



MAX HEALTH MAINE, LLC A FAMILY PRACTICE

In the United States, there are several vaccines that are routinely recommended for children and adolescents between the ages of 7 and 18 years. These include vaccines for *Neisseria meningitidis* (meningococcus), tetanus-diphtheria-acellular pertussis, varicella, and for girls, human papillomavirus. Some children/adolescents will also need a second dose of varicella vaccine if two doses are not given before age seven; influenza vaccine is recommended annually; and males may also now receive human papillomavirus vaccine series of three.

INFLUENZA — Commonly known as flu, influenza is a highly contagious viral infection that occurs in outbreaks worldwide, usually during the winter in the United States. Young children and those with certain underlying medical conditions are at increased risk for severe or complicated influenza infection. Immunizing all children (and adults) can help decrease this risk. You should get your FLU vaccine in the late summer or fall, but do not avoid getting even if it is late in the season.

Timing and dose — There are two types of influenza vaccine; one is injected, while the other is given as a nasal spray. The injection is approved for adults and children six months and older, while the intranasal spray is approved only for people between 24 months and 49 years of age. People who have a weakened immune system or who have chronic heart, lung, kidney, or metabolic disease should not use the intranasal spray since it contains live virus that has been weakened. In very rare situations, household contacts of those who have **severely** weakened immune systems should also not receive the intranasal spray.

The influenza viruses change every year, which means that a reformulated vaccine must be given every year (in the fall). In the first





MAX HEALTH MAINE, LLC A FAMILY PRACTICE

year that a child (younger than age 9 years) receives the vaccine, two doses are recommended; the second dose is given at least one month after the first. The influenza vaccine does not prevent illnesses such as the common cold or strep throat.

The vaccine is recommended for all children between 6 months and older, particularly those who:

- Have chronic medical conditions (eg, lung or heart disease, diabetes, kidney disease, weakened immune conditions, nervous system disorders)
- Live with a person who is at high risk for complications of influenza (eg, someone with chronic lung disease)

Influenza vaccine precautions — Both forms of the influenza vaccine are prepared with chicken eggs. Thus, children who have had a severe allergic reaction to chicken or egg proteins should not be given the vaccine. However, for children with a history of these allergies, the vaccine may be given under supervision of an allergist.

Injectable influenza vaccine precautions — Vaccination may be delayed in children with moderate to severe illness until their symptoms have resolved. However, the vaccine does not need to be delayed in children with mild illnesses. The most common side effect of the injectable vaccine is redness and soreness at the injection site. A low-grade fever may develop after vaccination.

Nasal spray influenza vaccine precautions — The nasal spray form of influenza vaccine is not recommended for children who take aspirin daily or those with a weakened immune system, asthma, and other conditions (eg, chronic lung or heart problems, pregnancy, chronic metabolic disease, kidney dysfunction, and blood disorders), or a history





MAX HEALTH MAINE, LLC A FAMILY PRACTICE

of Guillain-Barré syndrome. It may be necessary to delay the nasal vaccine or to use the injectable vaccine in children or adolescents with nasal congestion.

Influenza vaccine effectiveness — The injectable influenza vaccine protects between 70 and 90 percent of healthy children from developing laboratory-confirmed influenza infection.

MENINGOCOCCAL — *Neisseria meningitidis* (meningococcus) is a bacterium that can cause meningitis and meningococemia. Meningitis is an inflammation of the tissues surrounding the brain and spinal cord that causes symptoms of a stiff and painful neck. Meningococcus is the most common cause of bacterial meningitis in the United States.

Meningococemia is a serious infection of the bloodstream that can begin with dramatic rash and fever and lead to shock and death. Meningitis and meningococemia may occur separately or together.

In the United States, approximately 1000 to 3000 cases of meningococcal disease occur each year. Large-scale epidemics occur in Africa, parts of Asia, South America, and the countries of the former Soviet Union.

Meningococcus first infects the lining of the nose and pharynx (wind pipe) and is transmitted from person to person by respiratory secretions (eg, from coughing, sneezing). Meningococcal infection is contagious and can spread quickly to close contacts of a person who is infected. This includes household members and anyone who kisses or shares toothbrushes or eating utensils.

Meningococcal disease can be treated in most people. However, the illness is frequently mistaken for a common viral illness (eg, cold) during the early stages, which often allows it to progress quickly. Serious long-term complications can occur, even in people who are treated promptly.





MAX HEALTH MAINE, LLC A FAMILY PRACTICE

Up to 15 percent of people who become infected die as a result of their infection. In survivors, 10 to 20 percent of patients have long-term complications, including hearing loss, nerve or brain damage, finger/toe amputation, or skin scarring [1].

The meningococcal vaccines only protect against four of the five subtypes of meningococcus. It is possible to become infected with meningococcus despite having received one of these vaccines, although the risk is significantly lower than in someone who is unvaccinated.

Timing and dose — Expert groups recommend the meningococcal vaccine for all children age 11 or 12 years and a booster dose at age 16 years. Adolescents who receive the first dose of meningococcal vaccine between 13 and 15 years should receive a booster dose between 16 and 18 years of age. Those who receive the first dose after age 16 years do not need a booster dose.

Meningococcal vaccine is also recommended for children aged 2 to 10 years who are at increased risk for meningococcal disease. The initial vaccination series consists of two doses; the schedule for a subsequent booster dose for these children depends upon their age at first immunization and whether they remain at increased risk for disease.

Meningococcal vaccine precautions — Approximately 70 percent of people have a local reaction (eg, tenderness, redness) at the injection site.

There is no thimerosal or mercury in the meningococcal vaccine, and there is no risk of becoming infected with meningococcus as a result of the vaccine.

Meningococcal vaccine benefit — The meningococcal vaccine provides protective levels of antibody in 82 to 97 percent of those who are





MAX HEALTH MAINE, LLC A FAMILY PRACTICE

vaccinated (depending upon the particular strain of meningococcus).

TETANUS AND DIPHTHERIA, WITH OR WITHOUT ACELLULAR PERTUSSIS — Diphtheria is a highly contagious disease. It is usually transmitted via droplet particles that are coughed or sneezed into the air. It can cause a thick covering in the back of the throat that can lead to breathing problems or heart failure.

Tetanus is another very serious infection that is caused by the bacterial toxin of *Clostridium tetani* bacterium. The bacteria reside in soil and the intestinal tracts of certain mammals. The bacteria can enter the body through an open wound, multiply, and produce a toxin that can affect nerves controlling muscle activity. A common symptom of tetanus infection is stiffness of the jaw muscles ("lockjaw").

Tetanus and diphtheria disease are rare in the United States because of the high numbers of people who have been immunized. However, the consequences of untreated tetanus or diphtheria can be very serious.

Pertussis, or whooping cough, is an upper respiratory illness caused by the toxin of *Bordetella pertussis* bacteria. The organism is highly contagious, spreads easily and can cause serious illness, especially in infants.

The number of people infected with pertussis is rising to epidemic levels, especially in adolescents, despite widespread vaccination. The Centers for Disease Control and Prevention (CDC) reported over 25,000 cases of whooping cough in the United States in 2005 [2]. Since pertussis is significantly underreported, the number of people actually infected with pertussis each year in the United States is probably closer to 1 to 3 million.

Pertussis was added to the traditional Td booster for teenagers and





MAX HEALTH MAINE, LLC A FAMILY PRACTICE

adults because the vaccine's protection decreases after 5 to 8 years. Protection also decreases after being infected with pertussis. Thus, the vaccine is recommended even for people who have had the disease.

There are several forms of combined diphtheria, tetanus, and pertussis vaccines:

- The DTaP, or diphtheria tetanus acellular pertussis vaccine, is used for routine immunization of children younger than seven years of age.
- The Tdap, or tetanus, reduced diphtheria, acellular pertussis vaccine, is recommended as a routine one-time dose for children at 11 to 12 years and for adolescents 13 to 18 years who were not previously immunized. The vaccine is also recommended as a one-time dose for adults and as one of the series of catch-up doses of tetanus and diphtheria toxoid (Td) vaccines for children between 7 and 10 years of age who are incompletely vaccinated against tetanus, diphtheria, or pertussis.
- The Td, or tetanus and reduced diphtheria vaccine (without pertussis), is recommended for adolescents and adults who require tetanus vaccine and have already received one dose of Tdap.

Timing and dose — A single tetanus-containing booster vaccine is recommended for children and adolescents at age 11 to 12 years; Tdap is recommended unless there is an allergy to one of the vaccine components.

Two Tdap vaccine products are available:

Boostrix™ is approved for use in children and adolescents 10 to 64 years of age





MAX HEALTH MAINE, LLC A FAMILY PRACTICE

ADACEL™ is approved for use in individuals 11 to 64 years of age

Adolescents should **routinely** receive one of the above tetanus-containing vaccines at 11 to 12 years of age. Tdap (Boostrix or ADACEL) is preferred to Td since it provides protection against pertussis. Vaccine protection against pertussis from childhood vaccines diminishes over time, highlighting the importance of the Tdap booster.

If an adolescent has an injury that requires a tetanus shot, Tdap may be given instead of Td, provided that the adolescent has not received Tdap previously. Currently, only one dose of Tdap is recommended in a lifetime. Subsequent booster doses of Td are recommended every 10 years throughout life. **Tdap vaccine precautions** — The most common side effect of the Tdap vaccine is pain at the injection site.

Tdap vaccine effectiveness — Tdap is a very effective vaccine that provides protection against laboratory-confirmed pertussis infection in about 90 percent of adolescents and adults.

The vaccine provides 95 percent protection from diphtheria, and nearly 100 percent from tetanus. Because protection can fade over time, booster vaccines for tetanus and diphtheria are needed at least every 10 years. (See '[Timing and dose](#)' above.)

HUMAN PAPILLOMAVIRUS — Human papillomavirus (HPV) is a virus that is spread by direct skin-to-skin contact, including sexual intercourse, oral sex, anal sex, or any other contact involving the genital area (eg, hand to genital contact). The risk of HPV exposure increases with the number of sexual partners. Up to 80 percent of sexually active adults will become infected with HPV before the age of 50 [3].

Over 100 different types of HPV have been identified, 40 of which are





MAX HEALTH MAINE, LLC A FAMILY PRACTICE

known to infect the cervix and 15 of which are known to cause cancer. Researchers have labeled the HPV types as being high or low risk for causing cervical cancer. HPV types 6 and 11 can cause warts and are low-risk types because they rarely cause cervical or other cancers. Types 16 and 18 are high-risk types and cause most cases of cervical and other types of cancer.

A vaccine against HPV is available for males and females. The vaccine is discussed separately.

VARICELLA (CHICKENPOX) VACCINE — Varicella is a highly contagious viral illness caused by infection with the varicella zoster virus (VZV). The disease causes fever, sore throat, and a distinctive, itchy rash with fluid-filled blisters that later form scabs. Complications of chickenpox can include bacterial infections of the skin, pneumonia, or, less commonly, inflammation of the brain. A vaccine to prevent chickenpox is recommended for all children. Two doses of [varicella vaccine](#) are recommended for children 0 to 6 years of age; the first is usually given at one year of age and the second at four to six years. A second dose is recommended if a child is older than 7 years and was not previously given two doses of vaccine

OTHER VACCINES — Children who are 7 to 18 years may need vaccines other than those mentioned above if they have missed any of the recommended vaccines for children age 0 to 6 years. This may include hepatitis A, hepatitis B, varicella, polio, or measles, mumps, and rubella vaccines . *-from Up To Date.com*

