Protecting your precious bundle.

Childhood Immunization Guide
A practical guide to helping your child grow up healthy through immunization.
Your baby is in good hands. Yours.

We know you’ve got your hands full, so we want to help you with one of the most important things you can do for your child: placing him or her on a regular immunization schedule.

What’s inside:

- How Immunity Works ................................................................. 3
- How Vaccines Help ................................................................... 3
- Diphtheria ................................................................................... 3
- Tetanus (Lockjaw) .................................................................... 4
- Pertussis (Whooping Cough) ................................................... 4
- DTaP Vaccine ............................................................................ 4
- Polio ............................................................................................. 6
- Measles ..................................................................................... 7
- Mumps ....................................................................................... 7
- Rubella (German Measles) ....................................................... 7
- MMR Vaccine ............................................................................ 8
- Haemophilus Influenzae Type B .............................................. 9
- Pneumococcal Disease ........................................................... 10
- Hepatitis B ................................................................................ 10
- Varicella (Chicken Pox) ........................................................... 12
- Hepatitis A ................................................................................ 13
- Frequently Asked Questions .................................................. 14
- Immunization Checklist .......................................................... 15
First things first.

This guide contains a recommended schedule for childhood immunizations based on advice from the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC), as well as other important information that you should know. For most plans, childhood immunizations are covered without a copayment. If you need help with postpartum care for yourself or your newborn, please contact your physician.

Why immunize?

None of us want to see our children sick. If we could, we would protect them from any illness, no matter how small—even the sniffles. Now suppose you could keep your child safe from some of the most deadly diseases in history. And at the same time help protect your neighbors’ children and other children around the country from the same diseases. And, finally, what if you could help rid the world of some of the diseases that have been crippling and killing children for centuries? You can do all of these things with one of the easiest and most powerful health tools ever developed—immunizations.

How immunity works.

Germs, such as the measles virus or whooping cough bacteria, enter your body and start to reproduce. Your immune system recognizes these germs as invaders from outside your body and responds by making proteins called antibodies. Antibodies have two jobs. The first is to help destroy the germs that are making you sick. Because the germs have a head start, you will already be sick by the time your immune system has produced enough antibodies to destroy them. But by eliminating the attacking germs, antibodies help you get well.

Antibodies remain in your bloodstream, guarding you against future infections. If the same germs ever try to infect you again—even after many years—these antibodies will come to your defense. Only now they can destroy the germs before they have a chance to make you sick. This process is called immunity. It is why most people get diseases like measles or chicken pox only once, even though they might be exposed many times during their lifetime.

How vaccines help.

The idea behind vaccination is to give you immunity to a disease before it has a chance to make you sick.

Vaccines are made from the same germs (or parts of them) that cause disease—the measles vaccine is made from the measles virus, for instance, and the Haemophilus influenzae type b (Hib) vaccine is made from parts of the Hib bacteria. But the germs in vaccines are either killed or weakened so they won’t make you sick.

Then the vaccines containing these weakened or killed germs are introduced into your body, usually by injection. Your immune system reacts to the vaccine the same way it would if it were being invaded by the disease—by making antibodies. The antibodies destroy the vaccine germs just as they would the disease germs. Then they stay in your body, giving you immunity.

If you are ever exposed to the real disease, the antibodies will be there to protect you. Immunizations help your child’s immune system do its work. Your child develops protection against future infections, the same as if he or she had been exposed to the natural disease. The good news is, with vaccines, your child doesn’t have to get sick first to get that protection.

Diphtheria

Diphtheria is a disease caused by bacteria called Corynebacterium diphtheria. These bacteria live in the mouth, throat and nose of an infected person, and are easily spread to others through coughing or sneezing. Some people with diphtheria might not even seem ill, but they can still spread the disease.

Two to four days after a child is exposed to diphtheria, he or she might get a sore throat, a slight fever and chills. If diphtheria is not properly diagnosed and treated, it can then produce a powerful toxin, which spreads throughout the body causing serious complications, such as heart failure or paralysis. Sometimes a thick membrane forms in a child’s throat, making it hard to swallow or even breathe. About one person out of every 10 who contracts diphtheria dies from it. A child with diphtheria is contagious for about two to four weeks.
**Tetanus (Lockjaw)**

Tetanus enters the body through cuts in the skin. It can get in through even a tiny pinprick or scratch, but it prefers deep puncture wounds or cuts, like those made by nails or knives. Children can also get tetanus following severe burns, ear infections, tooth infections or animal bites. Rusty nails are often blamed for causing tetanus, but it is the tetanus bacteria, and not rust, that cause the disease. You can get tetanus from a shiny nail as easily as from a rusty one.

Tetanus bacteria can live anywhere, but they are usually found in soil, dust and manure. Once they get into the body through a wound, it can take from three days to three weeks (usually about eight days) for the first symptoms to appear. These are usually a headache, crankiness and spasms of the jaw muscles.

Like diphtheria, tetanus can produce a toxin inside the body. As this toxin spreads, it causes muscle spasms in the neck, arms, legs and stomach. It can cause painful muscle contractions strong enough to break a child’s bones. Children with tetanus might have to spend several weeks in the hospital under intensive care. There are only about 50 cases of tetanus a year in the United States, but three out of every 10 people who get tetanus die from it.

**Pertussis (Whooping Cough)**

If you’ve ever seen a child with pertussis, you won’t forget it. The child coughs violently and rapidly, over and over, until the air is gone from his or her lungs and he/she is forced to inhale with the loud “whooping” sound that gives the disease its nickname, whooping cough. Then the coughing begins again. These severe coughing spells can go on for weeks. The child might turn blue from lack of air or vomit after a coughing spell. A child with whooping cough can have difficulty eating, drinking or even breathing.

Pertussis is a very contagious disease, and one that is fairly common in the United States, even today. It is caused by bacteria called Bordetella pertussis that live in the mouth, nose and throat. Pertussis is spread by personal contact, coughing and sneezing.

It usually takes a week to 10 days from the time a child is exposed until symptoms appear. At first pertussis looks like a common cold, with sneezing, runny nose, fever and a mild cough. But after one or two weeks, the severe coughing spells begin. This stage of the disease usually lasts one to six weeks, but can last longer.

After the coughing stage has passed, the child usually recovers gradually over two to three weeks. A child with pertussis can give the disease to another child from about a week after exposure until about three weeks after the severe coughing starts.

Pertussis is most severe in infants under one year old. More than half of the infants who get the disease must be hospitalized. Older children and adults can get pertussis too, but it is much less severe and might not even be recognized as pertussis. Many infants who contract pertussis catch it from their older brothers and sisters or from their parents.

Pertussis can cause serious complications. About one child in 10 with pertussis also gets pneumonia, and about one in every 50 will have convulsions. In one out of every 250 people who get pertussis, the brain is affected. This is called encephalopathy. Pertussis causes about 10 to 15 deaths a year in the United States.

The series of pertussis vaccinations children get protects them until they are about 10 years old. After that age, they may no longer be immune to pertussis. There is a booster shot available. All older children (10–12), parents, grandparents and caregivers should make sure they have received the DTaP (see below for more information).

**DTaP Vaccine**

**Vaccine for Diphtheria, Tetanus and Pertussis**

You can protect your children from diphtheria, tetanus and pertussis by getting them immunized with the DTaP vaccine. DTaP is actually three vaccines—diphtheria, tetanus and pertussis—combined into one shot.

DTaP is an updated version of the DTP vaccine. The “a” stands for acellular pertussis, which means that only part of the pertussis bacteria is used in the vaccine. The older DTP vaccine is now rarely used in the United States.

**A child needs five DTaP shots for maximum protection.**

The first three shots should be given at two, four and six months of age. The fourth (booster) shot is given between 15 and 18 months, and a fifth (booster) shot is given when the child is about to enter school, at four to six years of age. When the DTaP vaccine is given according to this schedule, it protects most children from all three diseases. If a child does get one of the diseases in spite of the vaccine, it will probably be milder than it would have been otherwise.
Side effects from DTaP immunization.

Up to one-third of children who get the DTaP vaccination have local reactions (tenderness, pain, redness and/or swelling) where the shot was given. These reactions are more likely after the fourth and fifth doses of DTaP than after the earlier doses, and may also be more pronounced. When they do occur, it is usually within two days after the shot is given. Some children also experience swelling of the entire leg or arm after the fourth or fifth DTaP dose. This happens within three days of the vaccination and usually lasts around four days, with no aftereffects.

Fever is another fairly common reaction. Approximately one in 20 children will get a fever of over 101°F, more often after the fourth or fifth dose. Up to one in five children will be fussy or lose his or her appetite for a day or two after the shot, and nearly half may be drowsy afterward.

Occasionally, a child will have a more serious side effect. About one child in 3,000 will get a fever of over 101°F, more often after the fourth or fifth dose. Up to one in five children will be fussy or lose his or her appetite for a day or two after the shot, and nearly half may be drowsy afterward.

Convulsions that occur after a DTaP shot are usually not caused directly by the vaccine but by a fever, which in turn was triggered by the vaccine. These are called “febrile seizures” and while they might be alarming when they occur, children recover from them quickly and they do not cause permanent harm. Some experts recommend giving a non-aspirin pain reliever (Tylenol® or other acetaminophen products) to reduce the chances of a fever, which should also make febrile seizures less likely. These pain relievers can be given at the same time as the shot and then every four to six hours over the next 24 hours.

Some people used to believe that DTaP shots could cause sudden infant death syndrome (SIDS), but studies have not shown a connection. Most experts, including the SIDS Alliance, agree that vaccinations do not cause SIDS. No deaths are known to have ever been caused by the DTP or DTaP vaccines.

Precautions

A child who has had convulsions or other nervous system problems in the past is slightly more likely than other children to have a serious reaction after DTaP, although the risk is still very small. There are several reasons a doctor might want to delay giving a child the DTaP vaccination or not give it at all:

- A child who had a severe allergic reaction after a dose of DTaP vaccine should not get another dose.
- A child who had encephalopathy (brain illness) within seven days after a dose of DTaP should not get another dose of the pertussis-containing vaccine.
- A child who had a temperature of 105°F within 48 hours after a dose of DTaP should probably not get another dose of the pertussis-containing vaccine.
- A child who cries continuously for three or more hours within 48 hours after a dose of DTaP should probably not get another dose of the pertussis-containing vaccine.
- A child who has convulsions within three days after a dose of DTaP should probably not get another dose of the pertussis-containing vaccine.
- A child who has convulsions or other nervous system problems in the past is slightly more likely than other children to have a serious reaction after DTaP, although the risk is still very small. There are several reasons a doctor might want to delay giving a child the DTaP vaccination or not give it at all:
- A child who had a severe allergic reaction after a dose of DTaP vaccine should not get another dose.
- A child who had encephalopathy (brain illness) within seven days after a dose of DTaP should not get another dose of the pertussis-containing vaccine.
- A child who had a temperature of 105°F within 48 hours after a dose of DTaP should probably not get another dose of the pertussis-containing vaccine.
- A child who cries continuously for three or more hours within 48 hours after a dose of DTaP should probably not get another dose of the pertussis-containing vaccine.
- A child who has convulsions within three days after a dose of DTaP should probably not get another dose of the pertussis-containing vaccine.
- A child who has convulsions or other nervous system problems in the past is slightly more likely than other children to have a serious reaction after DTaP, although the risk is still very small. There are several reasons a doctor might want to delay giving a child the DTaP vaccination or not give it at all:
- A child who had a severe allergic reaction after a dose of DTaP vaccine should not get another dose.
- A child who had encephalopathy (brain illness) within seven days after a dose of DTaP should not get another dose of the pertussis-containing vaccine.
- A child who had a temperature of 105°F within 48 hours after a dose of DTaP should probably not get another dose of the pertussis-containing vaccine.
- A child who cries continuously for three or more hours within 48 hours after a dose of DTaP should probably not get another dose of the pertussis-containing vaccine.
- A child who has convulsions within three days after a dose of DTaP should probably not get another dose of the pertussis-containing vaccine.
- A child who has a moderate or severe illness on the day a DTaP (or any) vaccination is scheduled should probably delay the vaccination until he or she has recovered.

Note: Children who should not get a pertussis-containing vaccine can get the DT (diphtheria/tetanus) vaccine instead of DTaP. Your child’s doctor can give you more details.

After getting the DTaP vaccine.

If your child has any serious or unusual problem after getting DTaP or any other vaccine, call your child’s doctor or bring your child to a doctor right away.
Polio

Even though there is no polio in the United States—or, in fact, in the Western hemisphere—it is still common in some parts of the world. A single infection brought into the country by someone traveling from one of these regions could lead to a polio epidemic all over again if we were not protected. That is why polio vaccinations are still given.

Polio is caused by a virus that lives in the throat and intestinal tract. It is spread through contact with the bowel movements of an infected person (for instance, by changing diapers).

Some children who get polio don’t feel ill at all. For others, polio simply feels like a cold, with symptoms appearing about six to 20 days after exposure. Sometimes these children will also feel some pain and stiffness in their neck, back and legs, but this soon goes away.

However, some children who get polio become paralyzed and lose the use of their muscles. This is called paralytic polio. Paralytic polio can start like a common cold, but often with severe muscle pain. Paralysis usually comes within the first week. Most often, it affects the child’s legs, but sometimes it affects other muscles, including those that control breathing. Some children recover from their paralysis, but many will be permanently disabled. There is no treatment for polio, and some children die from it.

Polio is most contagious from about seven to 10 days before symptoms appear until about seven to 10 days afterward.

There are two types of polio vaccine: inactivated (killed) polio vaccine (IPV), which is a shot; and live oral polio vaccine (OPV), which is a liquid that is swallowed.

The Centers for Disease Control and Prevention (CDC) recommends only IPV, except in very limited circumstances. Children should get four doses of IPV. Four doses of the polio vaccine will protect most children for life. However, for certain people—for instance, those traveling to countries where polio is still common—a booster dose is recommended.

Side effects from the polio immunization.

Inactivated polio vaccine is a very safe vaccine. It is not known to produce any side effects other than a little soreness and redness where the shot is given. Like any vaccine or medicine, IPV could theoretically trigger a serious reaction in someone who is allergic to one of its components. But severe allergic reactions to childhood vaccines are very rare (estimated at around one per million doses), and no child is known to have ever died from an allergic reaction to a vaccine.

Precautions

There are several reasons a doctor might want to delay giving a child an IPV vaccination, or not give it at all:

- A child who is known to have a severe allergy to the antibiotics neomycin, streptomycin or polymyxin B should not get IPV.
- A child who has had a severe allergic reaction after a dose of IPV should not get another dose.
- A child who has a moderate or severe illness on the day an IPV (or any) vaccination is scheduled should probably delay the vaccination until he or she has recovered.

Your child’s doctor can provide you with more details.

After getting the polio vaccine.

If a child has any serious or unusual problem after getting the polio vaccine, or any other vaccine, call a doctor or bring your child to a doctor right away.

Polio Vaccine Schedule

<table>
<thead>
<tr>
<th>Dose</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Dose</td>
<td>2 months</td>
</tr>
<tr>
<td>Second Dose</td>
<td>4 months</td>
</tr>
<tr>
<td>Third Dose</td>
<td>6–18 months</td>
</tr>
<tr>
<td>Fourth Dose (booster)</td>
<td>4–6 years</td>
</tr>
</tbody>
</table>
**Measles**

For most children, measles means a rash and a cold, and missing a few days of school. But about one out of every 10 children who gets measles will also get an ear infection. And up to one out of 20 of them gets pneumonia. About one child in every 1,000 who gets measles will get encephalitis. Encephalitis is an inflammation of the brain that can lead to convulsions and can leave your child deaf or with permanent brain damage. Out of every 1,000 children who get measles, one or two die from it.

Measles is caused by a virus. It spreads so easily that any child who is exposed to it who is not immune will probably get it. You can get measles from an infected person who coughs or sneezes around you or even talks to you. The first signs of measles are a fever, runny nose and cough, which appear about 10 to 12 days after a child is exposed. The rash appears several days later. A child with measles is contagious from about four days before the rash appears to about four days after.

But even though the number of measles cases each year is only a fraction of what it used to be, this doesn’t mean that your children cannot get measles. In 1989 and 1990, there was a large jump in measles cases and deaths, partly because many parents weren’t getting their preschool-aged children vaccinated. In response to this outbreak, doctors and health departments stepped up their efforts to vaccinate children, and measles cases have since dropped to all-time low levels.

The measles vaccine used today is a live, attenuated vaccine. In other words, the virus that is used to make the vaccine is not killed, but it is weakened so that it doesn’t cause measles.

**Mumps**

Before vaccines, mumps was a common childhood disease. The most obvious sign of mumps is swelling of the cheeks and jaw, which is caused by inflammation in the salivary glands. Children with mumps usually also get a fever and headache. Generally, mumps is a mild disease, but it does have its serious side:

- Occasionally, mumps also causes encephalitis. Usually the child recovers without permanent damage.
- Approximately one out of every four teenage or adult men who gets mumps develops a painful swelling of the testicles.
- Although it is rare, mumps can cause deafness (about one in 20,000 cases) or death (about one in 10,000 cases).

Children get mumps through contact with others who are already infected with the mumps virus. The virus is spread through the air by coughing, sneezing or simply talking. Children start to show signs of mumps two to three weeks after they are exposed. They are contagious from about 12 to 24 days after exposure.

**Rubella (German Measles)**

When children get rubella, it is usually a mild disease with a slight fever that lasts for about 24 hours, and a rash on the face and neck that lasts two or three days. Rubella is also called German measles or three-day measles. It is caused by the rubella virus and usually strikes in the winter and spring. It is spread through close contact, such as coughing, sneezing or talking. Most children recover quickly and completely.

But the greatest danger from rubella is not to children or adults, but to unborn babies. If a woman gets rubella in the early months of her pregnancy, there is an 80 percent chance that her baby will be born with birth defects. This is called congenital rubella syndrome (CRS). Babies with CRS may be born deaf or blind. They may have damaged hearts or small brains. Many have permanent brain damage. Miscarriages are also common among women who get rubella while they are pregnant.

It takes about 12 to 23 days from the time of exposure for people to start showing signs of the disease. Rubella is most contagious while the rash is visible, but it can be spread from about a week before the rash starts until about a week after.
**MMR Vaccine**

**Vaccine for Measles, Mumps and Rubella**

Most children get measles, mumps and rubella vaccines all together in one shot called MMR. All three of these vaccines work very well, and will protect most children for the rest of their lives.

Children should get two doses of the MMR vaccine. The first is given between 12 and 15 months of age. The second may be given at any time, as long as it is at least 28 days after the first. It is usually given at four to six years of age, before the child enters kindergarten or first grade.

Measles, mumps and rubella vaccines can be given separately, too. But this is not usually done because it means giving a child three shots instead of one. Sometimes, usually during a measles outbreak, children might be given measles or the MMR vaccine before their first birthday. This is for short-term protection only. These children should still be given two doses of the MMR vaccine at the usual ages.

**MMR Vaccine Schedule**

<table>
<thead>
<tr>
<th>Dose</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Dose</td>
<td>12–15 months</td>
</tr>
<tr>
<td>Second Dose</td>
<td>4–6 years</td>
</tr>
</tbody>
</table>

**Side effects from MMR immunization.**

**Measles**

About one child in five will get a mild rash or fever beginning a week or two after vaccination. These reactions last for a few days.

**Mumps**

Very few children suffer any ill effects from the mumps vaccine. Occasionally a child will get a mild fever one or two weeks after vaccination or swollen glands in the cheeks or under the jaw. More serious reactions are extremely rare.

**Rubella**

About one child out of seven will get a rash or swelling in the lymph glands after getting rubella vaccine. This usually happens within a week or two after the shot and lasts one or two days. Also, about one child out of 100 will have some pain or stiffness in the joints, which can last from a few days to a few weeks.

There is a small chance (less than one in 100) that a child will have painful swelling of the joints (arthritis) after getting the rubella vaccine. This usually lasts only a few days, but it can last longer, and can come and go. These joint problems occur more often in adults, especially women.

Febrile seizures (seizures caused by a fever) have occasionally been reported among children who have gotten the MMR vaccine. They usually happen one or two weeks after the shot and are caused by the fever that can accompany vaccination rather than the vaccine itself. Children recover from febrile seizures quickly, and they do not cause permanent harm.

There have been reports of children getting encephalitis after an MMR shot. This happens so rarely—less than once in a million shots—that experts are not sure whether the MMR vaccine causes this problem or whether it simply happens by chance.

Remember, though, that if the same million children got measles, about 1,000 of them would get encephalitis, 6,000 to 7,000 would have convulsions, and 700 would die; statistically speaking, the benefits of the MMR vaccine greatly outweigh the slight risk.

MMR, like any vaccine or medicine, could trigger a severe allergic reaction in a child who is allergic to one of the vaccine’s components. But severe allergic reactions to childhood vaccines are very rare (estimated at around one per million doses), and no child is known to have ever died from an allergic reaction to a vaccine.

**Precautions**

There are several reasons a doctor might want to delay giving a child an MMR vaccination or not give it at all:

- A child who is known to have a severe allergy to gelatin or the antibiotic neomycin should not get MMR.
- A child who has had a severe allergic reaction after a dose of MMR should not get another dose.
- A child whose immune system is suppressed (because of a disease such as cancer or HIV infection or medication such as steroids) should be evaluated by a doctor before getting the MMR vaccine.
- A child who has recently received a transfusion or other blood product might have to wait up to several months before getting MMR.
- A child who has a moderate or severe illness on the day an MMR (or any) vaccination is scheduled should probably delay the vaccination until he or she has recovered.

**After getting the MMR vaccine.**

If your child has any serious or unusual problem after getting this vaccine, call a doctor or bring your child to a doctor right away.
Haemophilus Influenzae Type B (Hib)

Hib is a bacterial disease. It is spread through the air by coughing, sneezing or even breathing. Hib bacteria enter a child’s system through the nose or throat, and if they stay in the nose and throat, the child will probably not become sick. But sometimes the bacteria spreads into the lungs or bloodstream. This is called invasive Hib disease, and it can cause serious complications. In addition to meningitis, invasive Hib disease can lead to:

- Pneumonia
- Epiglottitis (inflammation and swelling in the throat that can cause the child to choke)
- Arthritis, and other problems

Most invasive Hib outbreaks occur in children under five years old, and up to 60 percent in children younger than one year. The disease is not common in older children or adults. Most Hib outbreaks today strike infants who are not immunized.

It probably takes about two to four days from the time a child is exposed to Hib bacteria until symptoms appear. An infected person can spread the disease to others for as long as the bacteria remain in the body. Antibiotics can stop the spread within two to four days.

The Hib vaccine is an inactivated (killed) vaccine. It is made from only a part of the Hib bacteria. Several different companies make the Hib vaccine. **Children should get either three or four doses, depending on which company’s vaccine your doctor is using.** All children should get the vaccine at two and four months of age, and a booster dose between 12 and 15 months. Some children should get an additional dose at six months. Children who have passed their fifth birthday do not need a Hib vaccination.

Hib vaccine can be combined (given in the same shot) with the DTaP vaccine or with the hepatitis B vaccine. Your child’s doctor or nurse might offer the vaccines in these combination forms.

**Side effects from Hib immunization.**

Hib is a very safe vaccine. It cannot cause Hib disease or meningitis, and is not known to cause any other serious reactions. About two children in every 100 who get the Hib vaccine get some redness, swelling or warmth where the shot was given, or a fever of over 101°F. These reactions usually begin within 24 hours after the shot is given and last up to two or three days. They do not cause any permanent harm.

Like any vaccine or medicine, the Hib vaccine could theoretically trigger a serious reaction in someone who is allergic to one of its components. But severe allergic reactions to childhood vaccines are very rare (estimated at around one per million doses), and no child is known to have ever died from an allergic reaction to a vaccine.

**Precautions**

There are several reasons a doctor might want to delay giving a child a Hib vaccination or not give it at all:

- A child who has had a severe allergic reaction after a dose of the Hib vaccine should not get another dose.
- A child who has a moderate or severe illness on the day a Hib (or any) vaccination is scheduled should probably delay the vaccination until he or she has recovered.
- Children under four weeks of age should not get the Hib vaccine. This isn’t because it is unsafe, but because the vaccine might not protect as well when the first dose is given too early.

**After getting the Hib vaccine.**

If your child has any serious or unusual problem after getting the Hib vaccine, or any other vaccine, call a doctor or bring your child to a doctor right away.

<table>
<thead>
<tr>
<th>Dose</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Dose</td>
<td>2 months</td>
</tr>
<tr>
<td>Second Dose</td>
<td>4 months</td>
</tr>
<tr>
<td>Third Dose (booster)</td>
<td>12–15 months</td>
</tr>
</tbody>
</table>
Pneumococcal Disease

The Streptococcus pneumoniae bacteria kills more people in the United States each year than all other vaccine-preventable diseases combined. It is commonly thought of as a disease of the elderly, but it also takes its toll among children. Each year, the pneumococcal bacteria cause invasive disease (mostly blood infection, or bacteremia) in about 16,500 children under five years old, including more than 700 cases of meningitis. It is the leading cause of bacterial meningitis in the country, hitting children under one year of age the hardest. About 200 children die from invasive pneumococcal disease each year.

In addition, pneumococcal disease (pneumonia) causes 25 to 40 percent of all middle ear infections in children. Middle ear infections are responsible for more visits to a pediatrician than any other complaint, and they are the number one reason for prescribing antibiotics to children.

All children are susceptible to pneumococcal disease, but some groups have higher rates of the disease, including African Americans, American Indians, Alaskan Natives, and children with certain medical conditions such as sickle cell disease or HIV infection, or those who don’t have a functioning spleen.

The pneumococcal bacteria are spread from person to person, mainly through the air. The disease can be spread by anyone who is infected, even if they don’t have symptoms. Pneumococcal infections are more common during the winter and early spring.

Treating pneumococcal infections with penicillin and other antibiotics used to be effective, but the disease is becoming more and more resistant to antibiotic treatment, making immunization increasingly important.

The pneumococcal conjugate (Prevnar) vaccine is an inactivated (killed) vaccine. It provides immunity against the seven strains of the pneumococcal bacterium that cause most of the serious infections in children. This vaccine should prevent most meningitis and bacteremia caused by pneumococcal bacteria. However, there are other causes of bacteremia and meningitis, and this vaccine will not prevent them. It also will not prevent all ear infections. Some ear infections are caused by pneumococcal disease, but many are caused by other germs too, and the vaccine will not prevent these.

Hepatitis B

Hepatitis B is a disease that affects the liver. It is one of several hepatitis diseases (for example, hepatitis A and hepatitis C). These are caused by different germs, but are similar in that they all affect the liver.

Hepatitis B is caused by a virus. Some people who are infected with the hepatitis B virus never feel sick. Others have symptoms that might last for several weeks. Those symptoms can include:

• Loss of appetite and tiredness
• Pain in muscles, joints or stomach
• Diarrhea or vomiting
• Yellow skin or eyes (jaundice)

This is called acute hepatitis B. Some people never recover from hepatitis B. They develop what is called chronic (long-term) hepatitis B virus infection. They might not look or feel sick, but they will probably carry the hepatitis B virus in their blood for the rest of their lives, and they can infect other people.

Many of these chronically infected people will suffer from serious health problems, such as cirrhosis (scarring of the liver) or liver cancer. In fact, the hepatitis B virus causes most of the liver cancer in the world. In the United States, there are more than one million people chronically infected with the hepatitis B virus.

The hepatitis B virus is spread through contact with the blood or other body fluids of an infected person. People can get hepatitis B by having unprotected sex, by sharing drug needles, or by sharing personal items like razors or toothbrushes with someone who is infected. Doctors, nurses and other health care workers can get hepatitis B through exposure to blood from infected patients. Police, firefighters and paramedics who are exposed to blood are also at risk.

Why then do we immunize children against hepatitis B when they don’t have sex, don’t take drugs and are not nurses or police officers? One important reason is that babies can get infected. If a mother is chronically infected with hepatitis B, her baby could become infected during birth. If these babies are not immunized immediately, most of them will become chronically infected too. One out of four of these babies will eventually die from cirrhosis or liver cancer. Also, children can be infected through exposure to blood, saliva, or other fluids from infected children or adults. While this is not common, vaccination is a reasonable precaution, particularly since the vaccine is a very safe one.
You can help protect your children from hepatitis B by getting them vaccinated with three doses of the hepatitis B vaccine. Newborn babies whose mothers are either infected with the hepatitis B virus or have not been tested should get their first shot within 12 hours of birth, the second shot at one to two months of age and the third shot at six months of age. Other babies can get their first shot between birth and two months of age, the second at one to four months of age and the third at six to 18 months of age.

Note: Babies born to infected mothers should also get hepatitis B immune globulin (HBIG) within 12 hours of birth. Your child’s doctor can give you details. These babies should also be checked when they are nine to 15 months old to make sure the vaccine worked and that they do not have chronic hepatitis B virus infection.

The second shot should always be given at least one month after the first shot, and the third shot at least two months after the second and four months after the first. Your doctor will tell you the best time to get these shots. If you miss a dose or get behind schedule, there is no need to start over. Just get the next dose as soon as possible and continue on schedule. After the third shot, most children will be protected. They do not need booster shots.

### Side effects from hepatitis B immunization.

The hepatitis B vaccine is very safe. Some children (about three to nine out of 100) have some soreness where the shot is given, and up to about six in 100 will get a mild fever. Up to two out of 10 children might become tired or irritable.

More serious reactions are extremely rare. Like any vaccine or medicine, hepatitis B vaccine could theoretically trigger a serious reaction in someone who is allergic to one of its components. But severe allergic reactions to childhood vaccines are very rare (estimated at around one per million doses), and no child is known to have ever died from an allergic reaction to a vaccine.

### Precautions

There are several reasons a doctor might want to delay giving a child a hepatitis B vaccination or not give it at all:

- A child who is known to have a severe allergy to baker’s yeast (the kind used for making bread) should not get the hepatitis B vaccine.
- A child who had a severe allergic reaction after a dose of the hepatitis B vaccine should not get another dose.
- A child who has a moderate or severe illness on the day a hepatitis B (or any) vaccination is scheduled should probably delay the vaccination until he or she has recovered.

### After getting the hepatitis B vaccine.

If your child has any serious or unusual problem after getting this vaccine, call a doctor or bring your child to a doctor right away.

### Hepatitis B Vaccine Schedule

<table>
<thead>
<tr>
<th>Dose</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Dose</td>
<td>0–2 months</td>
</tr>
<tr>
<td>Second Dose</td>
<td>1–4 months</td>
</tr>
<tr>
<td>Third Dose</td>
<td>6–18 months</td>
</tr>
</tbody>
</table>
Varicella (Chicken Pox)

The most recognizable feature of chicken pox is an itchy rash all over the body. Children with chicken pox can also be drowsy and have a fever.

Chicken pox can be spread very easily from person to person. It is spread through the air, by coughing or sneezing, or even talking. It can also be spread by contact with fluid from the blisters. It usually takes two to three weeks from the time a child is exposed to the chicken pox virus until he or she becomes ill. The disease is contagious from one or two days before the rash appears until all the blisters are dried up, which usually takes four to five days.

Chicken pox is usually a mild disease, uncomfortable but not dangerous. Still, serious problems do occur. The blisters can become infected, and some children get encephalitis. Of every 100,000 infants under one year of age who get chicken pox, about four die. For older children, one to 14 years old, about one child in 100,000 dies. If a woman gets chicken pox just before or after giving birth, her baby can get very sick, and about one in three of these children dies if not treated quickly.

A single dose of the varicella vaccine is recommended for children between 12 and 15 months of age. It is usually given at the same time as the MMR shot. Children who miss this shot can still get a single dose of the vaccine up to their 13th birthday. Adolescents or adults who haven’t gotten the vaccine by their 13th birthday will need two doses, four to eight weeks apart. A child who has already had chicken pox disease does not need to get the shot.

Varicella Vaccine Schedule

<table>
<thead>
<tr>
<th>Dose</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Dose (babies and children)</td>
<td>12–15 months</td>
</tr>
<tr>
<td>Second Dose (babies and children)</td>
<td>4–6 years</td>
</tr>
<tr>
<td>First Dose (children and adolescents age 13+ years, if missed at age 12–15 months)</td>
<td>&lt;13 years</td>
</tr>
<tr>
<td>Second Dose (children and adolescents age 13+ years, if missed at age 12–15 months)</td>
<td>&lt;13 years; 4–8 weeks after first dose</td>
</tr>
</tbody>
</table>

There is some concern that a child who gets the chicken pox vaccine can actually give chicken pox to other, unprotected family members. This appears to happen extremely rarely, and only when the child who was vaccinated develops a rash. To be safe, anyone with a suppressed immune system should consider avoiding contact with a child who develops a rash after getting the chicken pox vaccination, just as they should avoid anyone who has a case of chicken pox.

Side effects from varicella immunization.

The varicella vaccine is very safe. Some children (about one out of five) get red or sore where the shot was given. Some children also get a mild rash (about five spots) about one to three weeks after the shot. Febrile seizures have occurred in less than one out of 1,000 children; other serious problems such as inflammation of the brain or loss of muscle coordination have been reported very rarely. These problems happen so rarely that experts cannot tell whether or not they are caused by the vaccine, or just happen at the same time by chance. Like any vaccine or medicine, the varicella vaccine could theoretically trigger a serious reaction in someone who is allergic to one of its components. But severe allergic reactions to childhood vaccines are very rare (estimated at around one per million doses), and no child is known to have ever died from an allergic reaction to a vaccine.

Precautions

There are several reasons a doctor might want to delay giving a child a varicella vaccination or not give it at all:

- A child who is known to have a severe allergy to gelatin or the antibiotic neomycin should not get the varicella vaccine.
- A child who had a severe allergic reaction after a dose of the varicella vaccine should not get another dose.
- A child with a suppressed immune system (because of a disease such as cancer or HIV infection, or medication such as steroids) should be evaluated by a doctor first.
- A child who has recently received a transfusion or other blood product might have to wait several months before getting the varicella vaccine.
- A child who has a moderate or severe illness on the day a varicella (or any) vaccination is scheduled should probably delay the vaccination until he or she has recovered.

After getting the varicella vaccine.

If your child has any serious or unusual problem after getting this vaccine, call a doctor or bring your child to a doctor right away.
Hepatitis A

Hepatitis A, like other types of hepatitis, is a disease that affects the liver. There are an estimated 125,000 to 200,000 cases in the United States each year. About three cases out of 10 occur in children under 15 years old.

Hepatitis A is caused by a virus. Children under six years old who get infected often don’t show any signs of illness. But for most older children, signs of hepatitis can come on quickly. They include:

- Fever
- Loss of appetite and tiredness
- Stomach pain
- Vomiting
- Dark urine
- Yellow skin or eyes (jaundice)

Hepatitis A can’t be distinguished from other types of hepatitis except by blood testing. Hepatitis A does not cause long-term illness or liver damage like hepatitis B does. But every year, about 100 people die from liver failure caused by severe hepatitis A.

The hepatitis A virus is found mainly in bowel movements and is spread through personal contact or by eating contaminated food or drinking contaminated water. For almost half the cases in the United States, the source of the infection is not known. An infected person can spread the virus to other people from about a week before symptoms appear through about a week after. People without symptoms can still spread the disease.

The hepatitis A vaccine is an inactivated (killed) vaccine. It can be given to children 12 months of age. Two doses are needed, the second dose given six months after the first.

### Hepatitis A Vaccine Schedule

<table>
<thead>
<tr>
<th>Dose</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Dose</td>
<td>12 months</td>
</tr>
<tr>
<td>Second Dose</td>
<td>18 months</td>
</tr>
</tbody>
</table>

The hepatitis A vaccine is recommended for children in certain states (Alaska, Arizona, California, Idaho, Nevada, New Mexico, Oklahoma, Oregon, South Dakota, Utah and Washington), and may also be considered for children in Arkansas, Colorado, Missouri, Montana, Texas and Wyoming.

The vaccine is recommended for communities with high levels of hepatitis A, including Alaskan Native villages, American Indian reservations, some Hispanic communities, and some religious communities. It is also recommended for others who are at high risk, including people traveling to countries where the disease is common.

### Side effects from hepatitis A immunization.

The hepatitis A vaccine is very safe. Mild local reactions, like pain or swelling where the shot is given, are reported in up to half of people who get it. Less than one person out of 10 reports fatigue or a mild fever. No serious reactions have been reported.

Like any vaccine or medicine, hepatitis A vaccine could theoretically trigger a serious reaction in someone who is allergic to one of its components. But severe allergic reactions to childhood vaccines are very rare (estimated at around one per million doses), and no child is known to have ever died from an allergic reaction to a vaccine.

### Precautions

- A child who is known to have a severe allergy to alum should not get the hepatitis A vaccine.
- A child who had a severe allergic reaction after the first dose of the hepatitis A vaccine should not get the second dose.
- A child who has a moderate or severe illness on the day a hepatitis A (or any) vaccination is scheduled should probably delay the vaccination until he or she has recovered.

### After getting the hepatitis A vaccine.

If your child has any serious or unusual problems after getting this vaccine, call your child’s doctor or bring him/her to a doctor immediately.

### Additional Vaccines

The Rotavirus can cause severe watery diarrhea, vomiting, fever, and abdominal pain. Children who get Rotavirus disease can become dehydrated and may need to be hospitalized. According to the Centers for Disease Control and Prevention, Rotavirus vaccines are very effective at preventing rotavirus disease and children should get either of the two available vaccines:

### Rotavirus Vaccine Schedule

<table>
<thead>
<tr>
<th>Dose</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotarix® (RV1) is given in 2 doses</td>
<td>2 months and 4 months</td>
</tr>
<tr>
<td>RotaTeq® (RV5) is given in 3 doses</td>
<td>2 months, 4 months, and 6 months</td>
</tr>
</tbody>
</table>

The flu and Meningococcal vaccines are also now recommended for all children. For more information on the Rotavirus, flu, Meningococcal and other vaccines, visit cdc.gov/vaccines.
Frequently Asked Questions

1. How many vaccinations does my child need and when?
Some children should get their first shot (hepatitis B) before leaving the hospital after birth; others begin at two months of age. You will have to return to your child’s doctor for additional vaccinations several times before your child starts school. Be sure to ask your child’s doctor or nurse when you need to come back.

2. Why do children need so many vaccinations?
There are several potentially serious diseases that vaccines protect against: measles, mumps, rubella (German measles), diphtheria, tetanus (lockjaw), pertussis (whooping cough), polio, Haemophilus influenzae type b (Hib disease), hepatitis B, varicella (chicken pox), hepatitis A, Rotavirus, Meningococcal and pneumococcal disease. At least one dose is needed for each of these diseases, and for some of them, several doses are required for the best protection. This adds up to a lot of shots, and several are usually given at the same time. Some parents worry that it is not safe to give several shots at once. But vaccinations have been demonstrated to be just as safe and effective when given together as they are when given separately. The immune system is exposed to many foreign substances every day and is not likely to be overburdened by vaccines. Several combination vaccines already exist (such as MMR and DTaP) in which multiple vaccines are given in a single shot, and this reduces the number of shots needed.

3. Why are vaccines given at such an early age?
Vaccines are given at an early age because the diseases they prevent can strike at an early age. Some diseases are far more serious or common among infants or young children. For example, up to 60 percent of severe diseases caused by Haemophilus influenzae type b occur in children under 12 months of age. Infants less than six months of age are at highest risk for serious complications of pertussis (whooping cough); 72 percent of children under six months who get pertussis must be hospitalized, and 84 percent of all deaths from pertussis are among children under six months. The ages at which vaccines are recommended are not arbitrary. They are chosen to give children the earliest and best protection against disease.

4. How serious are these diseases?
Any of them can kill a child. It’s easy to forget how serious they are because — thanks largely to vaccines — we don’t see them nearly as much as we used to. Measles used to take the lives of thousands of people in the United States every year. In the 1940s and 1950s, tens of thousands of children were crippled or killed by polio. As recently as the mid-1980s, 20,000 children a year suffered from meningitis and other serious complications as a result of Hib disease. These diseases aren’t as common as they used to be, but they haven’t changed. They can still lead to pneumonia, choking, brain damage, heart problems, liver cancer and blindness in children who are not immune. And, they still take the lives of children every year, even in the United States.

5. What could happen if my child doesn’t get these vaccinations?
One of two things could happen:
1. If your child goes through life without ever being exposed to any of these diseases, nothing would happen.
2. If your child were exposed to any of these diseases, there is a good chance he or she could become mildly ill and have to stay inside for a few days, or get very sick and have to go to the hospital. At the very worst, the disease could be fatal. In addition, he or she could also spread the disease to other children and adults who are not immune. If there were enough unprotected people in your community, the result could be an epidemic, with many people getting sick and some dying.

6. What are my child’s chances of being exposed to these diseases?
Some of these diseases are very rare in the United States today, but common elsewhere in the world. Don’t assume your child is completely safe from these diseases, even the rare ones.

7. Are vaccinations safe?
Yes, immunizations are very safe, but they are not perfect. Like any other medicine, they can occasionally cause reactions. Usually these are mild, like a sore arm or a slight fever. Serious reactions are rare, but they can happen. Your child’s doctor or nurse can discuss the risks with you before your child receives his/her immunizations. The important thing to remember is that contracting the diseases is likely to be much more dangerous than getting the shots.

8. Do vaccinations always work?
Most childhood immunizations give immunity to 90–99 percent of the children who receive them. But occasionally a child won’t respond to certain vaccines. This is another reason why it’s important for all children to be vaccinated. A child who has not responded to a vaccination has to depend on the immunity of others around him or her for protection. He or she could be infected by a child who hasn’t been vaccinated, but not by one who is immune.

9. What if my child didn’t start the vaccinations on time, or gets behind schedule? Will they still work?
Yes. Most of these immunizations can be given at almost any age, and a child who has fallen behind does not have to start over. The shots already given will still count, and your child will still develop immunity. Just contact your child’s doctor; the sooner that you can get your child on track, the better.
10. Are vaccinations expensive?¹
No. As long as your child’s physician is part of the Oxford network of participating physicians, your Oxford plan from UnitedHealthcare fully covers your immunizations in accordance with the requirements of the Patient Protection and Affordable Care Act (ACA).

If you still have questions, please discuss them with your child’s doctor.

Prevention is the best medicine.
The information contained in this booklet is based upon recommendations from the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC).

Immunization Checklist

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>Age</th>
<th>Age (booster)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polio (IPV)</td>
<td>2 months</td>
<td>Between 6 and 18 months</td>
</tr>
<tr>
<td></td>
<td>4 months</td>
<td>Between 4 and 6 years</td>
</tr>
<tr>
<td>Diphtheria, Tetanus, Pertussis (DTP/DTaP)</td>
<td>2 months</td>
<td>Between 15 and 18 months</td>
</tr>
<tr>
<td></td>
<td>4 months</td>
<td>Between 4 and 6 years</td>
</tr>
<tr>
<td></td>
<td>6 months</td>
<td></td>
</tr>
<tr>
<td>Haemophilus Influenza Type B (Hib)</td>
<td>2 months</td>
<td>6 months old</td>
</tr>
<tr>
<td></td>
<td>4 months</td>
<td>Between 12 and 15 months</td>
</tr>
<tr>
<td>Heptavalent Pneumococcal Conjugate (Prevnar)</td>
<td>2 months</td>
<td>6 months old</td>
</tr>
<tr>
<td></td>
<td>4 months</td>
<td>Between 12 and 15 months</td>
</tr>
<tr>
<td>Rotavirus Rotarix® (RV1) is given in 2 doses at ages 2 months and 4 months. RotaTeq® (RV5) is given in 3 doses at ages 2 months, 4 months, and 6 months.</td>
<td>2 months</td>
<td>6 months old</td>
</tr>
<tr>
<td></td>
<td>4 months</td>
<td></td>
</tr>
<tr>
<td>Hepatitis B (Hep-B)</td>
<td>Between 0 and 2 months</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between 1 and 4 months</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between 6 and 18 months</td>
<td></td>
</tr>
<tr>
<td>Measles, Mumps, Rubella (MMR)</td>
<td>Between 12 and 15 months</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between 4 and 6 years</td>
<td></td>
</tr>
<tr>
<td>Varicella—Chicken Pox</td>
<td>Between 12 and 15 months</td>
<td></td>
</tr>
<tr>
<td>Influenza</td>
<td>6 months and older</td>
<td></td>
</tr>
<tr>
<td>Hepatitis A (Hep-A)</td>
<td>12 months old</td>
<td>6 months after initial dose</td>
</tr>
<tr>
<td>Meningococcal</td>
<td>Between 9 and 23 months. Talk to your child’s doctor for more information.</td>
<td></td>
</tr>
</tbody>
</table>
Certain preventive care services, including immunizations, are provided as specified by the Patient Protection and Affordable Care Act (ACA), with no cost-sharing to you. These services are based on your age, gender and other health factors. Oxford also covers other routine services that may require a copay, coinsurance or a deductible. If additional services are rendered during your office visit, a copayment may apply. Some plans may require copayments, deductibles and/or coinsurance for these benefits. Always review to your plan documents, including your Certificate of Coverage and/or Summary of Benefits for more information about your specific coverage. This information should only be used as an educational tool and is not intended to replace the advice of a doctor or other health care professional. You should talk with your doctor or your child’s doctor before making any health care decisions.

To learn more about specific vaccine concerns or recommendations, please contact your doctor, or visit the Centers for Disease Control and Prevention (CDC) website at cdc.gov/vaccines. Call 1-800-232-4636 for more information.

1 Certain preventive care services, including immunizations, are provided as specified by the Patient Protection and Affordable Care Act (ACA), with no cost-sharing to you. These services are based on your age, gender and other health factors. Oxford also covers other routine services that may require a copay, coinsurance or a deductible. If additional services are rendered during your office visit, a copayment may apply. Some plans may require copayments, deductibles and/or coinsurance for these benefits. Always review to your plan documents, including your Certificate of Coverage and/or Summary of Benefits for more information about your specific coverage. This information should only be used as an educational tool and is not intended to replace the advice of a doctor or other health care professional. You should talk with your doctor or your child’s doctor before making any health care decisions.

2 https://www.cdc.gov/rotavirus/vaccination.html

Oxford insurance products are underwritten by Oxford Health Insurance, Inc. Oxford HMO products are underwritten by Oxford Health Plans (NJ), Inc. and Oxford Health Plans (CT), Inc. Administrative services provided by Oxford Health Plans LLC.