

Expert Answers to Your Questions About Vaccine Safety

Increasingly, physicians in community practice are seeing parents who hesitate or even refuse to have their children immunized against what used to be common childhood diseases, such as measles, mumps and rubella. This resistance is due, in large part, to a concern that vaccines can cause serious side effects, such as autism spectrum disorder. While there are no sound scientific studies to back this up, media coverage has lent the anti-vaccine movement growing credibility. Robert Frenck Jr., MD, professor of pediatrics at the University of Cincinnati College of Medicine and staff physician in the Division of Infectious Diseases at Cincinnati Children's, provides evidence-based answers to questions that many parents have regarding vaccine safety in the following Q and A list.

1. What are the benefits and risks of childhood vaccinations?

Vaccines are among the most remarkable achievements in the history of medicine. Thanks to the development

and widespread use of vaccines, we have reduced vaccine-preventable infections in the US by 95 to 99 percent. This means we've prevented 14 million infections and 33,000 deaths in the United States in 2008.

Ironically, the success of vaccines has led to concern about their safety. I remember polio and the fear every summer of people contracting the infection. When a vaccine became available, people rushed to receive it, praising the ability to rid society of this debilitating disease. Today, most young people in the US have never seen a case of polio and may well not even know of the infection. All this is due to the vaccines.

But when you don't see a disease, it's hard to perceive a benefit of prevention. So people have focused on the possible risks of vaccines. As with anything we do in medicine, vaccines have risks. However, the vast majority of risks are not severe and resolve within one to two days. The most common risks include pain and redness at the site of injection and low-grade fevers.

2. Who determines the childhood vaccination schedule most commonly followed by pediatricians?

Vaccine schedules in the US are developed by the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC), a group of vaccine experts, with input from the American Academy of Pediatrics (AAP) Committee on Infectious Diseases and the American Academy of Family Physicians. This schedule is published yearly in January and is the schedule recommended by the AAP.

3. There has been a lot of talk linking vaccines to autism, particularly the measles-mumps-rubella vaccine. Does the MMR vaccine cause autism?

No. More than a dozen studies have been published showing that autism is not associated with receiving vaccines. We have more than sufficient information to say that vaccines, including MMR, do not cause autism.

Autism, now more

commonly referred to as Autism Spectrum Disorder (ASD), is a collection of several disorders that have common areas of abnormality. The main areas are social skills, communication skills and repetitive or obsessive traits. These abnormalities are typically noted

between the first and second year of life. The MMR is also typically administered at this time.

It is understandable that people noted the events occurring at approximately the same time and concluded that the vaccine may be causing ASD. This belief was strengthened by a study published by a British physician who said the MMR, and specifically the measles vaccine, caused autism. This study has been discredited, and the co-authors of the study subsequently published a formal retraction.

While we still do not know exactly what does cause autism, it is likely caused by many factors, including genetics, abnormal brain growth, environmental triggers and prematurity. Further studies to evaluate a link between vaccines and ASD is not beneficial and actually spends precious resources that could be re-directed toward research critical to understanding and hopefully preventing ASD.

4. Many pediatricians offer limited amounts of thimerosal-free flu shots. How important is it for a child, particularly an infant, to receive a thimerosal-free flu shot?

Thimerosal, composed of ethyl mercury, is a compound used as a preservative in vaccines. Ethyl mercury is quickly eliminated by the body and DOES NOT cause mercury poisoning. Mercury poisoning is caused by methyl mercury, a compound that does build up in the body and can result in damage to the nervous system and brain. So, while the two types of mercury sound similar, they are very different.



Thimerosal has not been shown to be toxic. Also, even when it was present in vaccines, the total amount of thimerosal containing mercury received by an infant was less than half the amount of mercury a baby receives from its mother if breast fed for six months. When looking only at flu shots, breast-fed babies receive 25 times more mercury in the breast milk than they would from a flu shot. But thimerosal has been removed from vaccines whenever possible. Currently, flu vaccine is the only childhood vaccine that contains thimerosal, and there are typically more than an adequate number of thimerosal-free doses of flu vaccine produced for children each year.

5. I've also heard negative remarks about aluminum in vaccines. What vaccines contain aluminum, and are the amounts harmful? Is it possible to get these vaccines without aluminum?

Alum is an adjuvant. Most vaccines contain alum. Adjuvants are used to help our bodies create a better immune response to vaccines, making the vaccines more effective. Without an adjuvant, children may need more shots or have lower immunity to the infections. Alum has been used in vaccines for over 75 years and has been found to be safe. We routinely ingest aluminum. For example, a quart of infant formula contains approximately the same amount of aluminum as vaccines.

6. Some parents are opting not to have their children vaccinated. What are the benefits/risks of this?

Immunization rates in the US are at an all-time high, and to keep our children healthy, it is important to continue to

vaccinate. To date, throughout the world, only one disease (smallpox) has been eradicated. We are close to eradicating polio, and cases of measles have been greatly diminished. However, outbreaks of both infections have occurred in the last few years due to not immunizing children. Cases of measles, mumps and whooping cough have increased in the US, occurring overwhelmingly in unimmunized children. So, parents choosing not to immunize their children are putting them at risk of getting infections that are far more serious than the risks associated with the vaccines.

7. Some parents are opting to delay their child's vaccinations or delay certain vaccinations (such as hepatitis B). What are the benefits/risks of this?

There is strong evidence showing that children who have immunizations delayed are less likely to ever "catch up." Despite the recent publicity, there is no known benefit from delaying vaccination and no increased risk of receiving multiple vaccines at one time. Delaying hepatitis B vaccination is known to be risky. A few years ago there was a shortage of hepatitis B vaccine, and some practitioners elected to delay the first dose of the vaccine to infants. At least two infants developed hepatitis B and died due to this practice. Before routine hepatitis B vaccination, approximately 16,000 children under 10 years of age became infected with hepatitis B after non-sexual, person-to-person contact.

8. There has been speculation that recent outbreaks in some cities, such as measles, are a direct reaction to parents not vaccinating their children. Do you agree with this, and if so, what could this mean for the

future if more and more parents are choosing not to vaccinate?

It is not speculation. As mentioned above, smallpox is the only disease to have been eradicated from the world. Multiple examples can be cited regarding the consequences of not vaccinating, including large-scale outbreaks of pertussis (whooping cough) in Britain and Japan and an epidemic of polio in sub-Saharan Africa. Our ability to transport someone around the globe in under a day means anyone could be exposed to any infection before the contagious person even begins to show symptoms. "Hiding" in the US is therefore not a viable option. Immunizations are needed to keep our children safe.

9. Some parents are opting to space out/delay their child's vaccinations, many choosing Dr. Sears alternative vaccine schedule, as detailed in his book, *The Vaccine Book*. Is there any risk to this?

There is NO science to the recommendations made by Dr. Sears, and in fact, his recommendations, while likely well-intentioned, put children at risk. Sears describes two alternative vaccine schedules. One is designed for parents who want to refuse or delay vaccines. This schedule potentially could result in children not receiving measles, mumps, rubella, hepatitis A or chickenpox vaccines, as well as not receiving polio or flu vaccines. The other schedule, for parents who want to space out vaccines, would result in children not receiving flu vaccine until five years of age (even though it is well proven that children between 6 months and 2 years of age have hospitalization rates for flu equivalent to the elderly and over 50 children died last year of the infection).

10. If parents want their child to be fully vaccinated but choose to space them out, what would be an ideal schedule to you?

I would not recommend such a schedule. At the very least, such a schedule will increase the time the child is susceptible to preventable infections. Additionally, a schedule that requires more visits over a longer period will almost assuredly result in a greater number of children who are under-immunized.

11. What sources would you recommend to a new parent wanting to learn more about vaccines?

There are a number of excellent web sites to provide parents information about vaccines. These include the AAP (www.aap.org), the CDC (www.cdc.gov) which has information on all vaccines, including the routine childhood immunizations, the Vaccine Education Center at The Children's Hospital of Philadelphia (www.vaccine.chop.edu) and the Immunization Action Coalition (www.immunize.org).

12. What advice do you have for parents who want to make the vaccination process easier (calmer, less pain, less scary)?

Parents should ask questions of their practitioner and read the handouts that are given prior to the vaccines. Parents need to know they are doing the right thing by immunizing their children. Any momentary pain of the shot will be replaced by the knowledge that they have given the life-saving protection provided by vaccines.