



Childhood Immunizations



Not too long ago there were about 48,000 cases of *rubella*, 21,000 cases of *diphtheria*, and 16,000 cases of paralytic *polio* in the United States each year. But now, very few Americans have seen a baby born with deformities caused by German measles (rubella), a child struggling to breathe and swallow because of diphtheria, or a teenager hobbled by heavy leg braces and crutches because of polio.

Immunizations have controlled many dangerous, infectious diseases. Since so few of us ever see these diseases, it's easy to assume the problems are solved. But if we fall behind in our vaccinations, we run the risk of returning to the old days.

*Why have these diseases—
and many others—all but
vanished? The credit goes
to immunizations.*

Safety First

All parents want to be sure that vaccinations are safe for their children. And since many serious childhood infections are rare in the U.S., some parents may feel that it's safer to skip the shots. **But these infections have become rare because of immunizations, and our children continue to need protection.**

No medical treatment is 100% risk-free. In the case of recommended immunizations, experts who have studied the evidence conclude that the benefits far outweigh the possible problems. Scientists agree that neuropsychiatric problems, such as autism and ADHD, are **not** caused by immunizations or by any vaccine components, including thiomersol.

For more information about Childhood & Adult Immunizations from Harvard Health Publications, go to www.patientedu.org/immunization.

How Immunizations Work

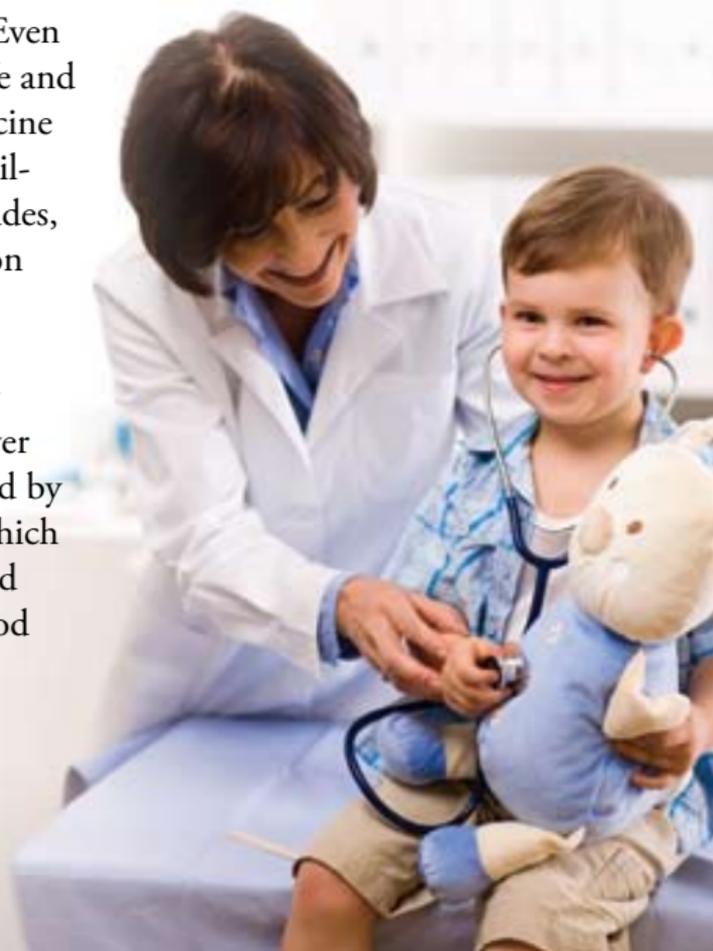
When viruses and bacteria invade the body, the immune system does its best to fight off the tiny aliens. The body produces *antibodies* and *immune cells* that attack proteins or other targets on the invading microbes. If all goes well, the microbes are killed off, and you start to feel better. But until the immune system kicks in, you may be terribly ill.

Immunizations short-circuit this struggle. Most vaccines rely on *active immunization*—vaccines that are made from a protein or other chemical extracted from the microbe, or from live but weakened viruses. In either case, the vaccine tricks the immune system into producing antibodies and cells that are able to quickly attack dangerous strains that may come along in the future, even before they make you sick.

Recommended Childhood Vaccinations

Here is a quick rundown on some of the standard vaccinations recommended for American children:

Hepatitis B. Even though a safe and effective vaccine has been available for decades, over 1 million Americans suffer from chronic liver disease or liver cancer caused by this virus, which is transmitted through blood



or body fluids or at birth. If a pregnant woman has hepatitis B, her baby should be given hepatitis B immune globulin at the time of birth, followed by the vaccine later on. **Other babies should get the vaccine during the birth hospitalization, with a second dose at 1 to 2 months of age and a third at 6 to 15 months of age.** Side effects are rare, but people who are allergic to yeast or the vaccine should not get it.

Diphtheria, Tetanus, and Pertussis (Whooping Cough).

A single vaccine provides excellent protection against these three serious infections. **Children should get the standard vaccine at 2, 4, and 6 months of age with a fourth dose between 15 to 18 months of age and a fifth between 4 to 6 years of age.** Milder booster vaccines should be given at 11 to 12 years of age and then every 10 years throughout life. Side effects may include pain at the injection site, fever, and prolonged crying. More serious reactions have become rare since improved vaccines were introduced.

Hemophilus influenzae type B (Hib). Despite the confusing name, this vaccine protects against a serious bacterial infection, not the “flu” virus. Before the vaccine, Hib caused tens of thousands of cases of meningitis, pneumonia, and blood infections in young children. These life-threatening infections are now very rare in immunized children.

Two Hib vaccines are available in the U.S. **One is given at 2, 4, and 6 months of age with a booster at 12 to 15 months of age. The other option is given at 2 and 4 months of age with a booster at 12 to 15 months of age.** Side effects include mild pain and swelling at the injection site.

Polio. Control of polio is one of the greatest triumphs of modern medicine. Because of the vaccine, the U.S. has been free of the disease since 1979. But since 25 countries still have polio, American children should be immunized to protect them from imported cases.



Although both oral and injected polio vaccines are effective, only the injected vaccine is recommended for routine use in the U.S. **The first 2 doses are given at 2 and 4 months of age, with boosters between 6 to 18 months of age and 4 to 6 years of age.** Side effects are rare, but children who are highly allergic to neomycin, streptomycin, or polymyxin should not receive it.

Measles, Mumps, and Rubella (*German Measles*). The measles, mumps, and rubella (MMR) vaccine provides excellent protection against 3 major viral infections. Individual vaccines are available for each virus, but the combination is preferred for standard use in healthy children. A combination MMR-varicella (chicken pox) vaccine is also available.

Children should get their first MMR shot between 12 and 15 months of age. A second dose is recommended at the time of school entry between ages 4 and 6 years. Side effects may include fever, rash, and mild joint pain, all of which are temporary.

Chicken Pox Vaccine. The varicella zoster virus causes chicken pox (*varicella*) in children and shingles (*herpes zoster*) in adults. Before the chicken pox vaccine

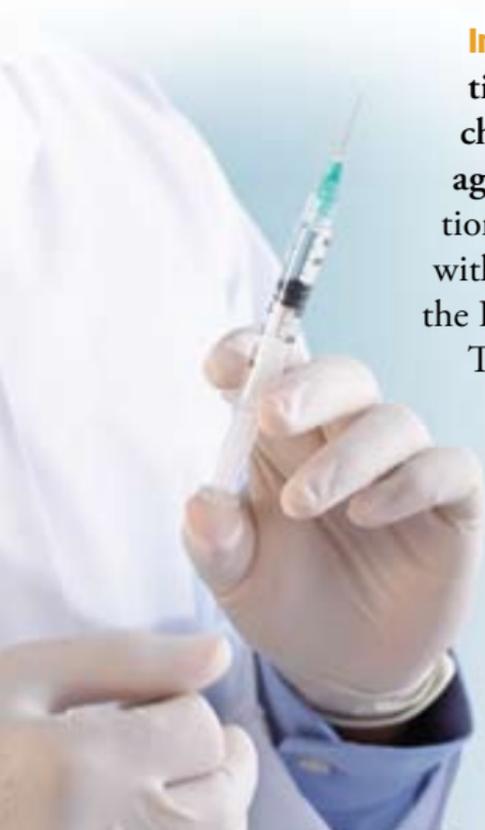
became standard in 1995, the virus caused almost 4 million cases and 100 deaths in the U.S. each year.

Healthy children should get their first varicella zoster vaccine shot between 12 and 15 months of age, with a second dose between ages 4 and 6 years. Children should not take aspirin for at least 6 weeks after vaccination. Side effects may include fever, rash, and pain at the injection site.

Pneumococcal Vaccines. *Pneumococcus* is a major cause of meningitis, pneumonia, blood, and sinus infections throughout life, and it's a leading cause of childhood ear infections.

This childhood vaccine protects against the 7 most common types of pneumococcus and is very effective. Side effects may include pain and swelling at the injection site and fever; more serious reactions are rare. **Children should receive 3 shots of the vaccine, which are recommended at 2, 4, and 6 months of age.**

Hepatitis A. Although it's less serious than hepatitis B, this viral liver infection is quite common in the U.S. **Children should receive two doses of the vaccine at least 6 months apart, ideally between 12 and 23 months of age.** Mild pain at the injection site is the only common side effect.



Influenza. Annual vaccination is recommended for children 6 to 59 months of age. After 5 years, vaccination is recommended for those with certain risk factors, (see the PEC brochure, 'Influenza'). Two types of the vaccine are available: an injected vaccine and a nasal spray. The injection is available for anyone over 6 months, whereas the nasal spray can only

be given to those 2 years and older. Children between 6 months and 8 years of age who have never had a flu vaccination should get 2 doses at least 4 weeks apart; others need just 1 dose. The nasal spray may cause a runny nose and sore throat. The flu shot may cause pain at the injection site.

Rotavirus. The rotaviruses are important causes of severe diarrhea in young children. An oral vaccine that protects against 5 strains of the virus is recommended in the U.S. **Doses are given at 2, 4, and 6 months of age.** Infants should not receive the vaccine if they have diarrhea, fever, or conditions that weaken the immune system. Although intestinal complications led to the withdrawal of an earlier vaccine, the current preparation appears to be safe and effective.

Human Papillomavirus (HPV). HPV is a sexually transmitted infection (see the PEC brochure ‘Sexually Transmitted Diseases’). The virus causes genital warts in men and women, cervical cancer in women, and penile or anal cancers in some men. The vaccine provides excellent protection against 4 major strains of HPV and was licensed in the U.S. in 2006. **It is recommended for all girls and women between the ages of 9 and 26 years.** Three doses are injected over a 6-month period. Significant side effects are rare.





To learn more about immunizations, visit the Pri-Med Patient Education Center at www.patientedu.org.

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