

DaPT Vaccine

DaPT vaccine protects against diphtheria, pertussis, and tetanus. These are very serious diseases that are difficult to treat.

Diphtheria is a painful, severe infection of the throat and airway. This bacterium produces a powerful toxin which can damage the heart, nervous system, and kidneys. The fatality rate is 10%.

Pertussis (whooping cough) is an infection of the nose, throat, bronchial tubes, and lungs resulting in severe fits of coughing often lasting months. This disease is most dangerous to infants. Seizures, neurological damage, and death can result. Antibiotics are poorly effective.

Tetanus (lockjaw) is an infection usually caused by contamination of wounds by tetanus bacteria. This bacterium produces a toxin which attacks the nervous system resulting in painful muscle spasms and convulsions. Mortality (death) rate is 30 – 50%.

DaPT is a combination of vaccines against these three diseases. Immunization with DaPT starts at about 2 months of age; this is in order to protect our kids as early as possible, at an age when they're most vulnerable. Complete immunization consists of the "primary" series of 3 shots during the first year, plus boosters at 18 – 24 months, and at kindergarten age. Infant DaPT is given as a combination with IPV and HBV vaccines ("Pediatrix"). A version of DaPT called "Tdap" was introduced in 2006 for adolescents and adults.

This vaccine is made from *components* of the three bacteria; it is not a *live* vaccine.

DaPT immunization may cause fever and soreness at the injection site for several days. Other less common reactions include sleepiness, or a lump or "nodule" at the injection site which may last several weeks. DaPT vaccine, like all other vaccines today contains no mercury or thimerosal preservative.

For more information on all the childhood vaccines, you can go online to our website (listed below) and click on the links under "immunizations".

Polio Vaccine

The poliovirus belongs to a large group called enteroviruses which frequently cause illness in late summer and fall. Symptoms often include fever, sore throat, diarrhea, and vomiting. In a small percentage of cases, these viruses can attack the nervous system, causing more severe illness. With *poliovirus*, 90 - 95% of the infections are actually asymptomatic, 4 - 8% are minor illnesses, and only 0.5% cause long-term paralytic disease.

The original polio vaccine developed in the 1950's by Jonas Salk, was a dramatic success and welcomed with great enthusiasm by a fearful American public. Dr Salk was considered a hero during that time. Since then, immunization against polio has been such a success that there have been no cases of polio in the Western Hemisphere since the 1980's.

The vaccine we currently use is **Inactivated Polio Vaccine** or "**IPV**". IPV contains killed virus and is given by injection. It's given as a series of 4 doses with the 1st doses during infancy, and the last one at kindergarten age. The infant doses are given as a combination with DaPT and HBV ("Pedarix").

IPV is extremely safe. Like any immunization, it may cause fever and soreness at the injection site for 1 – 2 days.

For more information on childhood vaccinations, go online to our website listed below and click on the links under "immunizations".

Strep. Pneumonia Vaccine

A vaccine to prevent illness caused by **strep pneumonia bacteria** was approved in March 2000. This vaccine was primarily designed to prevent “invasive disease” from this bacterium: pneumonia, meningitis, and bloodstream infection (sepsis or bacteremia). In addition, these bacteria cause about 30 – 40% of ear infections and sinus infections in children, so we hope to see a reduction in these illnesses as well.

This vaccine (brand name “**Pprevnar**”) is based on an older vaccine called “*Pneumovax*” which has been available for over 20 years. Pneumovax was and still is routinely given to *all* elderly people to prevent pneumonia. Pneumovax was also given to children over age 2 for certain rare indications. The vaccine was not very effective under age 2 and was not part of the routine immunization schedule.

Pprevnar was tested in 37,000 children prior to FDA approval. It was shown to be safe and very effective. It uses a *component* of the bacterial cell to stimulate antibody production by the body’s immune system. It is *not* therefore a “live” vaccine. Pprevnar can cause fever and muscle soreness at the injection site for several days.

This vaccine will *not* protect against strep throat, since this is caused by Group A strep bacteria, not by Strep pneumonia.

Pprevnar is recommended for *all* kids under age 2 years. Between ages 2 – 3, experts in the field recommend immunizing children in daycare or preschool, and also kids 2 – 5 years old in certain designated “high risk” groups. In our practice, we feel that this is a valuable vaccine for *all* kids below age 5 years, and this has been our approach since it became available.

Immunization can start as early as 6 weeks of age. Kids under 6 months require a series of 3 doses and a “booster” at 12 months; for children 7 – 12 months of age, a total of 3 doses are given; from 12 – 23 months, 2 doses; and just 1 dose for kids over 24 months.

For more information on childhood immunizations, go online to our website and click on the links to the Centers for Disease Control or the AAP (American Academy of Pediatrics).

HiB vaccine

HiB vaccine stimulates protective antibody production against a bacterium called **Hemophilus influenzae type B**.

HiB bacteria cause meningitis, pneumonia, epiglottitis (infection & closure of the throat), buccal and orbital cellulitis (infection of the deep tissues of the face or around the eye), septic arthritis, and a few other things as well.

Prior to the availability of HiB vaccine, HiB was the most common cause of bacterial meningitis in children with 12,000 cases per year, a mortality rate of 5%, and permanent neurological damage in 25 - 30%. The average child had a 1 in 20 chance of having serious HiB disease in the first 5 years of life, with the highest risk during the *first year*.

Since the mid 1980's, when HiB immunization started, the number of kids with serious or "invasive" HiB disease has dropped dramatically. The tremendous success of this vaccine is virtually unknown by the general public.

HiB vaccine is extremely safe. Like any immunization, it may cause fever and soreness at the injection site for a few days. HiB vaccine uses a component of the bacterial cell; it is *not* a "live" vaccine. Immunization starts around 2 months of age, with 2 – 3 doses during infancy, and a booster dose at 12 months age.

This vaccine comes in single dose vials and so has no thimerosal or other preservatives.

HiB *bacteria* are unrelated to the common influenza ("flu") *virus* we see every winter. The well-known "flu shot" protects against this virus.

For more information on childhood immunizations, go online to our website (listed below) and click on the links under the heading "immunizations".

Hepatitis B Vaccine

Hepatitis B is a viral infection of the liver. This infection may cause an acute illness with fever, jaundice (yellow skin & eyes), and abdominal pain. Symptoms may range from mild to severe; death may even result. Infection may also result in a chronic carrier state, cirrhosis (scarring), or liver cancer.

The original HBV vaccine developed in the 1980's was targeted at specific high-risk groups thought to be particularly susceptible to HBV. It was thought that this would eliminate HBV from the U.S. However, HBV *continued to spread in spite of this, even infecting individuals with no known risk factors, including children.* In fact, about 50% of cases are in individuals without risk factors. For this reason, medical experts now recommend routine HBV immunization for all children, school districts require it for school admission, and it's part of the routine well immunization schedule for all kids.

The current HBV vaccine is "genetically engineered" and extremely safe. It's given as a series of 3 injections, usually spread out over 6 months. Mild soreness and fever may occur; serious reactions are extremely rare.

HBV vaccine is available in combination with two other routine immunizations, or it may be given separately. We prefer to give the combined version ("Pediatrix") since this reduces the total number of shots that are usually given. Many large studies demonstrate the safety of combined immunizations. Pediarix is usually started at 2 months of age. HBV vaccine may also be given within a few days of birth in some situations.

HBV infection (previously called "serum hepatitis") is much *less* common than hepatitis A ("HAV" or "infectious hepatitis") in the general population, especially children. However, it is much more serious, even deadly; **therefore we *do* recommend routine HBV vaccine for *all* kids.**

For more information on childhood vaccines, go online to our website (listed below) and click on the links under "immunizations".

Rotavirus

Rotavirus illness occurs seasonally every year, mostly during the winter and early spring months. Symptoms are vomiting, diarrhea, and fever. Dehydration is common; if severe, IV rehydration may be needed in the hospital.

Rotavirus is very contagious; it is spread mostly person-to-person. Like most viruses, infectiousness starts even before symptoms are present. Very few virus particles are needed to infect. The virus may persist in stools for up to 3 weeks.

Estimates are that 4 out of 5 children will get rotavirus infection before their 5th birthday. Approximately one half million office visits and 50,000 hospitalizations per year in the U.S. happen because of rotavirus. Worldwide, it's estimated there are half a million deaths per year due to this virus, mostly in "third world" countries.

There is no specific treatment for rotavirus illness. Clear liquids orally to maintain hydration is the key. Medications for vomiting or diarrhea are not especially effective and may have side effects.

A vaccine effective against rotavirus became available during the summer of 2006. Rotavirus vaccine – "RotaTeq" – is a live virus vaccine usually given at 2, 4 and 6 months of age. The 1st dose must be given between 6 weeks and 12 weeks; the last dose no later than 32 weeks.

This vaccine has been thoroughly tested and is extremely safe. It can be given concurrently with the other infant immunizations. Best of all, it is given *orally*.

MMR Vaccine

MMR is a “live” virus vaccine for immunization against measles, mumps, and rubella (“German measles”).

Measles is an acute respiratory infection with a rash. Symptoms include cough, congestion, high fever, conjunctivitis (“pink eye”), and a very widespread, prominent rash. Measles can be very uncomfortable for children and complications are relatively common, especially pneumonia and encephalitis (brain inflammation).

Mumps is an infection of the salivary glands. These glands are adjacent to the mouth and secrete saliva to aid swallowing and digestion. Mumps is mildly uncomfortable but is a frequent cause of meningitis or encephalitis. During or after puberty, this virus may result in impaired fertility from orchitis (inflammation of the testicles), or oophoritis (Inflammation of the ovaries).

Rubella virus causes mild fever and rash. However, infection during pregnancy may result in fetal involvement with congenital deafness, blindness, heart defects, and mental retardation.

MMR vaccine may cause muscle soreness, like any other immunization. Fever and rash may occur 1 – 2 weeks later. Transient arthralgia (joint pains) may happen, especially in adolescent girls. MMR, like all other childhood vaccines now, contains no mercury or thimerosal. Additionally, large well-designed studies have demonstrated no link between MMR and autism or any other neurological problems.

MMR is usually given at 15 months of age. As of fall 2005, MMR is available in combination with varicella (chicken pox) vaccine as one injection (“ProQuad”). However, the amount of varicella virus in Proquad is much higher than in the individual varicella vaccine; for this reason we recommend giving these vaccines separately.

A second MMR vaccination is recommended around 5 years of age. This is to “catch” the tiny percentage of kids who didn’t respond to the 1st dose at 15-18 months age. We have some concern about giving a live virus vaccine to kids when the vast majority of them actually don’t need it. One option we sometimes do is check a child’s immune status with a blood test when they’re a little older. In any case we will discuss this with you at the 5 year well child visit.

Children should not receive MMR if they have any immune deficiency state, or if they are on immunosuppressive therapy. Egg allergy is no longer considered a contra-indication.

For more information on childhood immunizations go online to our website (listed below) and click on the links under “immunizations”.

Varicella (chickenpox) Vaccine

Varicella is a highly contagious viral illness characterized by mild fever followed by an itchy, bumpy rash lasting 5 – 7 days. Chickenpox is not *usually* serious but can be uncomfortable depending on the extent of the rash. Varicella tends to be worse in those with *sensitive skin* or *eczema*. Adolescents and adults also have more difficulty with this disease. Chickenpox may lead to permanent scarring and rarely, more serious complications such as pneumonia, brain inflammation, and “superinfection” with strep or staph bacteria. It is *especially* dangerous for individuals with compromised immune function, including people on cancer chemotherapy or on steroids for whatever reason. Varicella may also cause fetal defects if infection occurs during pregnancy.

In some individuals after chickenpox, the varicella virus may become dormant for years, then activate at a time of stress and cause “**shingles**” (herpes zoster). This is more common in older adults and can be very painful.

Varicella infection can be treated with an oral anti-viral drug called acyclovir (“**Zovirax**”). This medication must be started within 24 – 36 hours to have an effect. The duration of illness is somewhat shorter and the rash milder, but not dramatically so.

Varicella vaccine (“**Varivax**”) was approved in 1995. It is recommended for all children 12 months and over and is part of the regular immunization schedule. Varivax is a live, attenuated (weakened) virus vaccine and very safe. However, like any other immunization, it may cause fever, soreness, and rarely, allergic reactions. Occasionally a mild rash may develop. Like any vaccine, Varivax is not 100% effective. Kids may still get chickenpox after the shot, although it’s usually mild. The vaccine appears to be more effective if given after 15-18 months of age.

As of summer, 2006, a second “booster” dose of Varivax is recommended around kindergarten age. My preference is to delay this 2nd dose until about age 12 to prolong immunity a little longer into adulthood.

Some believe that since chickenpox is a relatively benign illness for the great majority of children, they would actually be better off getting it rather than receiving the vaccine. This argument has some merit, but parents should be aware that as stated above, there are some serious risks with this disease. We *do* suggest that *kids who haven’t had chickenpox by age 11 – 12 years get immunized* for sure.

As of 2001, the state of California requires proof of varicella immunization (or natural infection) prior to school entry at kindergarten. However, parents do have the right to “pass” on this or any vaccine they wish.

The policy of this office is to present the information on Varivax and to offer the vaccine for all kids *over 12 months of age*. We encourage parents to consider the pros and cons and participate in medical decisions involving their children.

For more information on childhood immunizations go online to our website (listed below) and click on the links under the heading “immunizations”.

Hepatitis A Vaccine

Hepatitis A is an acute viral infection of the liver with fever, decreased appetite, nausea, and fatigue. About 70% of children under 6 years of age will have mild or even no symptoms if they get this virus. Older kids and adults are usually symptomatic with illness lasting 10 - 14 days. Jaundice is not usually present in younger patients. Chronic infection does *not* occur.

The hepatitis A virus ("HAV") is spread either person-to-person via poor hygiene, or by contaminated food or water. Most infections probably occur during "common source" outbreaks from, for example, an infected individual working at a restaurant. People with hepatitis A are most contagious 1 – 2 weeks *before* symptoms develop. Although there are no effective medications for hepatitis A, an injection of gamma globulin given within 2 weeks of exposure is 85% effective in preventing symptoms.

Hepatitis A, previously known as "infectious hepatitis", is much easier to catch and transmit to others than hepatitis B. Fortunately, however, it's also much less dangerous.

Hepatitis A vaccine is safe and effective. It is at least 95% protective and immunity is thought to last at least 20 years. This is not a live virus vaccine. The vaccine has been approved for anyone over 2 years of age. It's given as 2 doses, at least 6 months apart. Like any immunization, it may cause fever, soreness at the injection site, or rarely, allergic reactions. HAV vaccine, like all other immunizations now, contains no mercury or thimerosal; no *serious* adverse events have been reported from HAV vaccine.

Who should get this vaccine?

We recommend HAV vaccine for:

- families traveling outside the U.S., particularly for travel to Mexico or the "Third World"
- individuals who surf or otherwise spend significant time in the Bay water in Santa Cruz
- anyone with existing chronic liver problems
- anyone with blood-clotting disorders

In 2005, the CDC recommended that all children over the age of 12 months receive HAV. So far, HAV is not required for school entry.

For more information on HAV and other childhood vaccines, go online to our website (listed below), and click under the heading "immunizations".

HPV (Human Papilloma Virus)

HPV is a common cause of genital warts, cervical dysplasia – growth of abnormal cells in the cervix, and cancer of the cervix. It is spread by sexual contact. Most HPV infections don't cause symptoms and resolve without treatment. However, about 10,000 women develop cervical cancer per year in the U.S. and 3,700 die from it. In addition,

pre-cancerous lesions detected on routine pap smears frequently necessitate further diagnostic procedures which may alter or weaken the cervix; this may increase the risk of premature births for subsequent pregnancies.

HPV vaccine (“Gardasil”) was approved in 2006; it protects against 4 major types of this virus. It's estimated that it will prevent 70% of cervical cancer and 90% of genital warts. This vaccine is “inactivated” (not a live virus vaccine). It is given in a 3-dose series and is recommended for females between 11 and 26 years of age. Gardasil works best when given before females become sexually active. Protection is expected to be long-lasting.

HPV vaccine is being tested on males and will undoubtedly be recommended for them as well in the future.

Gardasil is an extremely safe immunization; however, like any injection, it may cause redness, swelling, soreness, and fever for a few days. HPV vaccine has not been tested on pregnant women and should not be given in this circumstance..

The development of vaccines, along with the practice of antisepsis, clean municipal water supplies, and public sanitation measures have all contributed greatly to improved public health. Gardasil, and to a lesser extent, hepatitis B vaccine, are *anti-cancer* vaccines that represent a major advance for modern medicine.

For more information, refer to the CDC website on our homepage below.

www.healthykidzdoc.yourmd.com

Meningococcal Disease

Neisseria Meningitidis is a type of bacteria which may cause serious, life-threatening illness in children and adults.

Two types of illness are the main concern: blood infection (“bacteremia” or “meningococemia”) and meningitis. These may occur together or separately. Symptoms are fever, body aches, headache, stiff neck, lethargy, vomiting, and rash. These illnesses can present suddenly and progress rapidly. Between 10 – 15% of patients die, even when they’ve been treated appropriately with antibiotics. Complications in survivors include hearing loss, brain damage, and blood clotting abnormalities leading to amputation of arms or legs.

Meningococcal disease is spread mostly person-to-person. Individuals living in close quarters – army barracks, college dorms – are at higher risk from these bacteria.

Meningococcal vaccine – “Menactra” or MCV-4 - became available in 2005. It is recommended for kids 11 years old and up. It’s also recommended for adults up to age 55 with immune system problems. The duration of immunity for this vaccine is unknown. The peak incidence for meningococcal disease is during late adolescence and early childhood. Menactra is currently being tested in kids 2 years and up.

Menactra is an extremely safe vaccine. Like all immunizations, there may be muscle soreness, mild fever, or local reactions. It has not been tested in pregnant women, so MCV-4 should not be given in this circumstance.

Influenza Vaccine

Influenza (the “flu”) is a viral illness characterized by sudden onset of high fever, chills, muscle aches, headache, sore throat, cough, and nasal congestion. Influenza is highly contagious; infectiousness is highest the day prior to symptoms plus the next 2 – 3 days. There are several types of influenza viruses. Types A and B cause outbreaks of illness every winter and spring which cause an estimated 20,000 deaths and 100,000 hospitalizations per year in the U.S. “Antigenic drift” occurs from year to year with influenza viruses; this means the outer protein antigens change slightly and the vaccine must be “updated” yearly.

Influenza can be very uncomfortable for anyone, but it’s particularly dangerous for the elderly, individuals with compromised immunity, and anyone with cardiac, respiratory, or other chronic conditions.

The vaccine is highly recommended for children with *asthma, congenital heart defects, diabetes, or renal problems*. In addition, we recommend it for kids with *recurrent ear or sinus infections*, and preschoolers in childcare or school-age children who live with high-risk individuals. In particular, infants and toddlers between 6 – 24 months of age are considered a relatively high-risk group; experts now recommend routine immunization for this age group. Flu shots are also recommended for pregnant women who are beyond 13 weeks gestation since pregnancy increases the risk of complications of influenza.

Influenza vaccine is made from a highly purified part of the viral surface. This is *not* a “live” virus vaccine. Kids younger than 9 years who are being immunized for the first time should receive 2 doses, 1 month apart, the first winter season, then 1 dose annually thereafter. Influenza vaccine comes in single-dose vials; it does not contain thimerosal or any other preservative. Like any immunization, flu shots may cause *fever, soreness*, or rarely, *allergic reactions*. **Fluzone is contraindicated in anyone with severe egg allergy.**

Influenza vaccine is also available as a nasal spray (“FluMist”) for healthy individuals from ages 5 through 49 years.

The word “flu” is commonly used generically to mean practically any common illness with fever. However, influenza viruses are only 1 type of literally hundreds of viruses and bacteria that cause human illness. Influenza vaccine therefore protects against influenza viruses only. It is *not* protective against any other types of infections like colds, stomach or intestinal viruses. In addition, it is unrelated to Hemophilus influenza type B (“HiB”) vaccine which is given to infants.

For more information on childhood vaccines go online to our website (listed below) and click on the links for immunizations.