of Td vaccine 6-12 months later.
- 11-18 year olds should receive a dose of Tdap. The preferred age for Tdap vaccination is 11-12 years. Detailed recommendations for the use of Tdap for preteens and adolescents are available from the CDC.
- Adults 19-64 years of age should also receive a single dose of Tdap to replace a single dose of Td for booster immunization if their most recent tetanus toxoid-containing vaccine was 10 or more years earlier. Tdap may be given at an interval shorter than 10 years since the last tetanus and diphtheria toxoids-containing vaccine in order to protect against pertussis, especially for:
 - Women <65 years of age who might become pregnant.

- Women who have not previously received Tdap (including those who are breast feeding) should receive Tdap as soon after birth as is feasible. Many experts also recommend that Tdap be considered for pregnant teenagers.
- Adults who have or anticipate having close contact with an infant aged <12 months should receive a single dose of Tdap and trivalent inactivated influenza vaccine. Ideally the vaccines should be given at least 2 weeks before contact. Health-care personnel who have direct patient contact should receive a single dose of Tdap.
- Td vaccine should be administered every 10 years to provide continued immunity against diphtheria and tetanus and for increased tetanus risk for a tetanus-prone injury if more than 5 years have elapsed since the last dose of a tetanus toxoid-containing vaccine.

This vaccine is recommended by:

- Advisory Committee on Immunization Practices of the Centers for Disease Control and Prevention
- American Academy of Pediatrics
- American Academy of Family Physicians

The complete childhood immunization schedule can be found at:

<http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm>

Dose Schedule

A DTaP vaccine is given to most children at two, four, and six months of age. A fourth dose of DTaP is given between 15 and 18 months (17-20 months for Daptacel), and a fifth dose is given at age four to six years. Pediarix™ can only be given for the first three doses a child receives. TriHIBit is only licensed for use as a booster dose for children 15-18 months of age. Pentacel is not licensed for use in children over 4 years of age.

If the fourth dose was given after age four years, then no fifth dose is needed. Receiving combination vaccines from different manufacturers, which may include different component vaccines, can make the dose schedule more complex. However, since giving combination vaccines means fewer shots overall for a child, healthcare providers will usually choose to administer them. Healthcare professionals should attempt to select vaccines for their patients, especially children who have been seen by others, based on what they have already been given.

Children younger than age seven who should not receive the pertussis vaccine should receive the DT (diphtheria-tetanus) vaccine.

Between the ages of seven and nine, Tdap, which contains the same amount of tetanus vaccine as in DTaP or DT, but contains much less diphtheria toxoid—is given to protect against tetanus, diphtheria and pertussis. Previously unimmunized children between the ages of seven and nine also should receive a dose of Td one to two months later and then another dose of Td 6 to 12 months later.

At age 11-12 years, a booster shot of tetanus-diphtheria-acellular pertussis (Tdap) is needed. It should be given no later than 16 years of age. Every 10 years thereafter, a booster of Td is needed to maintain protection against diphtheria and tetanus.

One booster dose of Tdap is recommended for adults to replace a Td booster. Every 10 years thereafter, a booster of Td is needed to maintain protection against diphtheria and tetanus.

Effectiveness of the Vaccine

The DTaP vaccine is 95% effective in preventing all three diseases that it immunizes against—diphtheria, tetanus and pertussis. It is virtually 100% effective in preventing tetanus, while the protection rates for diphtheria and pertussis are lower. Immunity against tetanus lasts about 10 years; therefore a booster dose of Td (tetanus-diphtheria) vaccine is needed every 10 years to maintain immunity.

Known Side Effects

The DTaP vaccine is 95% effective in preventing all three diseases that it immunizes against—diphtheria, tetanus and pertussis. It is also about 95% effective in preventing diphtheria, while the protection rates are lower for pertussis and higher for tetanus. Immunity against diphtheria lasts about 10 years; therefore a booster dose of Td (tetanus-diphtheria) vaccine is needed every 10 years to maintain immunity. If exposed to diphtheria, partially immunized individuals can acquire the disease, although generally it is less severe than in unimmunized people.

Related Issues

Tetanus in newborn infants, once common throughout the Americas, is prevented if the mother has been immunized. This is because an immune mother passes antibodies to the baby across the placenta. The mother is immune if she has been immunized before becoming pregnant or during pregnancy. An expectant mother whose tetanus immunization status is uncertain or whose last immunization was more than 10 years ago should be immunized against tetanus. This is usually given combined with diphtheria toxoid vaccine (a product called Td).

Recently a new vaccine that also contains vaccine for pertussis for adults, Tdap, has been licensed for use for women in the child-bearing age group. Pregnancy is not a contraindication to Tdap immunization. However, at this time, CDC recommends that pregnant women who received the last tetanus toxoid-containing vaccine less than 10 years ago receive Tdap in the post-partum period according to the routine vaccination recommendations, and if the last dose of tetanus toxoid-containing vaccine was more than 10 years previously, that they would give preference to her being immunized with Td during the second and third trimester in preference to Tdap.

For more information about this subject please check:

The Center for Disease Control at www.cdc.gov/

The American Academy of Pediatrics at www.aap.org