Vaccine Safety:

Responding to Parents' **Top 10** Concerns

1. Are Vaccines safe?

Yes. Millions of children and adults have been vaccinated safely. While any medication, even foods, can cause reactions, a child takes a much greater risk of getting a disease if he or she is not vaccinated. The most common vaccine side effects are mild and include swelling, tenderness, and fever. Set realistic expectations by acknowledging that vaccines cause mild, self-limited reactions, like injection site swelling and pain, in many children. A pain reliever may help, but parents should call the office if concerned. Serious reactions are very rare and can occur in about 1 or 2 people per million shots given.

Scientists and doctors are very careful about the way we test and use vaccines. We also vaccinate our own kids. That's because we know that thousands of people participate in clinical trials to test vaccines before they can be approved by the Food and Drug Administration (FDA). Even after licensing, the Vaccine Adverse Events Reporting System (VAERS) tracks any adverse reaction that could be associated with a vaccine. Newer vaccines like HPV (Gardasil®) are tracked closely. Continued monitoring helps ensure that vaccines have a safe track record over time.

2. Why do children today need so many immunizations?

To save lives. Advances in medical science have developed vaccines to protect us against more than 15 dangerous diseases. Only a few years ago vaccines prevented just a small handful of diseases. Babies are especially vulnerable. Children under age one (still too young to get some shots like varicella) are at high risk of hospitalization or serious complications from vaccine-preventable diseases. These include seizures, brain damage, blindness, and even death. That's why we have continued to develop new vaccines. And, that's the reason children get more immunizations today than in the past.

3. Are diseases of the "old days" really still something to worry about?

Vaccine-preventable diseases still occur—though many young parents haven't seen them. This is due to the success of our country's immunization program. But unvaccinated children (and adults) are still at-risk for common illnesses like influenza, whooping cough, and chicken pox. Some parents may be surprised to learn that before the chicken pox vaccine, almost 11,000 Americans had to be hospitalized, and over 100 died, each year from

chicken pox. Pertussis has been on the rise in California in recent years. Children can stay sick for a week or more, may need to be hospitalized, and could even die if complications develop. Less common diseases like Hib, measles, and mumps happen unexpectedly and can spread quickly. Meningococcal disease can cause blindness, limb amputations, brain damage, and death.

Many diseases no longer common in the US are only a plane ride away. Measles and mumps are common in Europe. Rubella still occurs worldwide. Diphtheria is a problem in Russia and former Soviet countries. Hepatitis is in Africa, much of Asia, the Philippines, and certain parts of the Caribbean. Polio is still seen in South Asia, Africa, and the Middle East.

Recent outbreaks:

- In 2008, San Diego had a measles outbreak when one unvaccinated child became infected in Switzerland and then spread it to siblings, classmates, and even children at the doctor's office. Only unvaccinated kids got ill. Dozens of exposed children also had to miss school and be quarantined at home for weeks.
- In 2008, a pertussis outbreak affected a school in Contra Costa County. About 20 kids got sick. Others had to be quarantined at home for 3 weeks. Pertussis outbreaks continue in many California communities.
- In a 2006 outbreak in the Midwest, over 5,000 people, mainly teens and young adults, developed mumps. Many people were exposed in school settings or came in contact with the disease during air travel.

4. What about holistic medicine or "natural immunity"?

Many holistic medicines have beneficial effects but they do not provide immunity to diseases prevented by vaccines. Before vaccines were widely available, millions of children became ill with pertussis, measles, mumps, and other diseases every year. Most vaccines are over 99% effective in preventing illness.

Some people believe that having the disease is the "natural" way to trigger the body's immune response. Vaccines work the same way—they trigger an immune response—but do not cause disease. Vaccine immunity **is** natural immunity. According to Dr. Andrew Weill, a supporter of holistic medicine, "*...Immunization facilitates a natural process by stimulating encounters between the body's immune system and killed or weakened viruses and bacteria (or pieces and products of them).*" Building immunity from the real disease can be dangerous because it means getting sick, which can have serious complications, even permanent disability or death.

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

Yes. The human immune system deals with hundreds of viruses and bacteria during everyday activities like eating and playing. Therefore, vaccines are only a small drop in the bucket compared to what an infant's immune system faces every day. If vaccines overwhelmed or weakened the immune system, one would expect lesser immune responses when vaccines are given at the same time as compared with when they are given at different times. In contrast, many studies have demonstrated similar immune responses whether multiple vaccines are given together or separately.

Today's vaccines are more refined than in the past. Even though kids get more shots than in the past, they contain far fewer antigens than in the past.

For example, the old whole-cell pertussis vaccine had over 3,000 antigens, while today's acellular formulation has only up to five.

6. What about getting shots later or more spread out?

There is no proof that delaying vaccines or stretching out the recommended schedule is any safer. Young children and babies are the most likely to get very sick or die if they get certain diseases. That's why many shots are given so young and why most pediatricians support the regular childhood immunization schedule.

Understand that it's a parent's role to worry about their children. If they want to delay shots, you may choose to have them sign a declination form to document that they understand the increased risks of their choice to wait. Some parents (and physicians) prefer to limit the number of shots in one visit. If shots are deferred, you should plan how to "catch up" with additional shots later. Reminder systems are a good strategy to help ensure that the child comes back later to finish the series.

7. Do vaccines cause autism?

No. Autism has been increasing around the world for many years. In fact, autism rates are the same in vaccinated and unvaccinated children. No one knows yet what causes autism. Researchers are looking at genetic and environmental factors. Doctors are very concerned and want to find the cause and the cure. What we do know at this point is that children tend to start autistic symptoms at about the same age that they get their immunizations. This can make them seem related, but vaccines have not been shown to be the underlying cause. Reputable information for parents can be found at Autism Speaks and the Organization for Autism Research.

Twenty-three studies have tested hundreds of thousands of children and found no link between autism and the MMR vaccine. The study that first suggested a connection back in 1998 was retracted by ten of its authors in 2004 and has been discredited. The American Medical Association, American Academy of Pediatrics, Institute on Medicine, and the World Health Organization have all issued statements saying that there is no connection between vaccines and autism.

8. What about kids with rare disorders like mitochondrial disease?

Mitochondrial disease, a rare disorder, has been in the news recently. A federal claims court has been examining whether symptoms of brain injury and autism in a girl with mitochondrial disease may have been related to her vaccinations. The child's family has discussed her case with the press, but as of September 2008, the court has not yet issued its rulings or documents on her case.

The important question is: Should a child with mitochondrial disease be vaccinated? According to mitochondrial disease specialists, the answer is **yes**. Illnesses prevented by vaccines, such as measles, mumps, or chicken pox, are especially dangerous to children with mitochondrial disease.

9. What about thimerosal (or mercury) in vaccines?

Thimerosal was removed from all routine child vaccines in 2001 (except some types of influenza vaccine) as a way to reduce mercury exposure to children from all sources. Thimerosal is a preservative containing ethylmercury that prevents vaccine vial contamination. Some people worry that mercury exposure from vaccines could be

dangerous. However, no reliable study has found any link between thimerosal in vaccines and autism or other developmental diseases. A recent study of children with autism in California indicates that the prevalence of autism in children 3 years and older has increased despite the fact that levels of thimerosal in vaccines have *decreased* markedly.

By California law, vaccines with more than "trace" thimerosal cannot be given to any child under age three or pregnant women. "Trace" means that the thimerosal used in manufacturing is removed at the end, leaving a tiny residual amount (1 microgram, compared to 25 or 50). Only some flu vaccines for adults and older children still use thimerosal. Patients may ask for a thimerosal-free flu vaccine.

10. What about other vaccine ingredients?

There is no evidence that vaccine ingredients are harmful. They are used in tiny amounts for very specific purposes. See below for more information.

- **Aluminum:** Aluminum in vaccines is used as an adjuvant to trigger the body's immune response to a disease. There is no information to support that aluminum is dangerous in vaccines. Aluminum is common in food and drinks including fruit and vegetables—even breast milk and infant formula. It's also in antacids, antiperspirants, cooking pots, and soda cans. According to the Children's Hospital of Philadelphia, by age six months, an on-schedule infant would have 4.4 milligrams of aluminum from vaccines, compared to 7 milligrams from breast milk. Formula-fed babies ingest 38 milligrams and the those drinking soy-based formulas get the most —nearly 117 milligrams of aluminum.
- **Formaldehyde** is used in tiny amounts in some vaccines to prevent microbial contamination. Formaldehyde is in the environment and is also a naturally occurring byproduct of the body's metabolism.
- **False claims:** Vaccines **do not** contain anti-freeze, chick embryos, or monkey kidneys; this is false information.

Connect parents with credible immunization resources.

Our companion fact sheet for parents can be offered as a handout during an office visit. Find it at www.immunizeCA.org. On the parent handout, we list these trusted websites for parents who are looking for additional information.

American Academy of Pediatrics
www.cispimmunize.org

National Network for Immunization
www.immunizationinfo.org

Thimerosal FAQs
www.fda.gov/CBER/vaccine/thimerosal.htm

Do Vaccines Cause That? (Book)
www.i4ph.org

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

Parents of Kids with Infectious Diseases
www.pkids.org

The California Immunization Coalition (CIC) is a non-profit, public-private partnership dedicated to achieving and maintaining full immunization protection to promote health and prevent serious illness across the life span.

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