

# Use These CDC Fact Sheets to Keep Patients and Staff Up to Date on Vaccine Topics

## The Advisory Committee on Immunization Practices (ACIP)

For more information on vaccines, vaccine-preventable diseases, and vaccine safety:  
<http://www.cdc.gov/vaccines/immunization>

- The Centers for Disease Control and Prevention (CDC) sets the U.S. childhood immunization schedule based on recommendations from the Advisory Committee on Immunization Practices (ACIP).
- Before recommending a vaccine the ACIP considers many factors, including the safety and effectiveness of the vaccine.
- Candidates for ACIP membership are screened carefully prior to being selected to join the committee.
- The ACIP develops vaccine recommendations for children and adults. The recommendations include the ages when the vaccine should be given, the number of doses needed, the amount of time between doses, and precautions and contraindications.

candidate or an immediate family member by a vaccine manufacturer, holding a patent on a vaccine or related product, or serving on a Board of Directors of a vaccine manufacturer, exclude people from ACIP membership. However, because ACIP members are experts in the vaccine field, they may be involved in vaccine studies. Therefore, ACIP members who lead vaccine studies at their respective institutions may become ACIP members but they must abstain from voting on recommendations related to the vaccine they are studying. In addition, they cannot vote on any other vaccines manufactured by the company funding the research or on any vaccine that is similar to the one(s) they are studying.

**The Adult Immunization Schedule** Adults also need protection against several vaccine-preventable diseases. Therefore, in addition to the childhood immunization schedule, the ACIP makes recommendations for the adult immunization schedule. The ACIP considers many of the same factors for adult immunization recommendations that they consider when making recommendations about the childhood schedule. The professional organizations that work with the ACIP to develop the annual adult schedule include the American College of Obstetricians and Gynecologists (ACOG), the American College of Physicians (ACP), and the American Academy of Family

### questions and answers

#### What is the ACIP?

The Advisory Committee on Immunization Practices (ACIP) is a federal advisory committee that provides recommendations to the CDC on the U.S. childhood immunization schedule. The ACIP consists of 15 experts who are leading experts in the fields of immunology, pediatric medicine, virology, public health, and infectious disease. The members are appointed by the Secretary of Health and Human Services (HHS) and are appointed for a 3-year term. The ACIP develops the annual immunization schedule. The ACIP also provides recommendations on the use of vaccines in special circumstances. People who submit vaccine-related information are not considered for membership. For more information on vaccines, vaccine-preventable diseases, and vaccine safety, visit [www.cdc.gov/vaccines/immunization](http://www.cdc.gov/vaccines/immunization).

## Ensuring the Safety of Vaccines in the United States

- Currently, the United States has the safest, most effective vaccine supply in its history.
- The United States' long-standing vaccine safety system ensures that vaccines are as safe as possible. As new information and science become available, this system is, and will continue to be, updated and improved.
- The U.S. Food and Drug Administration (FDA) ensures the safety, effectiveness, and availability of vaccines for the United States. Before the FDA licenses (approves) a vaccine, the vaccine is tested extensively by its manufacturer. FDA scientists and medical professionals carefully evaluate all the available information about the vaccine to determine its safety and effectiveness.
- Although most common side effects of a vaccine are identified in studies before the vaccine is licensed, rare adverse events may not be detected in these studies. Therefore, the U.S. vaccine safety system continuously monitors for adverse events (possible side effects) after a vaccine is licensed. When millions of people receive a vaccine, less common side effects that were not identified earlier may show up.

**Adverse Events and Side Effects** Adverse events reported to the Vaccine Adverse Event Reporting System (VAERS) are not necessarily side effects caused by vaccination. An adverse event is a health problem that happens after vaccination that may or may not be caused by a vaccine. By definition, a side effect has been shown to be linked to a vaccine by scientific studies.



## Understanding the Vaccine Adverse Event Reporting System (VAERS)

The Vaccine Adverse Event Reporting System (VAERS) is one component of the U.S. comprehensive vaccine safety monitoring system. VAERS reports are monitored carefully by the Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA). Reports of adverse events (possible side effects) after vaccination do not mean that the reported problem was caused by a vaccine. Reports are signals that alert scientists of possible cause-and-effect relationships that need to be investigated. Anyone can submit a report to VAERS including health care professionals, vaccine manufacturers, vaccine recipients, and parents or family members of people who have received a vaccine.

## Understanding How Vaccines Work

Diseases that vaccines prevent can be dangerous, or even deadly. Vaccines greatly reduce the risk of infection by working with the body's natural defenses to safely develop immunity to disease. This fact sheet explains how the body fights infection and how vaccines work to protect people by producing immunity.

### The Immune System—The Body's Defense Against Infection

To understand how vaccines work, it is helpful to first look at how the body fights illness. When germs, such as bacteria or viruses, invade the body, they attack and multiply. This invasion is called an infection, and the infection is what causes illness. The immune system uses several tools to fight infection. Blood contains red blood cells, for carrying oxygen to tissues and organs, and white or immune cells, for fighting infection. These white cells consist primarily of B-lymphocytes, T-lymphocytes, and macrophages.

- Macrophages** are white blood cells that swallow up and digest germs, plus dead or dying cells. The macrophages leave behind parts of the invading germs called antigens. The body identifies antigens as dangerous and stimulates the body to attack them.
- Antibodies** attack the antigens left behind by the macrophages. Antibodies are produced by defensive white blood cells called B-lymphocytes.
- T-lymphocytes** are another type of defensive white blood cell. They attack cells in the body that have already been infected.

The first time the body encounters a germ, it can take several days to make and use all the germ-fighting tools needed to get over the infection. After the infection, the immune system remembers what it learned about how to protect the body against that disease.



## Understanding Thimerosal, Mercury, and Vaccine Safety

For more information on vaccines, vaccine-preventable diseases, and vaccine safety:  
<http://www.cdc.gov/vaccines/immunization>

- Thimerosal is a mercury-containing compound that prevents the growth of dangerous bacteria and fungi. It is used as a preservative for flu vaccines in multi-dose vials, to keep the vaccine free from contamination. Thimerosal is also used during the manufacturing process for some vaccines to prevent the growth of microbes.
- In 1999, as a precautionary measure, the U.S. Public Health Service recommended removing thimerosal as a preservative from vaccines to reduce mercury exposure among infants as much as possible.
- Today, except for some flu vaccines in multi-dose vials, no recommended childhood vaccines contain thimerosal as a preservative.
- In all other recommended childhood vaccines, no thimerosal is present or the amount of thimerosal

### questions and answers

#### What is thimerosal? Is it the same as mercury?

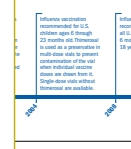
Thimerosal is a compound that contains mercury. Mercury is a metal found naturally in the environment.

**Why is thimerosal used in some vaccines?** Because it prevents the growth of dangerous microbes, thimerosal is used as a preservative in multi-dose vials of flu vaccines, and in two other childhood vaccines. It is used in the manufacturing process. When each new needle is inserted into the multi-dose vial, it is possible for microbes to get into the vial. Therefore, thimerosal prevents contamination in the multi-dose vial when individual doses are drawn from it. Keeping a vaccine contaminated with bacteria can be deadly.

For two childhood vaccines, thimerosal is used to prevent the growth of microbes during the manufacturing process. When thimerosal is used this way, it is removed later in the process. Only trace levels of thimerosal are present in these two vaccines today. Thimerosal is one DTaP and one DTap-Hb

#### What is removed from vaccines given

Drug Administration (FDA) was required by law to remove all the products the agency uses. The U.S. Public Health Service decided only those should be removed from vaccines, possible source of mercury in vaccines. Even



## Vaccine Information Statements (VIS) are information sheets produced by the Centers for Disease Control and Prevention (CDC) that explain to vaccine recipients, their parents, or their legal representatives both the benefits and risks of a vaccine. Federal law requires that VISs be handed out whenever (before each dose) certain vaccinations are given.

### Adverse events reported to VAERS are not necessarily side effects caused by vaccination. An adverse event is a health problem that happens after vaccination that may or may not be caused by a vaccine. These events may require further investigation. By definition, a side effect has been shown to be linked to a vaccine by scientific studies.

Before the FDA licenses (approves) a vaccine for use, the vaccine must be tested with volunteers during clinical trials to make sure it is safe and effective. Sometimes side effects show up in clinical trials. Most often side effects found in clinical trials are minor such as possible pain at the injection site, and the vaccine is licensed because the disease prevention benefits outweigh the risk of getting the side effect.

As a part of the United States' comprehensive vaccine safety monitoring system, VAERS detects rare vaccine adverse events, signaling to scientists that focused studies are needed to determine whether the adverse event is a side effect of a vaccine or is not related to it.



Download these CDC fact sheets at [www.cdc.gov/vaccines/spec-grps/hcp/provider-resources-safety-sheets.html](http://www.cdc.gov/vaccines/spec-grps/hcp/provider-resources-safety-sheets.html)