Vaccine Safety:

Answers to Parents' Top Questions

As a parent, you want to make the best decisions to protect your child—staying informed will help. Your questions are important, and you deserve reliable information to support your decisions. If you want to learn more, ask your doctor for a "consultation visit," or check out the websites at the end.

1. Are Vaccines safe?

Yes. Vaccines are very safe[1]. In fact, experts including American Academy of Pediatrics, the Institute of Medicine, and the World Health Organization agree that vaccines are even safer than vitamins. Millions of children and adults are vaccinated every year—safely. Thousands of people take part in clinical trials to test a vaccine before it is licensed by the Food and Drug Administration (FDA). After it's licensed, the Vaccine Adverse Events Reporting System (VAERS) helps track any health effect that happens hours, days, weeks, or even months later. Anyone can report a possible side effect so that it can be studied. VAERS and other monitoring programs help ensure vaccines are safe.

Matthew's Story

Matthew's parents decided their son could wait to get the vaccine against Hib disease, a disease they hadn't heard about. Then one day Matthew complained of throat pain. "We thought it was strep throat and took him to the local hospital." The doctor there diagnosed Hib disease, and told them their son might die within minutes.

See full story at: shotbyshot.org/hib/a-hib-story

2. What kind of side effects should I know about?

Any medicine can cause reactions in some people. The most common side effects from vaccines are swelling or tenderness at the injection site and fever. Serious allergic reactions are very rare, happening in about 1 person out of a million[2] shots given. If you are concerned about possible side effects, ask questions about what to expect. If you notice an unusual reaction hours or days after your child's immunizations, call the doctor's office for advice.

3. Why do children today get so many immunizations?

Thirty years ago, vaccines protected young children from only seven diseases. In 2014, we can protect them from at least 14 dangerous diseases because of medical advances. Many shots are also "boosters" of the same vaccine to give children the best protection possible.

4. Are diseases of the "old days" still around?

Yes. Pertussis (whooping cough) is still common in the U.S. Other diseases, such as measles and polio, are circulating in other parts of the world. It just takes one unimmunized traveler to bring a disease home from another country. If immunization levels drop, the rare cases we have in the U.S. could very quickly multiply—putting our children in danger.

Vaccine Safety:

Answers to Parents' Top Questions

- Measles, for instance, is still common in Europe, Africa, and Asia and continues to show up in California. The disease can cause hospitalizations and death. In 2014, over 60 measles cases were reported in California—many linked to travelers who caught the disease while visiting Asia and then spread the disease to others after returning home.
- In 2010, almost 10,000 people in California became ill with whooping cough, and ten infants died. In 2014, California declared another whooping cough epidemic.
- Before chickenpox vaccine was developed, the disease put more than 12,000 Americans in the hospital and caused more than 100 deaths each year.[3] Children who get chickenpox can get serious skin infections or pneumonia.

5. What about holistic medicine?

Holistic medicines may be helpful for some conditions, but only vaccines provide specific immunity to diseases. Only vaccines have been scientifically proven to protect against whooping cough, measles, mumps, and other diseases.

Breastfeeding is very healthy for your baby, but breastfeeding alone cannot fully protect babies from diseases like whooping cough or measles. Also, antibodies passed on from moms to babies during pregnancy do not last beyond infancy.[4]

6. What about "natural immunity"?

Some people think getting a disease is the "natural" way to trigger the body's immune response, but this comes at a risk—many vaccine-preventable diseases can have dangerous complications, like pneumonia, blindness, brain damage, and even death.

Vaccines safely trigger a natural immune response—but not the disease. Most vaccines are over 99% effective in preventing illness.

7. Is it safe for a child's immune system to have multiple shots?

Yes. Children are exposed to hundreds of viruses and bacteria[5] during normal activities like eating and playing. Getting vaccines is no extra burden on the immune system—even for babies.[6] Getting combination vaccines, like MMR (that protects against measles, mumps, and rubella), or getting multiple shots during one visit is very safe. Today's vaccines are more refined, so even though kids receive more vaccines, they receive far fewer pieces of germs overall[7] (compared to their parents or grandparents).

8. What about kids with allergies or other health conditions?

Vaccines are safe for kids with most kinds of allergies.[8] Getting shots may be especially important for children with certain health problems who can get very sick if they catch a disease. If your child has an allergy or any health condition, talk with your doctor. The doctor can tell you if any vaccine should be postponed or avoided.

9. What about autism?

While some parents first notice signs of autism at about the same time their child gets vaccinated, the two events are not related. Dozens of scientific studies[9] have concluded that there is no link between vaccines and autism. The following organizations have issued statements saying that there is no connection between vaccines and autism: Autism Science Foundation, American Academy of Pediatrics, Institute on Medicine, Mayo Clinic, National Institutes of Health, and World Health Organization.

Vaccine Safety:

Answers to Parents' Top Questions

Autism has been diagnosed more often around the world for many years, yet autism rates are the same in vaccinated and unvaccinated children.[10] Recent studies on autism suggest that children with autism have too many cells in a key area of the brain needed for communication, social and emotional development. This type of brain development occurs during the second trimester of pregnancy—long before a child gets any vaccinations.[11, 12]

In 1998, one study used falsified data to suggest a connection between the MMR vaccine and autism. After further investigation, the journal retracted the study, and the lead author lost his medical license.

10. Are vaccines harmful because of their ingredients?

No. Although some vaccine ingredients sound like foreign substances, they are familiar to your body. Here are the facts:

- **Aluminum** is used in very small amounts to boost the body's immune response, making the shots more effective. Aluminum also occurs naturally in soil, water, and air. During the first 6 months of life, your baby gets more aluminum from breast milk or soy formula[13] (10 to 140 milligrams) than from all shots combined! Aluminum does **not** build up, and most leaves the body within a couple of weeks.
- **Formaldehyde** is sometimes used to keep vaccines germ-free, but it's also produced naturally in the human body as a normal bodily function to produce energy. In fact, studies show that newborns weighing six to eight pounds already have 50-70 times more[14] formaldehyde in their bodies naturally than they would receive from a single dose of vaccine.
- **Thimerosal** is a mercury-containing preservative that is no longer used[15] in routine vaccines, except some forms of flu vaccine. Though no harm is known to have been caused by thimerosal in vaccines, as a precaution California law[16] prohibits giving thimerosal-containing vaccines to pregnant women and children under age 3. Thimerosal-free flu vaccine is widely available.

11. What about getting shots later or spreading them out?

Skipping or delaying shots leaves your child at risk of catching serious diseases at younger ages—when these diseases are most dangerous. That's why most doctors follow the CDC's recommended immunization schedule, which is based on independent medical science review and updated each year. The schedule on the back of this fact sheet follows CDC's recommendations and helps you keep track of your child's immunizations.

Advice to spread out shots is not based on science.[17] Spreading out shot visits may make you feel more comfortable, but it's no help to your child. Research shows that getting several shots at the same visit is safe.[18] Spreading out shots may actually be more stressful for your child.

As a parent, you need to know the risks of skipping or delaying vaccines. So, talk to your doctor. Use reliable sources to make your decision.

Be choosy about what you read.
We recommend these trusted sites:

American Academy of Pediatrics
Aap.org/immunization

Centers for Disease Control and Prevention (CDC)
Cdc.gov/vaccines

Children's Hospital of Philadelphia
Chop.edu/service/vaccine-education-center

U.S. Dept. of Health and Human Services
Vaccines.gov

Evaluating Health Information on the Web
Immunizationinfo.org/parents/evaluatingWeb.cfm

Mayo Clinic
Bit.ly/childVacQx

Parents of Kids with Infectious Diseases
Pkids.org

Thimerosal FAQs
Fda.gov/CBER/vaccine/thimerosal.htm

WebMD
Webmd.com/children/vaccines/default.htm

Make sure your child is up-to-date

_____'s Immunization Schedule

your child's name

	Date: Time:	Date: Time:	Date: Time:	Date: Time:	Date: Time:	Date: Time:
Birth	**Age 2 months**	**Age 4 months**	**Age 6 months**	**Age 12 months**	**Age 15 months**	**Age 18 months**
Hepatitis B	Diphtheria, Tetanus, Pertussis	Diphtheria, Tetanus, Pertussis	Diphtheria, Tetanus, Pertussis	Hepatitis A	Diphtheria, Tetanus, Pertussis	Hepatitis A
	Polio	Polio	Polio	Measles Mumps Rubella		
	Pneumococcal	Pneumococcal	Pneumococcal	Pneumococcal		
	Hib meningitis	Hib meningitis	Hib meningitis	Hib meningitis		
	Rotavirus	Rotavirus	Rotavirus	Chickenpox		
	Hepatitis B		Hepatitis B			

4-6 years
- Diphtheria, Tetanus, Pertussis
- Polio
- Measles, Mumps, Rubella
- Chickenpox

11-12 years
- Tetanus, Diphtheria, Pertussis
- Human Papillomavirus
- Meningococcal

16 years
- Meningococcal

Every Fall: Flu Vaccine Everyone 6 months and older

Footnotes

[1]Maglione MA et al. Safety of routine vaccines used by US children: A systematic review. Pediatrics 2014,134:2 377-379. Accessed August 4, 2014. http://pediatrics.aappublications.org/content/early/2014/06/26/peds.2014-1079.full.pdf+html.

[2]CDC. Vaccines & Immunizations-"Possible Side-Effects from Vaccines". Retrieved February 13, 2014 from http://www.cdc.gov/vaccines/vac-gen/side-effects.htm.

[3]CDC. Vaccines-Varicella Active Surveillance Project. http://www.cdc.gov/VACCINES/stats-surv/vasp/default.htm#risk. Retrieved January 16, 2014.

[4]Nates SV et al. Loss maternally derived measles immunity in Argentinian infants. Pediatr Infect Dis J. 1998 Apr;17(4):313-6. From: http://www.ncbi.nlm.nih.gov/pubmed/9576386.

[5]University of Utah Health Services. "Your Changing Microbiome". Retrieved on January 16, 2014 from http://learn.genetics.utah.edu/content/microbiome/changing/.

[6]Offit, PA et al. Addressing Parents' Concerns: Do Multiple Vaccines Overwhelm or Weaken the Infants Immune System? Pediatrics. 2002 January; 109(1): 124-9.

[7]Childrens Hospital of Philadelphia. (2013). Vaccines and the Immunization system. Retrieved on January 16, 2014 from http://www.chop.edu/service/vaccine-education-center/vaccine-safety/vaccines-and-immune-system.html#Do_vaccines_overwhelm.

[8]Kids with Food Allergies. (2012). "Do immunizations contain food allergens?" Retrieved on January 16, 2014 from http://www.kidswithfoodallergies.org/resourcespre.php?id=124.

[9]American Academy of Pediatrics. (2013). Vaccine Safety: Examine the Evidence. Retrieved on January 16, 2014 from http://www2.aap.org/immunization/families/faq/VaccineStudies.pdf.

[10]Madsen KM et al. A population-based study of measles, mumps, and rubella vaccination and autism. N Engl J Med. 2002 Nov 7;347(19):1477-82. http://www.ncbi.nlm.nih.gov/pubmed/12421889.

[11]Chow ML et al. Age-dependent brain gene expression and copy number anomalies in autism suggest distinct pathological processes at young versus mature ages. PLoS Genet. 2012;8(3):e1002592. From: http://www.ncbi.nlm.nih.gov/pubmed/22457638.

[12]Stoner, R. et al. Patches of Disorganization in the Neocortex of Children with Autism. N Engl J Med. 2014 Mar 27; 370:1209-1219. http://www.nejm.org/doi/full/10.1056/NEJMoa1307491.

[13]Childrens Hospital of Philadelphia. (2013). Vaccine and Aluminum. Retrieved on January 16, 2014 from http://www.chop.edu/service/vaccine-education-center/vaccine-safety/vaccine-ingredients/aluminum.html.

[14]FDA-Vaccines, Blood & Biologics. (2011). Common Ingredients in U.S. Licensed Vaccines. Retrieved on January 16, 2014 from http://www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/VaccineSafety/ucm187810.htm.

[15]Childrens Hospital of Philadelphia. (2013). Vaccines and Thimerosal. Retrieved on January 16, 2014 from http://www.chop.edu/service/vaccine-education-center/vaccine-safety/vaccine-ingredients/thimerosal.html.

[16]California Department of Public Health. California's New Law Limiting Mercury in Vaccines: Frequently Asked Questions. Retrieved on January 16, 2014 from http://www.cdph.ca.gov/programs/immunize/Documents/MercuryLawFAQ.pdf.

[17]Offit, PA; and Moser, CA. The Problem with Dr. Bob's Alternative Vaccine Schedule. Pediatrics. 2009 January; 123 (1): 164-69.

[18]Institute of Medicine. Childhood immunization schedule and safety: Stakeholder concerns, scientific evidence, and future studies. January 2013. Accessed August 4, 2014. http://www.iom.edu/Reports/2013/The-Childhood-Immunization-Schedule-and-Safety.aspx#sthash.BR3kPOeM.dpuf.