

Why Immunize?

None of us wants to see our children get sick. If we could, we would protect them from any illness, no matter how small - even the sniffles.

Now suppose you could make your child safe from some of the most deadly diseases in history.

And suppose that at the same time you could also help protect your neighbors' children and other children around the country from the same diseases.

And finally, suppose you could actually help to rid the world of some of these diseases that have been crippling and killing children for centuries.

You **can** do all of these things — with one of the easiest, and yet most powerful, health tools ever developed. You can make sure your children get their shots.

Vaccines are an amazing success story.

- Up through the early 1920's, diphtheria was one of the most dreaded childhood diseases in the United States, killing over 10,000 people every year. We started vaccinating children against diphtheria in the 1930's and 40's, and the disease started disappearing. Today it is rare for a doctor even to see a case of diphtheria, much less have a child die from it.
- In 1962, the year before measles vaccine was introduced, almost 500,000 cases of measles were reported in the U.S. Ten years after we started vaccinating there were about 32,000 cases, and ten years after that there were fewer than 2,000. In 1998 and 1999, only about 100 measles cases were reported each year.
- Until the middle of the 20th Century, smallpox was one of the most devastating diseases the world has ever known. Millions died from it every year. In 1967, the World Health Organization declared war on smallpox with an intensive, worldwide vaccination campaign. Twelve years later, smallpox was wiped out — gone from the Earth forever.
- Parents in the 1950's were terrified as polio paralyzed children by the thousands. Then we learned how to prevent polio using the Salk and Sabin vaccines. Now the fight against polio is nearly won, and soon it will join smallpox as nothing but a bad memory.

Before we discuss the 12 routine childhood vaccines and the diseases they can prevent, let's take a brief look at what vaccines are and how they work. Then we will answer some of the questions parents ask about childhood shots.

How Immunity Works

You get sick when your body is invaded by germs. When measles virus enters your body it gives you measles. Whooping cough bacteria cause whooping cough. And so on.

It is the job of your immune system to protect you from these germs. Here's how it works:

Germs 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 to get well.

Now the antibodies start doing their second job. They 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 chickenpox only once, even though they might be exposed many times during their lifetime.

This is a very effective system for preventing disease. The only problem is you have to get sick before you develop immunity.

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 - measles vaccine is made from measles virus, for instance, and *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 as 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. The 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.

Questions & Answers

How many shots does my child need, and when?

Some children should get their first shot (hepatitis B) before leaving the hospital after birth. Others begin at 2 months of age. You will have to return for more shots several more times before the child starts school. Your doctor or nurse will tell you when to come back. There is a [schedule](#) in the appendix of this booklet showing the recommended ages for each shot.

Why do children need so many shots?

There are 12 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 (*Chickenpox*), Hepatitis A, and Pneumococcal disease. At least one shot 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, or that they may not work as well, or that they will overload the child's immune system. But studies have shown these fears to be unfounded. Vaccinations are just as safe and just as effective when given together as they are when given separately. The immune system is exposed to many foreign substances every day, and will not 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. More combinations are being developed, so in the future, even fewer shots will be needed for the same number of vaccines.

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% of severe disease caused by *Haemophilus influenzae* type B occurs in children under 12 months of age. Infants less than 6 months of age are at highest risk for serious complications of pertussis - 72% of children under 6 months who get pertussis must be hospitalized, and 84% of all deaths from pertussis are among children under 6 months. The ages at which vaccines are recommended are not arbitrary. They are chosen to give children the earliest and best protection against disease.

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 kill thousands of people in the United States every year. In the 1940's and 1950's tens of thousands of children were crippled or killed by polio. As recently as the mid-1980's, 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. They still kill children every year, even in the United States.

What will happen if my child *doesn't* get these shots?

Basically, 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 would get the disease. What happens then depends on the child and the disease. The child could get mildly ill and have to stay inside for a few days. He could get very sick and have to go to the hospital. At the very worst, he could die. In addition, he 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.

What are my child's chances of being exposed to these diseases?

It's hard to say. Some of these diseases are very rare in the U.S. today, so the chances of exposure are small. Others are still fairly common. Some are rare in the U.S. but common elsewhere in the world. Don't assume your child is completely safe from these diseases, even the rare ones. For instance, a child in the United States has only a tiny chance of catching diphtheria. But several years ago a boy in California did catch diphtheria and he died. He was the only child in his class who hadn't been vaccinated.

Are shots safe?

Shots 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 doctor or nurse can discuss the risks with you before your child gets her shots. The important thing to remember is that getting the diseases is *much* more dangerous than getting the shots.

Do shots always work?

Shots work most of the time, but not always. Most childhood immunizations give immunity to 90%-99% of the children who get them. But occasionally a child will not 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 vaccination has to depend on the immunity of others around her for protection. She could be infected by a child who hasn't been vaccinated, but not by one who is immune.

What if my child didn't start her shots on time, or gets behind schedule? Will they still work?

Yes. If your child has gotten behind in the schedule, it is not too late. Most of these shots can be given at any age, and a child who has gotten behind does not have to start over. The shots already given will still count, and the child will still develop immunity. Just contact your doctor or health department clinic.

Isn't getting all these shots expensive?

It doesn't have to be. Vaccines are free if you take your child to a public health clinic (for instance, a state or local clinic), although you might have to pay a small fee for the nurse to give the shots. If you go to a private doctor, vaccines might be covered by your health insurance. Or a program called "Vaccines for Children" (VFC) might pay for your shots if you are enrolled in Medicaid, don't have health insurance, or are an American Indian or Alaska Native.

Reading this booklet might help you answer other questions you have about childhood immunizations. But if you still have questions, please discuss them with your doctor or with the staff at the clinic, or see the Appendix of the booklet for [sources of more information](#).