



Resources

August is National Immunization Month. Mark your calendar every year to remind yourself to update the family's immunizations before returning to school.

¹The Children's Hospital of Philadelphia manages a Vaccine Education Center website with a wealth of information about immunizations. It has all the information translated into **Spanish** by clicking an icon in the right-hand column:

<http://www.chop.edu/consumer/jsp/division/generic.jsp?id=75697>.

²Centers for Disease Control:
www.cdc.gov/vaccines

For information about individual vaccines, visit
www.cdc.gov/vaccines/vpd-vac/default.htm

³American Academy of Pediatrics (AAP):
www.aap.org/healthtopics/immunizations.cfm

⁴The "Family and Community Resources" item in the AAP's website contains the answer to many common questions on childhood immunizations: (<http://www.cispimmunize.org/pro/pdf/Vaccineschedule.pdf>)

⁵National Institute of Allergy and Infectious Diseases: presents in depth information about the immune system and formulating vaccines.
<http://www3.niaid.nih.gov/topics/vaccines/understanding/howWork.htm>

Immunizations: Our Health Depends On Them



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Introduction

With the start of the school year and the threat of H1N1 influenza lurking, now is a good time for everyone to update their immunizations. But are all these shots really necessary?

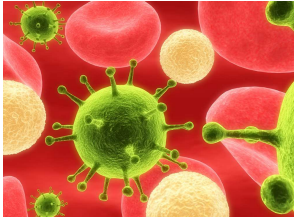
According to the Children's Hospital of Philadelphia, every year before immunizations were introduced in the United States:

- Polio paralyzed 10,000 children
- Rubella (German measles) caused birth defects and mental retardation in as many as 20,000 newborns
- Measles infected about 4 million children, killing 3,000
- *Haemophilus influenzae* type b (Hib) caused meningitis in 15,000 children, leaving many with permanent brain damage
- Pertussis (whooping cough) would kill thousands of infants.

Are vaccines Important Today?

The Centers for Disease Control (CDC) states that immunizations are one of modern medicine's most significant public health achievements. Yet tens of thousands of Americans still die from vaccine-preventable diseases every year.

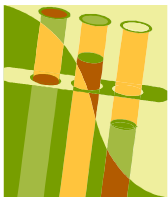
- A vaccinated child or adult not only is protected from disease, but protects other children and adults by not transmitting the disease.
- Newborns have some immunity from their mothers, but only for a few months and not against some vaccine-preventable diseases. Before vaccines, many babies died from whooping cough, measles, and polio.
- Immunized persons help protect the health of those who cannot receive certain vaccines, like babies and people with certain medical conditions (cancers, HIV, etc).



How do vaccines work?

Our immune system is composed of many cells, glands, and fluid that fight invading bacteria and viruses. The immune system recognizes specific pieces of a germ (**antigens**) as “foreign”, and responds by producing substances called **antibodies** to fight the germ. The immune cells that produce antibodies remain as memory cells and can defend against another invasion by that particular germ years later.

Vaccines contain antigens or parts of antigens that resemble specific germs (e.g. measles, influenza, polio). The body’s immune system recognizes the vaccine as “foreign” and produces antibodies. If the immunized person is infected by that germ later, the memory antibody-producing cells will prevent illness.



What is in a vaccine?

A vaccine contains one of several types of antigen to trigger an immune response. The type of antigen in a vaccine is chosen to produce the best protection against a particular germ:

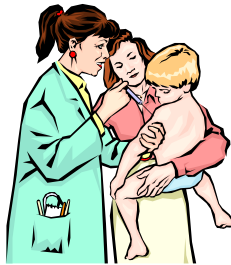
- Weakened live virus: e.g. measles, mumps, rubella, rotavirus, chickenpox, some influenza
- Inactivated (killed) virus: e.g. polio, hepatitis A, influenza, rabies
- Partial (subunit) virus: a piece of killed virus, e.g. hepatitis B, HPV
- Partial (subunit) bacterium: a piece of the sugar coating of a bacterium (Hib, pneumococcus, meningococcus), or a bacterium’s toxin (harmful protein) that has

been inactivated (diphtheria, tetanus, pertussis)

- Vaccines using viral DNA pieces are being developed

Other ingredients present in some vaccines⁴:

- Preservatives: prevent contamination of the vaccine by germs
- Adjuvants: aluminum salts that help the body create a better immune response and lessen the number of shots needed for protection. The amount of aluminum in vaccines is negligible compared to everyday exposure
- Formaldehyde: traces may be present in some vaccines, but less than what normally circulates in our bloodstream
- Antibiotics: prevent bacterial contamination of the vaccine. Rarely cause allergic reactions
- Egg protein: influenza and yellow fever vaccines are produced in eggs and may cause allergic reactions
- Gelatin: may cause allergic reactions



Why do kids need so many vaccines?

Children do get more shots now than ever before because scientists have developed vaccines against more diseases.

The schedule of immunizations is reevaluated every year according to the latest research. The age for the first dose, spacing of shots, and number of shots needed for immunity are determined to create the best immune response and protect children at the youngest safe age.

Spacing out or delaying immunizations can leave children unprotected, result in illness or death, and may not create the optimal immune response to a disease.

Measles outbreaks do occur because of delayed immunizations.

Pediatricians can determine if, for medical reasons, a child needs a special immunization schedule.

Children’s Hospital of Philadelphia has a current suggested childhood immunization schedule at: <http://www.chop.edu/consumer/jsp/division/generic.jsp?id=75700>.



Current Vaccines

Vaccines are used to prevent diseases in many populations:

- Childhood immunizations: measles, mumps, polio, chickenpox, etc
- Seasonal immunizations: influenza
- Special cases: HPV (cervical cancer), pneumococcus (pneumonia), meningococcus (meningitis), rabies, yellow fever, etc. There are specific immunization recommendations for **pregnant women, healthcare and childcare workers, and persons traveling outside the country**. Check with your physician
- The CDC keeps a complete list of vaccines, information about them, and for whom they are recommended at www.cdc.gov/vaccines/vpd-vac/default.htm
- Boosters of some childhood vaccines may be needed for teenagers and adults (tetanus, pertussis); check with your physician

Final Thoughts

- Children can usually get vaccinated even if they have a mild illness; call your pediatrician if your child is sick and is due for immunizations
- Thimerisol, a mercury-based preservative, was removed from most childhood vaccines in 2001. It is still present in some influenza vaccines. **Valid scientific studies do not support any link between thimerisol and autism.** For the Institute of Medicine report, go to <http://www.iom.edu/CMS/3793/4705/4717.aspx>