

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 the [American Academy of Pediatrics](#), the [National Academy of Medicine](#), and the [World Health Organization](#) agree that vaccines are safe. 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.

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 and similarly [quite rare for COVID-19 vaccinations](#). 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-five years ago, vaccines protected young children from only seven diseases. Today, we can protect them from at least 15 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.



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- [Measles](#). Measles remains common in many developing countries. Just before the COVID-19 pandemic hit, [over 200,000 Europeans caught measles in 2018 and 2019](#). Travelers can catch measles while overseas and spread it in California. Over 130 Californians caught measles in the winter of 2014-15; many of these had visited Disneyland theme park.
- In 2014, over 11,000 people in California became ill with whooping cough, hundreds were hospitalized, and three infants died. In 2010, almost 10,000 Californians caught whooping cough and 10 infants died.
- Before chickenpox vaccine was developed, the disease put more than 10,000 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 and breastfeeding?

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 COVID-19, flu, whooping cough, measles, and other diseases. Holistic practitioners including the [Academic Consortium of Integrative Medicine](#), [Naturopathic Doctors for Immunization](#), and [Dr. Andrew Weil](#) from the Center for Integrative Medicine all support immunization.

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. Why do kids need COVID-19 shots and boosters?

COVID-19 has killed more than 1 million Americans and millions more around the world. Doctors have identified a very serious complication called Multisystem Inflammatory Syndrome in Children (MIS-C) that can be life-threatening. COVID-19 vaccines and boosters have been shown to protect children against MIS-C and other severe outcomes of COVID-19. Over 31 million children have safely received the COVID-19 vaccine in the United States, and [ongoing safety monitoring](#) shows that COVID-19 vaccination continues to be safe for children. COVID-19 vaccines and boosters provide the best protection for children against severe COVID-19.

7. 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 do not cause the disease. While vaccines can prevent mild and severe illnesses, some, such as flu and COVID-19 vaccines, are more effective in preventing hospitalization and death than milder disease.

8. 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 antigens overall](#)⁷ (compared to their parents or grandparents).

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9. 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. There is [no link](#) between developing asthma or allergies and vaccines.

10. 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](#), [National Academy of Medicine](#), [Mayo Clinic](#), [National Institutes of Health](#), [World Health Organization](#).

While the rates of autism continue to rise around the world, [autism rates are no different in vaccinated and unvaccinated children](#).¹⁰ [Other 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.

11. What ingredients are in vaccines?

Some vaccine ingredients may sound like foreign substances, but 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 formula, including soy formula](#)¹³ 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 vaccines are widely available.

12. 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.

Make sure your child is up-to-date

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.



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

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

American Academy of Pediatrics
Healthychildren.org

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

Children's Hospital of Philadelphia
<http://bit.ly/CHOPvaxEdu>

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

Mayo Clinic
Bit.ly/childVacQx

Thimerosal FAQs
<https://www.fda.gov/vaccines-blood-biologics/safety-availability-biologics/thimerosal-and-vaccines>

Vaccinate Your Family
Vaccinateyourfamily.org

Vaccines: Calling the Shots (PBS documentary)
pbs.org/wgbh/nova/body/vaccines-calling-shots.html

Voices For Vaccines
VoicesforVaccines.org

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

¹Gidengil, C. et al. Safety of vaccines used for routine immunization in the United States: An update. Agency for Healthcare Research and Quality (US); 2021 May. AHRQ Comparative Effectiveness Reviews. <https://pubmed.ncbi.nlm.nih.gov/34279864/>.

²CDC. Vaccines & Immunizations-“Possible Side-Effects from Vaccines”. Retrieved January 19, 2023 from <http://www.cdc.gov/vaccines/vac-gen/side-effects.htm>.

³Nguyen HQ et al. Decline in mortality due to varicella after implementation of varicella vaccination in the United States, 2005, N Engl J Med 2005; 352:450-458 <http://www.nejm.org/doi/full/10.1056/NEJMoa042271>

⁴Niewiesk, S. Maternal antibodies: Clinical significance, mechanism of interference with immune responses, and possible vaccination strategies. (2014). Frontiers in Immunology. 5:46. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4165321/#:~:text=In%20humans%2C%20maternal%20antibodies%20wane,persist%20for%20a%20longer%20time>.

⁵University of Utah Health Services. “Your Changing Microbiome”. Retrieved on January 19, 2023 <http://learn.genetics.utah.edu/content/microbiome/changing/>.

⁶Nicoli F. & Appay V. (2017). Immunological considerations regarding parental concerns on pediatric immunizations. Vaccine 25;35(23)3012-3019. <https://pubmed.ncbi.nlm.nih.gov/28465096/>.

⁷Childrens Hospital of Philadelphia. (2013). Vaccines and the Immunization System. Retrieved on January 19, 2023 http://www.chop.edu/service/vaccine-education-center/vaccine-safety/vaccines-and-immune-system.html#Do_vaccines_overwhelm.

⁸Children’s Hospital of Philadelphia (2014) News and Views: Vaccines and Allergies. Retrieved on January 19, 2023. <https://www.chop.edu/news/vaccines-and-allergies>

⁹American Academy of Pediatrics. (2013). Vaccine Safety: Examine the Evidence. Retrieved on February 26, 2018 from <https://healthychildren.org/English/safety-prevention/immunizations/Pages/Vaccine-Studies-Examine-the-Evidence.aspx>.

¹⁰Madsen 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>.

¹¹Chow 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>.

¹²Stoner, 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>.

¹³Childrens Hospital of Philadelphia. (2013). Vaccine and Aluminum. Retrieved on January 19, 2023 from <http://www.chop.edu/service/vaccine-education-center/vaccine-safety/vaccine-ingredients/aluminum.html>.

¹⁴FDA-Vaccines, Blood & Biologics. (2011). Common Ingredients in U.S. Licensed Vaccines. Retrieved on January 19, 2023 from <http://www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/VaccineSafety/ucm187810.htm>

¹⁵Childrens Hospital of Philadelphia. (2013). Vaccines and Thimerosal. Retrieved on January 19, 2023 from <https://www.chop.edu/centers-programs/vaccine-education-center/vaccine-ingredients/thimerosal>

¹⁶California Department of Public Health. California’s New Law Limiting Mercury in Vaccines: Frequently Asked Questions. Retrieved on January 19, 2023 <http://www.cdph.ca.gov/programs/immunize/Documents/MercuryLawFAQ.pdf>.

¹⁷Children’s Hospital of Philadelphia (2017). When Individual Doctors Make their Own Immunization Schedules. Accessed January 19, 2023. <https://media.chop.edu/data/files/pdfs/vec-individual-doctors-vaccine-schedule.pdf>

¹⁸National Academy of Medicine. Childhood immunization schedule and safety: Stakeholder concerns, scientific evidence, and future studies. January 2013. Accessed January 19, 2023. <https://nap.nationalacademies.org/resource/13563/ChildhoodImmunizationScheduleandSafetyRB.pdf>

For more vaccine safety studies, visit eziz.org/resources/parented/studies