Background

Parents, patients, and healthcare professionals all have misconceptions about vaccinations.

• More patients and parents are questioning the safety and effectiveness of vaccines. Your responses to them require knowledge, tact, and time.

• Healthcare providers can miss opportunities to vaccinate by believing false contraindications and following unnecessary rules.
Vaccine hesitancy, reluctance or refusal to be vaccinated to have one's children vaccinated, is identified by the World Health Organization one of the top ten global health threats of 2019. Arguments against vaccination are contradicted by overwhelming scientific consensus about the safety and efficacy of vaccines.

Hesitancy results from public debates around the medical, ethical and legal issues related to vaccines. It has existed since the invention of vaccination, and pre-dates the coining of the terms "vaccine" and "vaccination" by nearly 80 years. The specific hypotheses raised by anti-vaccination advocates have been found to change over time.[7] Hesitancy often results in disease outbreaks and deaths from vaccine-preventable diseases.

Bills for mandatory vaccination have been considered for legislation, including California Senate Bill 277 Australia's 'No Jab No Pay', all of which have been strenuously opposed by anti-vaccination activists.[14][15][16] To mandatory vaccination be based on anti-vaccine sentiment, or concern that it violates civil liberties reduces public trust in vaccination.
Talking about vaccines

• **Effective, empathetic communication** is critical in responding to parents who are considering not vaccinating their children
  – *Parents* should be helped to feel comfortable voicing any concerns or questions they have about vaccination
  – *Providers* should be prepared to listen and respond effectively

“A successful discussion about vaccines involves a two-way conversation, with both parties sharing information and asking questions.”

*Talking with Parents about Vaccines for Infants* (CDC)

Ask questions

- **Evaluate** whether the child has a valid contraindication to a vaccine by asking about medical history, allergies, and previous experiences.

- **Assess** the parent’s reasons for wanting to delay or forgo vaccination in a non-confrontational manner:
  - Have they had a bad experience?
  - Obtained troubling information?
  - Do they have a religious or personal belief that they think conflicts with vaccination?
Countering Vaccine Hesitancy

Kathryn M. Edwards, MD, Jasse M. Hackell, MD, THE COMMITTEE ON INFECTIOUS DISEASES, THE COMMITTEE ON PRACTICE AND AMBULATORY MEDICINE

Immunizations have led to a significant decrease in rates of vaccine-preventable diseases and have made a significant impact on the health of children. However, some parents express concerns about vaccine safety and the necessity of vaccines. The concerns of parents range from hesitancy about some immunizations to refusal of all vaccines. This clinical report provides information about addressing parental concerns about vaccination.

INTRODUCTION

Immunizations have had an enormous impact on the health of children, and the prevention of disease by vaccination is one of the single greatest public health achievements of the last century. However, over the past decade acceptance of vaccines has been challenged by individuals and groups who question their benefit. Increasing numbers of people are requesting alternative vaccination schedules, or postponing or declining vaccination. In a national telephone survey of 1,500 parents of children 6 to 23 months of age conducted in 2010 with a response rate of 46%, approximately 38% of respondents had refused all vaccines and 19.4% had refused or delayed at least 1 of the recommended childhood vaccines. A study conducted in a metropolitan area of Oregon reported that rates of alternative immunization schedule usage have increased nearly fourfold in recent years, and in some parts of the country the use of "personal belief exemptions" from vaccinations has grown to rates in excess of 5% of the school-aged population.

The Periodic Survey of Fellows (PS#66) conducted by the American Academy of Pediatrics (AAP) in 2006 revealed that 75% of pediatricians surveyed had encountered parents who refused a vaccine, and a follow-up survey in 2013 (PS#84) revealed that this figure had increased to 87% of pediatricians. According to the survey, pediatricians stated that the proportion of parents who refused 1 or more vaccines increased from 9.1% to 16.7% during the 7-year interval between surveys. Physicians stated that the most common reasons parents refused vaccines were that they believed that vaccines are unnecessary (which showed an increase over the 7-year span) and that they had concerns.
**TABLE 1** Categorization of Parental Attitudes Toward Vaccines⁴²,¹⁴

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunization advocate</td>
<td>Parents agree that vaccines are necessary and safe. Parents have a strong relationship with their health care provider.</td>
</tr>
<tr>
<td>Go along to get along</td>
<td>Parents do not question vaccines, would like to vaccinate their children, but may lack a detailed knowledge of vaccines.</td>
</tr>
<tr>
<td>Cautious acceptor</td>
<td>Parents may have minor concerns about vaccines but ultimately vaccinate their children.</td>
</tr>
<tr>
<td>Fence-sitter</td>
<td>Parents have significant concerns about vaccines and tend to be knowledgeable about vaccines. Parents may vaccinate their child or may refuse or delay vaccines. Parents may have significant concerns about vaccines and may have a neutral relationship with their health care provider.</td>
</tr>
<tr>
<td>Refuser</td>
<td>Parents refuse all vaccines for their child. Their reasons for refusal may include distrust in the medical system, safety concerns, and religious beliefs.</td>
</tr>
</tbody>
</table>
Dialogue

• If parents have safety concerns or misconceptions about vaccination, ask them to identify the source(s) of those concerns or beliefs

• Listen carefully, paraphrase to the parent what they have told you, and ask them if you have correctly interpreted what they have said

• Provide factual information in understandable language that addresses the specific concerns or misconceptions the parent has about vaccination
Tetanus: This baby has neonatal tetanus. His body is rigid. Infection can occur when the newly cut umbilical cord is exposed to dirt, as can occur in a developing country. Most newborns who get tetanus die. Neonatal tetanus can be prevented by hygienic delivery practices, and/or by immunizing mothers against tetanus.

*Photo courtesy of the Centers for Disease Control and Prevention (CDC)*
Human Papillomavirus (HPV): HPV is the most common sexually transmitted infection in the United States. Approximately 79 million American are infected with HPV. Most sexually-active men and women will get at least one type of HPV at some point in their lives.

Persistent infection with high-risk types of HPV is associated with almost all cervical cancers. An estimated 29,600 HPV-associated cancers occur annually in the U.S.

*Photo courtesy of the Centers for Disease Control and Prevention (CDC)*
Pertussis: This child has pertussis (whooping cough). He has severe coughing spasms, which are often followed by a “whooping” sound. It is difficult for him to stop coughing and catch his breath.

Babies are the most likely to die from pertussis and can have complications such as seizures and brain damage.
Polio: This 1952 photo of a Los Angeles hospital respiratory ward shows polio victims in iron lungs — machines which were necessary to help victims breathe.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)
Measles: This child has a severe measles rash. He has red eyes, a runny nose, and a fever.

Measles can cause pneumonia, seizures, brain damage, and even death. Death from measles occurs in 2 to 3 per 1,000 reported cases in the U.S.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)
**MYTH: MMR causes autism**

- Many large, well-designed studies have found no link between MMR and autism.
- Autism usually becomes apparent around the same time MMR is given – no evidence of causality.
- Autism probably has multiple components, including genetics (e.g., one study found that if one identical twin had autism, the chance that the second twin had autism was greater than 90%, but with fraternal twins the chance was less than 10%).
**MYTH: MMR causes autism (cont.)**

- The 1998 study by Andrew Wakefield that started this concern was based on 12 children who were preselected for study.
- In 2004, 10 of the 13 authors of this study retracted the study’s interpretation.
MYTH: MMR causes autism (cont.)

• On 2/2/2010, the editors of The Lancet retracted the paper following the ruling of the U.K.’s General Medical Council that stated the primary author’s conduct regarding his research was “dishonest” and “irresponsible” and that he had shown a “callous disregard” for the suffering of children involved in his studies. Wakefield was subsequently removed from the U.K medical register and is no longer licensed to practice medicine.

• In January 2011, the BMJ published a series of articles showing Wakefield’s work was not just bad science, but deliberate fraud.
References

- IAC’s “Clear Answers & Smart Advice about Your Baby’s Shots” by Ari Brown, MD, FAAP www.immunize.org/catg.d/p2068.pdf
- CDC’s “Measles, Mumps, and Rubella (MMR) Vaccine Safety Studies” www.cdc.gov/vaccinesafety/vaccines/mmr/mmr-studies.html
- The Fraud Behind the MMR Scare (*IAC web section*) www.immunize.org/bmj-deer-mmr-wakefield
- IOM Report: “MMR Vaccine and Autism” www.nap.edu/read/10101/chapter/1
MMR Vaccine Does Not Cause Autism
Examine the evidence!

There is no scientific evidence that MMR vaccine causes autism. The question about a possible link between MMR vaccine and autism has been extensively reviewed by independent groups of experts in the United States, including the National Academy of Sciences’ Institute of Medicine (now renamed the National Academy of Medicine). These reviews have concluded that the available epidemiologic evidence does not support a causal link between MMR vaccine and autism.

The suggestion that MMR vaccine might lead to autism had its origins in gastroenterology research by Andrew Wakefield in the United Kingdom. In 1998, Wakefield and colleagues published an article in The Lancet claiming that the measles virus in MMR caused inflammatory bowel disease, allowing harmful proteins to enter the bloodstream and damage the brain. The validity of this finding was later called into question when it could not be reproduced by other researchers. In addition, the findings were further discredited when an investigation found that Wakefield did not disclose he was being funded for his research by lawyers seeking evidence to use against vaccine manufacturers. As a result, Wakefield was permanently barred from practicing medicine in the United Kingdom and The Lancet retracted the original article in 2010.


The following list of articles published in peer-reviewed journals is provided so that parents and practitioners can themselves compare the balance of evidence about MMR vaccine and autism.

More than 25 articles refute a connection between MMR vaccine and the development of autism

1. Measles, Mumps, Rubella Vaccination and Autism – A Nationwide Cohort Study. Hvid A et al. Ann Intern Med 2019; 170(8):513-520. This nationwide cohort study included all 657,461 children born 1/1999-12/2010 in Denmark. With this many study participants, the researchers were able to look at vaccinated vs. not vaccinated children, including 6,517 children with a diagnosis of autism.

CONCLUSION: The findings strongly support that MMR vaccination does not increase the risk for autism, does not trigger autism in susceptible children, and is not associated with clustering of autism cases after vaccination.

LINK: www.ncbi.nlm.nih.gov/pubmed/30831578


CONCLUSION: No convincing evidence was found in this study that MMR vaccination and increasing thimerosal doses were associated with an increased risk of ASD onset.

LINK: www.ncbi.nlm.nih.gov/pubmed/25562790

3. Autism Occurrence by MMR Vaccine Status among US Children with Older Siblings with and without Autism. Jain A et al. JAMA 2015;313(15):1534-40. The objective of this study was to investigate Autism Spectrum Disorder (ASD) occurrence by MMR vaccine status in a large sample of US children who have older siblings with and without ASD.

CONCLUSION: In this large sample of privately insured children with older siblings, receipt of the MMR vaccine was not associated with increased risk of ASD, regardless of whether older siblings had ASD. These findings indicate no harmful association between MMR vaccine receipt and ASD even among children already at higher risk for ASD.

LINK: www.ncbi.nlm.nih.gov/pubmed/25889051


CONCLUSION: Vaccination is not associated with the development of autism or autism spectrum disorder (ASD). Furthermore, the components of the vaccines (thimerosal or mercury) or multiple vaccines (MMR) are not associated with the development of autism or ASD.

LINK: www.ncbi.nlm.nih.gov/pubmed/24814559

CONCLUSION: Our findings suggest that MMR vaccination is not associated with an increased risk of pervasive developmental disorders.

LINK: www.ncbi.nlm.nih.gov/pubmed/15364187


CONCLUSIONS: Similar proportions of case and control children were vaccinated by the recommended age or shortly after (i.e., before 18 months) and before the age by which atypical development is usually recognized in children with autism (i.e., 24 months). Vaccination before 36 months was more common among case children than control children, especially among children 3 to 5 years of age, likely reflecting immunization requirements for enrollment in early intervention programs.

LINK: www.ncbi.nlm.nih.gov/pubmed/14754396


CONCLUSIONS: The prevalence of autism, which was apparently rising from 1979 to 1992, reached a plateau from 1992 to 1996 at a rate of some 2.6 per 1000 live births. This leveling off, together with the reducing age at diagnosis, suggests that the earlier recorded rise in prevalence was not a real increase but was likely due to factors such as increased recognition, a greater willingness on the part of educationists and families to accept the diagnostic label, and better recording systems. The proportion of parents attributing their child’s autism to MMR appears to have increased since August 1997.

LINK: www.ncbi.nlm.nih.gov/pubmed/12876138


CONCLUSIONS: This study provided strong evidence against the hypothesis that MMR vaccination causes autism.

LINK: www.ncbi.nlm.nih.gov/pubmed/12021859


CONCLUSIONS: We did not identify any association between MMR vaccination and encephalitis, aseptic meningitis, or autism.

LINK: www.ncbi.nlm.nih.gov/pubmed/12145036


CONCLUSIONS: No evidence was found that children with autism were more likely than children without autism to have had prior gastrointestinal disorders at any time before their diagnosis of autism.

LINK: www.ncbi.nlm.nih.gov/pubmed/12193358


CONCLUSIONS: These findings provide no support for an MMR associated “new variant” form of autism with developmental regression and bowel problems, and further evidence against involvement of MMR vaccine in the initiation of autism.

LINK: www.ncbi.nlm.nih.gov/pubmed/11850369


CONCLUSIONS: No evidence was found to support a distinct syndrome of MMR-induced autism or of “autistic enterocolitis.” These results add to the recent accumulation of large-scale epidemiologic studies that failed to support an association between MMR and autism at population level. When combined, the current findings do not argue for changes in current immunization programs and recommendations.

LINK: www.ncbi.nlm.nih.gov/pubmed/11381466


CONCLUSIONS: These data do not suggest an association between MMR immunization among young children and an increase in autism occurrence.

LINK: www.ncbi.nlm.nih.gov/pubmed/11231748


CONCLUSIONS: Because the incidence of autism among 2 to 5 year olds increased markedly among boys born in each year separately from 1988 to 1993 while MMR vaccine coverage was over 95% for successive annual birth cohorts, the data provide evidence that no correlation exists between the prevalence of MMR vaccination and the rapid increase in the risk of autism over time. The explanation for the marked increase in risk of the diagnosis of autism in the past decade remains uncertain.

LINK: www.ncbi.nlm.nih.gov/pubmed/11222420


CONCLUSIONS: Our analyses do not support a causal association between MMR vaccine and autism. If such an association occurs, it is so rare that it could not be identified in this large regional sample.

LINK: www.ncbi.nlm.nih.gov/pubmed/10376617

CONCLUSION: Exposure to the MMR vaccine was unlikely to be associated with autism, asthma, leukocytosis, red fever, type 1 diabetes, guilt disturbance, Crohn's disease, demyelinating diseases, bacterial or viral infections.

link: ncbi.nlm.nih.gov/published/22333603


CONCLUSION: Evidence favors rejection of five vaccine adverse event relationships, including MMR vaccine and autism. Overall, the committee concludes that few health problems are caused by or clearly associated with vaccines.


7. Lack of Association Between Measles-Mumps-Rubella Vaccination and Autism in Children: A Case-Control Study. Mozek-Dudyn D et al. Pediatr Infect Dis J. 2010;29(5):397-400. The 96 cases with childhood or typical autism, aged 2 to 15, were included in the study group. Controls consisted of 183 children individually matched to cases by year of birth, sex, and general practitioners.

CONCLUSION: The study provides evidence against the association of autism with either MMR or a single measles vaccine.

link: ncbi.nlm.nih.gov/published/19932919


CONCLUSION: No association between measles vaccination and ASD was shown.

link: ncbi.nlm.nih.gov/published/18132575


CONCLUSION: This study provides strong evidence against association of autism with persistent Mumps virus RNA in the GI tract or MMR exposure.

link: ncbi.nlm.nih.gov/published/17849350


CONCLUSION: Our literature review found very few studies supporting this theory, with the overwhelming majority showing no causal association between the Measles-Mumps-Rubella vaccine and autism.

link: ncbi.nlm.nih.gov/published/17268158


CONCLUSION: There is no evidence of measles virus in peripheral blood mononuclear cells of children with autism spectrum disorder.

link: ncbi.nlm.nih.gov/pubmed/17015560


CONCLUSION: During the period of MMR usage no significant difference was found in the incidence of regression between MMR vaccinated children and non-vaccinated children. Among the proportion and incidence of regression across the three MMR-program-related periods (before, during and after MMR usage), no significant difference was found between those who had received MMR and those who had not. Moreover, the incidence of regression did not change significantly across the three periods.

link: ncbi.nlm.nih.gov/pubmed/16865547


CONCLUSION: The findings ruled out an association between pervasive developmental disorder and either high levels of thimerosal exposure comparable with those experienced in the United States in the 1990s or 1-2 mumps-mumps-rubella vaccinations.

link: ncbi.nlm.nih.gov/pubmed/16818529


CONCLUSION: There was no evidence that onset of autistic symptoms or of regression was related to measles-mumps-rubella vaccinations.

link: ncbi.nlm.nih.gov/pubmed/16729252


CONCLUSION: Based upon the current literature, it appears that there is no relationship between MMR vaccination and the development of autism.

link: ncbi.nlm.nih.gov/pubmed/15173555


CONCLUSION: The committee concludes that the body of epidemiological evidence favors rejection of a causal relationship between the MMR vaccine and autism.

link: ncbi.nlm.nih.gov/pubmed/16729252

continued on the next page
References (cont.)

• IAC’s “Evidence Shows Vaccine Unrelated to Autism”
  www.immunize.org/catg.d/p4028.pdf
• IAC’s “Decisions in the Omnibus Autism Proceeding”
  www.immunize.org/catg.d/p4029.pdf
• VEC’s “Vaccines and Autism: What you should know”
• CDC’s “Understanding MMR Vaccine Safety”
• “Vaccines and Autism: A Tale of Shifting Hypotheses”
  by Paul Offit, MD and Jeffery Gerber, MD
  http://cid.oxfordjournals.org/content/48/4/456.full
References (cont.)

• “Fitness to Practice Panel Hearing” report from the U.K’s General Medical Council regarding Dr. Andrew Wakefield
  www.neurodiversity.com/wakefield_gmc_ruling.pdf

• *The Lancet* retraction
  www.thelancet.com/journals/lancet/article/PIIS0140-6736(97)11096-0/abstract

• “How a zealot’s word led us astray on autism” by Arthur Caplan, PhD
  www.msnbc.msn.com/id/35218819/ns/health-health_care

• AAP’s “Vaccine Safety: Examine the Evidence”
MYTH: Giving an infant multiple vaccines can overwhelm the immune system

- Babies begin being exposed to immunological challenges immediately at the time of birth. As babies pass through the birth canal and breathe, they are immediately colonized with trillions of bacteria, which means that they carry the bacteria in their bodies but aren’t infected by them. Healthy babies constantly make antibodies against these bacteria and viruses.
**MYTH**: Giving an infant multiple vaccines can overwhelm the immune system (cont)

- Vaccines use only a tiny proportion of a baby’s immune system’s ability to respond; though children receive more vaccines than in the past, today’s vaccines contain fewer antigens (e.g., sugars and proteins) than previous vaccines. Smallpox vaccine alone contained 200 proteins; the 14 currently recommended routine vaccines contain fewer than 150 immunologic components.
References

• VEC’s “Too Many Vaccines? What you should know”

• FAQs about Multiple Vaccinations and the Immune System
  www.cdc.gov/vaccinesafety/Vaccines/multiplevaccines.html

• “Vaccines and Autism: A Tale of Shifting Hypotheses” by Paul Offit, MD and Jeffery Gerber, MD
  http://cid.oxfordjournals.org/content/48/4/456.full
MYTH: It’s better to space out vaccines using an alternative schedule

• Delaying vaccines increases the time children will be susceptible to diseases
  • In 2014, there were 665 cases of measles reported in the U.S. The majority of people who got measles were unvaccinated. Measles is still common in many parts of the world, including some countries in Europe, Asia, the Pacific, and Africa, and can easily be transported.
  • In 2014, 32,971 cases of pertussis were reported to CDC, and many more cases were undiagnosed.

• Requiring many extra appointments for vaccination increases the stress for the child and may lead to a fear of visits to the clinic.

• There is no evidence that spreading out the schedule decreases the risk of adverse reactions.
References

• “The Problem With Dr. Bob’s Alternative Vaccine Schedule” by Paul Offit, MD and Charlotte Moser
  http://pediatrics.aappublications.org/content/pediatrics/123/1/e164.full.pdf

• AAP’s “The Childhood Immunization Schedule: Why Is It Like That?”

• VEC’s “Too Many Vaccines? What you should know”

• IOM Report: “Multiple Immunizations and Immune Dysfunction”
  www.nap.edu/read/10306/chapter/1

• “Parental Refusal of Pertussis Vaccination is Associated with an Increased Risk of Pertussis Infection in Children” Gianz et al
  http://pediatrics.aappublications.org/content/123/6/1445.abstract
MYTH: Natural infection is better than immunization

• Natural infection usually does not cause better immunity than vaccination.

• However, the price paid for natural disease can include:
  • paralysis
  • permanent brain damage
  • liver failure
  • liver cancer
  • deafness
  • blindness
  • loss of limbs
  • death
References

• “Natural Infection vs. immunization” by Paul Offit, MD
  www.chop.edu/centers-programs/vaccine-education-center/vaccine-safety/immune-system-and-health

• Photos of people with vaccine-preventable diseases
  www.immunize.org/photos

• Real-life accounts of people who have suffered or died from vaccine-preventable diseases
  www.immunize.org/reports
MYTH: Thimerosal causes autism

• The form of mercury found in thimerosal is ethylmercury (EM), not methylmercury (MM). MM is the form that has been shown to damage the nervous system.

• Although no evidence of harm has ever been demonstrated, thimerosal was taken out of vaccines as a precaution, and “because it can be” (due to single dose vials).

• Since 2001, with the exception of a few influenza vaccine products, thimerosal has not been used as a preservative in any routinely recommended childhood vaccines.
MYTH: Thimerosal causes autism (cont)

• Multiple studies have shown that thimerosal in vaccines does not cause autism when comparing children who received thimerosal-containing vaccines and those who received vaccines not containing thimerosal.

• Studies of three countries compared the incidence of autism before and after thimerosal was removed from vaccines (in 1992 in Europe and 2001 in the U.S.). There was no decrease in autism with the switch to thimerosal-free vaccines.
References

• CDC’s Vaccine Safety Concerns web page
  www.cdc.gov/vaccinesafety/concerns

• IAC’s collection of thimerosal-related resources
  www.immunize.org/thimerosal

• Institute of Medicine reports on thimerosal
  www.nap.edu/books/030909237X/html and
  www.nap.edu/read/10208/chapter/1

• CDC’s “Understanding Thimerosal, Mercury, and Vaccine Safety”
References (cont.)

• Vaccine Education Center’s (VEC’s) “Thimerosal: What you should know”

• VEC’s “Vaccines and Autism: What you should know”

• CDC’s Studies on Thimerosal in Vaccines
  www.cdc.gov/vaccinesafety/pdf/cdcstudiesonvaccinesandautism.pdf

• “Vaccines and Autism: A Tale of Shifting Hypotheses” by Paul Offit, MD and Jeffery Gerber, MD
  http://cid.oxfordjournals.org/content/48/4/456.full
**MYTH**: Ingredients in vaccines are harmful

**Aluminum**

- Aluminum is used in some vaccines as an adjuvant – an ingredient that improve the immune response. Adjuvants can allow for use of less antigen. They have been used for this purpose for more than 70 years.
- Aluminum is the most common metal found in nature. It is in the air and in food and drink. Infants get more aluminum through breast milk or formula than vaccines.
- Most of the aluminum taken into the body is quickly eliminated.
MYTH: Ingredients in vaccines are harmful (cont.)

Formaldehyde

• Formaldehyde is used to detoxify diphtheria and tetanus toxins or to inactivate a virus.
• The tiny amount which may be left over from these steps in making vaccines is safe.
• Formaldehyde is also found in products like paper towels, mascara, and carpeting.
• Humans normally have formaldehyde in their blood streams at levels higher than is found in vaccines.
MYTH: Ingredients in vaccines are harmful (cont.)

Miscellaneous

• Antibiotics are present in some vaccines to prevent bacterial contamination when the vaccine is made.
• Additives such as gelatin, albumin, sucrose, lactose, MSG, and glycine help the vaccine stay effective while being stored.
• Trying to make vaccines without adjuvants, additives, and preservatives is difficult – these ingredients keep vaccine safe and effective.
References

• VEC’s “Aluminum in Vaccines: What you should know”

• VEC’s “Vaccine Ingredients: What you should know”

• IAC’s “Adjuvants and Ingredients” web section
  www.immunize.org/concerns/adjuvants.asp

• AAP’s “Questions and Answers about Vaccine Ingredients”
References (cont.)

• CDC’s “Vaccine Excipient & Media Summary, by Excipient”

• CDC’s “Ingredients of Vaccine – Fact Sheet”
  www.cdc.gov/vaccines/vac-gen/additives.htm

• IAC’s Package Inserts web section
  www.immunize.org/fda
Example: Measles
Example: *Haemophilus influenzae* type b

*Rate per 100,000 children <5 years of age
## Vaccines Work!

CDC statistics demonstrate dramatic declines in vaccine-preventable diseases when compared with the pre-vaccine era

<table>
<thead>
<tr>
<th>Disease</th>
<th>Pre-Vaccine Era Estimated Annual Morbidity(^1)</th>
<th>Most Recent Reports or Estimates of U.S. Cases</th>
<th>Percent Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria</td>
<td>21,053</td>
<td>1(^2)</td>
<td>&gt;99%</td>
</tr>
<tr>
<td><em>H. influenzae</em> (invasive, &lt;5 years of age)</td>
<td>20,000</td>
<td>33(^3)</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>117,333</td>
<td>4,000(^5)</td>
<td>97%</td>
</tr>
<tr>
<td>Hepatitis B (acute)</td>
<td>66,232</td>
<td>20,900(^6)</td>
<td>68%</td>
</tr>
<tr>
<td>Measles</td>
<td>530,217</td>
<td>273(^3)</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>Meningococcal disease</td>
<td>2,868(^7)</td>
<td>346(^5)</td>
<td>88%</td>
</tr>
<tr>
<td>Mumps</td>
<td>162,344</td>
<td>2,251(^3)</td>
<td>99%</td>
</tr>
<tr>
<td>Pertussis</td>
<td>200,752</td>
<td>13,439(^8)</td>
<td>93%</td>
</tr>
<tr>
<td>Pneumococcal disease (invasive, &lt;5 years of age)</td>
<td>16,069</td>
<td>1,700(^9)</td>
<td>89%</td>
</tr>
<tr>
<td>Polio (paralytic)</td>
<td>16,316</td>
<td>0(^8)</td>
<td>100%</td>
</tr>
<tr>
<td>Rotavirus (hospitalizations, &lt;3 years of age)</td>
<td>62,500(^7)</td>
<td>30,625(^5)</td>
<td>51%</td>
</tr>
<tr>
<td>Rubella</td>
<td>47,745</td>
<td>5(^5)</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>Congenital Rubella Syndrome</td>
<td>152</td>
<td>0(^2)</td>
<td>100%</td>
</tr>
<tr>
<td>Smallpox</td>
<td>29,005</td>
<td>0(^2)</td>
<td>100%</td>
</tr>
<tr>
<td>Tetanus</td>
<td>580</td>
<td>20(^5)</td>
<td>97%</td>
</tr>
<tr>
<td>Varicella</td>
<td>4,085,120</td>
<td>102,128(^3)</td>
<td>98%</td>
</tr>
</tbody>
</table>

1. CDC JAMA November 14, 2007; 298(18):2135-43.
3. An additional 11 cases of Hib are estimated to have occurred among the 221 notifications of Hib (<1 years) with unknown serotype.
5. CDC, MMWR October 6, 1990; 39(33):1-91.
References

• HHS’s “Vaccine Works”  
  www.vaccines.gov/basics/work/index.html

• CDC’s “What Would Happen if We Stopped Vaccinations?”  
  www.cdc.gov/vaccines/vac-gen/whatifstop.htm

• IAC’s “Personal belief exemptions for vaccination put people at risk. Examine the evidence for yourself.”  
  www.immunize.org/catg.d/p2069.pdf
**MYTH:** Abortions are required to produce vaccines

- It’s true that production of varicella, rubella, rabies, and hepatitis A vaccines involves growing viruses in human cell culture.
- Two human cell lines provide these cultures; they were developed from two legally aborted fetuses in the 1960s.
- The donor fetuses were not aborted for the purpose of obtaining these cells.
- The same cell lines have been used for more than 40 years – no new fetal tissue is required.
References

• IAC’s web page about ethical and religious objections to vaccination
  www.immunize.org/concerns/religious.asp

• Why Were Fetal Cells Used to Make Certain Vaccines?
  www.chop.edu/news/news-views-why-wer-fetal-cells-used-make-
certain-vaccines?utm_term=new+view&utm_content=
vaccine+hesitancy&utm_campaign=vecupdatesApr2017
MYTH: VAERS data prove that vaccines are dangerous

VAERS data cannot “prove” anything.

• Anyone can report anything...not proof of causality is required.
• Only reports of special interest (e.g., hospitalizations) are verified. When checked, many reports are not accurate.
• Reports include many non-serious reactions.
• The number of reported adverse events is influenced by publicity.
• VAERS is properly used to detect early warning signals and generate hypotheses.
References

- Vaccine Adverse Events Reporting Systems (VAERS)
  www.vaers.hhs.gov

- CDC’s Vaccine Safety Monitoring web page
  www.cdc.gov/vaccinesafety/Vaccine_Monitoring/Index.html

- CDC’s “Ensuring the Safety of Vaccines in the United States”
  www.cdc.gov/vaccines/hcp/patient-ed/conversations/downloads/
  vacsafe-ensuring-color-office.pdf

- CDC’s “Understanding the Vaccine Adverse Event Reporting System
  (VAERS)”
  www.cdc.gov/vaccines/hcp/patient-ed/conversations/downloads/
  vacsafe-vaers-color-office.pdf

- WHO’s “Causality assessment of adverse events following
  immunization”
  www.who.int/vaccine_safety/causality/en
Don’t drug companies make big profits from pushing vaccines?

• Vaccines are not high-profit products. Vaccine sales are dwarfed by prescription sales.

• Costs for research, development, and compliance with standards are high, with no guarantee that a vaccine will be licensed.

• If vaccines were highly profitable, why would only a few companies produce almost all of the U.S. childhood vaccines today, when there used to be 25 companies producing vaccines?

• Vaccine manufacturing is a public service.
Isn’t it my right not to vaccinate my child?

• Vaccination laws have been found to be constitutional in U.S. courts. Seminal case was *Jacobson v. Massachusetts* in 1905.

• All states offer medical exemptions.

• Parents need to be aware that if they don’t vaccinate their children, they are putting them, and their contacts, at risk of serious disease.

• Unvaccinated children often have to stay home from school or daycare during outbreaks.
References

• *The Vaccine Enterprise* (*Health Affairs*, May 2005, Supplement)
  [http://content.healthaffairs.org/content/24/3.toc](http://content.healthaffairs.org/content/24/3.toc)

• *Big Pharma Vaccine Profits—The Real Conspiracy* (The Skeptical Raptor’s Blog)

• *Drug versus vaccine investment: a modelled comparison of economic incentives*
  [www.ncbi.nlm.nih.gov/pmc/articles/PMC3846654](www.ncbi.nlm.nih.gov/pmc/articles/PMC3846654)
Good resources FOR PROVIDERS talking to parents and patients

• IAC’s Talking about Vaccines web section
  www.immunize.org/talking-about-vaccines
• IAC’s Responding to Parents web section
  www.immunize.org/talking-about-vaccines/responding-to-parents.asp
• CDC’s Provider Resources for Vaccine Conversations with Parents web section
  www.cdc.gov/vaccines/hcp/conversations
• Vaccine Education Center
  www.chop.edu/centers-programs/vaccine-education-center
• AAP’s immunization website
  www.aap.org/immunization
• National Adult and Influenza Immunization Summit
  www.izsummitpartners.org
Good resources FOR PARENTS

- IAC’s handouts for communicating with parents
  www.immunize.org/handouts/discussing-vaccines-parents.asp
- IAC’s website for the public
  www.vaccineinformation.org
- CDC’s fact sheets on vaccine-preventable diseases for parents
  www.cdc.gov/vaccines/hcp/conversations/prevent-diseases/index.html
- CDC’s “Parents Guide to Childhood Immunization”
  www.cdc.gov/vaccines/pubs/parents-guide
- Vaccine Education Center’s handouts for parents and patients
  www.chop.edu/centers-programs/vaccine-education-center/resources/vaccine-and-vaccine-safety-related-qa-sheets
- Every Child By Two’s websites
  www.ecbt.org and www.vaccinateyourfamily.org
Don’t worry about every possible question

• Be able to recommend good websites and handouts for patients/parents.
• Be aware of major vaccine-critical groups and individuals and become familiar with their websites. For example, the name National Vaccine Information Center sounds official and positive about vaccines, but it is not.
• Be ready to answer the most common questions – many concerns haven’t changed in over 200 years!
• Remember, it’s acceptable to say you’ll look into a question and get back to the patient with more information.
• It’s worth your time – people respect the opinion of their healthcare providers.
Background Resources for Providers

• IAC’s ACIP Recommendations web section
  www.immunize.org/acip

• IAC’s Ask the Experts web section
  www.immunize.org/askexperts

• IAC’s Vaccine Information Statement (VIS) web section
  www.immunize.org/vis

• IAC’s educational materials web section
  www.immunize.org/handouts

• IAC’s “Summary of Recommendations for Adult Immunization”

• IAC’s “Summary of Recommendations for Child/Teen Immunization”
Background Resources for Providers

- ACIP’s “General Best Practice Guidelines for Immunization”
  www.cdc.gov/vaccines/hcp/acip-recs/general-recs/downloads/general-recs.pdf

- CDC’s “Pink Book” (*Epidemiology and Prevention of Vaccine-Preventable Diseases*)
  www.cdc.gov/vaccines/pubs/pinkbook/index.html

- CDC’s “Contraindications and Precautions”
  www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.htm.

- NVAC’s “Standard for Adult Immunization Practice”
  www.cdc.gov/vaccines/hcp/adults/for-practice/standards/index.html
Questions

• Write the CDC experts at nipinfo@cdc.gov
• Write IAC at admin@immunize.org
• Read archived *Ask the Experts Q&As* at www.immunize.org/askexperts
• Subscribe to *IAC Express* for weekly updates on vaccine recommendations, licensures, and resources at www.immunize.org/subscribe
Examining the impact of HPV vaccination

A recent meta-analysis, published in *The Lancet*, examined how human papillomavirus (HPV) vaccination programs have impacted rates of HPV-related diagnoses in the little more than 10 years since vaccination was implemented. Sixty million individuals were included in the review and the 8 years of post-vaccination follow-up data indicate that vaccination has had a substantial impact on reducing HPV infection, CIN2+, and anogenital warts.

For the systematic review, the authors searched MEDLINE and Embase for studies published between February 1, 2014 and October 11, 2018. Eligible studies compared the frequency (prevalence or incidence) of at least one HPV-related endpoint, including genital HPV infection, anogenital wart diagnoses or cervical intraepithelial neoplasia grade 2+ (CIN2+), between pre-vaccination and post-vaccination periods. The studies also had to use the same population sources and recruitment methods before and after vaccination. All analyses were stratified by sex, age, and years since vaccine introduction.

The authors identified 1702 articles that were potentially eligible. Sixty-five articles from 14 high-income countries were included in the final review (23 for HPV infection, 29 for anogenital warts and 13 for CIN2+).

Five to 8 years of vaccination, prevalence of HPV-16 and -18 decreased significantly by 83% (relative risk [RR] 0.17, 95% CI 0.11–0.25) among girls between ages 13 and 19. Among women aged 20 to 24, prevalence decreased by 66% (RR 0.34; 95% CI 0.23–0.49). Although not as significant as HPV-16 and -18, prevalence of HPV-31, 33, and 45 decreased significantly by 54% (RR 0.46; 95% CI 0.33–0.66) among girls aged 13 to 19. Among women aged 20 to 24, the decrease was not significant.

Anogenital wart diagnoses significantly decreased among girls and women aged 15 to 19, 20 to 24, and 25 to 29 in the first 4 years following implementation. Diagnoses 5 to 8 years after implementation also decreased by 67% (RR 0.33; 95% CI 0.24–0.46) among girls aged 15 to 19, by 54% (RR 0.46; 95% CI 0.36–0.60) among women aged 20 to 24, and by 31% (RR 0.69; 95% CI 0.47–0.98) among women aged 25 to 29.

At 5 to 9 years after implementation of vaccination, rates of CIN2+ decreased significantly by 51% (RR 0.49; 95% CI 0.42–0.58) among girls aged 15 to 19 and among women aged 20 to 24, this number decreased by 31% (RR 0.69; 95% CI 0.57–0.84). Among mostly unvaccinated women, CIN2+ significantly increased in women between ages 25 to 29 and 30 to 39, respectively (19% [RR 1.19; 95% CI 1.06–1.32] and 23% [RR 1.23; 95% CI 1.13–1.34]).

The authors believe the results of the meta-analysis reinforce the recently revised position of the World Health Organization to recommend HPV vaccination to multiple age cohorts of girls with the hope that cervical cancer can be eliminated if proper population-level vaccination coverage can be achieved.
Personal belief exemptions for vaccination put people at risk. Examine the evidence for yourself.

Enforcement of mandatory immunization requirements for children entering childcare facilities and schools has resulted in high immunization coverage levels. While all states and the District of Columbia allow exemptions from the requirements for medical reasons, all but three offer exemptions to accommodate religious beliefs, and 18 states allow exemptions based on parents' personal beliefs. Several recent outbreaks of measles, pertussis, and varicella (chickenpox) have been traced to pockets of unvaccinated children in states that allow personal belief exemptions. To understand the impact of vaccine refusal, examine the evidence for yourself.


KEY FINDINGS: The researchers found that more than half of the measles cases (56.8%) occurred in children whose parents refused measles vaccination. In the pertussis studies, many of the cases (24%-45%) in the five largest statewide pertussis outbreaks occurred in unvaccinated or undervaccinated populations. In addition, both the measles and the pertussis outbreaks occurred not only among unvaccinated individuals but also among vaccinated individuals in geographic locations with a high prevalence of vaccine exemptions.


SUMMARY: To update surveillance data on current measles outbreaks, CDC analyzed cases reported during January 4–April 2, 2015. A total of 159 cases were reported during this period; over 80% of the cases occurred among persons who were unvaccinated or had unknown vaccination status.

KEY FINDINGS: A total of 111 of the 159 cases were associated with an outbreak that originated in late December 2014 in Disney theme parks in Orange County, California. Cases associated with this outbreak were reported from seven U.S. states, Mexico, and Canada. Other smaller outbreaks without a link to the Disney outbreak occurred in Illinois (15 cases), Nevada (9), and Washington (3). The majority of the 159 cases were either unvaccinated (71 [45%]) or had unknown vaccination status (60 [38%]; 28 [18%] had received measles vaccine.

LINK: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6414a1.htm


SUMMARY: In March 2011, pertussis was confirmed in a Minnesota child without travel abroad. An investigation was initiated to determine the source, prevent transmission, and examine measles, mumps, and rubella (MMR) vaccine coverage in the affected community.

KEY FINDINGS: Twenty-one measles cases were identified. The median age was 12 months (range, 4 months to 51 years) and 14 (67%) were hospitalized (range, 2-7 days). The source was a 30-month-old U.S.-born child of Somali descent infected while visiting Kenya. Measles spread in several settings, and over 3500 individuals were exposed. Sixteen inpatient patients were unvaccinated; 9 of the 16 were age-eligible; 7 of the 16 had safety concerns and 6 were of Somali descent. MMR vaccine coverage among Somali children declined significantly from 2004 through 2010 starting at 93.1% in 2004 and reaching 54.0% in 2010.

CONTINUED ON THE NEXT PAGE

IMMUNIZATION ACTION COALITION Saint Paul, Minnesota • 651-647-9009 • www.immunize.org • www.vaccineinformation.org www.immunize.org/cct/gp/202002.pdf • Item #20706 (6/16)

**SUMMARY:** Researchers analyzed nonmedical exemptions (NMEs) for children entering kindergarten from 2003 through 2010 and pertussis cases with onset in 2010 in California to determine if NMEs increased in that period, if children obtaining NMEs clustered spatially, if pertussis cases clustered spatially and temporally, and if there was statistically significant overlap between clusters of NMEs and cases.

**KEY FINDINGS:** Previous studies have shown that nonmedical exemptions (NMEs) to immunization cluster geographically and contribute to outbreaks of vaccine-preventable diseases such as pertussis. The 2010 pertussis resurgence in California has been widely attributed to waning immunity from acellular pertussis vaccines. This study provides evidence of spatial and temporal clustering of NMEs and clustering of pertussis cases and suggests that geographic areas with high NME rates were also associated with high rates of pertussis in California in 2010.

**LINK:** [http://pediatrics.aappublications.org/content/early/2013/09/24/peds.2013-0878](http://pediatrics.aappublications.org/content/early/2013/09/24/peds.2013-0878)


**SUMMARY:** CDC evaluated cases reported by 16 states during January 1–August 24, 2013. A total of 159 cases of measles were reported during this period.

**KEY FINDINGS:** Unvaccinated people place themselves and others in their communities at risk for measles and other vaccine-preventable diseases. Measles is a highly contagious viral disease that is preventable by vaccination. In the United States, measles elimination (i.e., absence of year-round transmission) was declared in 2000. However, measles continues to be imported into the United States from countries where measles is still common. During January 1–August 24, 2013, 159 measles cases, including 8 outbreaks were reported to CDC. An outbreak in New York City is the largest outbreak reported in the United States since 1996 (56 cases). Most cases were imported-associated (157 [99 percent]) and in persons who were unvaccinated (73 [82 percent]) or had unknown vaccination status [15 (9 percent)]. Among U.S. residents who were unvaccinated, 92 (79 percent) have philosophical objection to vaccination. High vaccine coverage is important to prevent spread of measles following importation.

**LINK:** [www.cdc.gov/mmwr/preview/mmwrhtml/mm6236a2.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6236a2.htm)


**SUMMARY:** During the first 19 weeks of 2011, 118 cases of measles were reported, the highest number reported for this period since 1996.

**KEY FINDINGS:** Unvaccinated persons accounted for 105 (89 percent) of the 118 cases. Among the 43 U.S. residents aged 12 months through 19 years who acquired measles, 38 (87 percent) were unvaccinated, including 24 whose parents claimed a religious or personal exemption and eight who missed opportunities for vaccination. Among the 42 U.S. residents aged >20 years who acquired measles, 35 (85 percent) were unvaccinated, including six who declined vaccination.

**LINK:** [www.cdc.gov/mmwr/preview/mmwrhtml/mm615026.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm615026.htm)
vaccination because of philosophical objections to vaccination. Of the 33 U.S. residents who were vaccine-eligible and had traveled abroad, 30 were unvaccinated and one had received only one of the 2 recommended doses.

**LINK:** [www.cdc.gov/mmwr/preview/mmwrhtml/mm6002a3.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6002a3.htm)


**SUMMARY:** A descriptive analysis of all cases of measles reported in the United States during 2001–2008.

**KEY FINDINGS:** A total of 557 confirmed cases of measles and 38 outbreaks were reported during 2001–2008. Of these outbreaks, the 3 largest occurred primarily among personal belief exemptions (defined as persons who were vaccine-eligible, according to recommendations of the Advisory Committee on Immunization Practices or the World Health Organization, but remained unvaccinated because of personal or parental beliefs). During 2004–2008, a total of 68% of reported measles cases were among unvaccinated U.S. residents, who were age-eligible for vaccine but who claimed a personal belief exemption to state immunization requirements.


**SUMMARY:** Researchers mapped vaccination refusal rates by school and school district, analyzed measles transmission patterns, and conducted discussions and surveys to examine beliefs of parents who decline vaccination for their children.

**KEY FINDINGS:** An intentionally unvaccinated 7-year-old child who was unknowingly infected with measles returned from Switzerland, resulting in 11 additional measles cases and in known measles exposure of more than 800 people. In San Diego, high personal belief exemption (PBE) rates were found in 10 schools (range, 42%–100%); schools and districts with high refusal rates were clustered geographically. Across all surveyed kindergartens, higher PBE rates correlated strongly with lower measles vaccination rates.


**SUMMARY:** A case-control study of 133 physician-diagnosed cases of varicella among Kaiser Permanente Colorado members between 1998 and 2008; each case was matched with 4 randomly selected controls (i.e., people who did not have varicella disease).

**KEY FINDINGS:** Compared with children of vaccine-accepting parents, children of vaccine-refusing parents had a 9-fold higher risk of varicella illness. Overall, 5% of varicella cases in the study population were attributed to vaccine refusal.


**SUMMARY:** A case-control study of 156 physician-diagnosed cases of pertussis among Kaiser Permanente Colorado members between 1998 and 2007; each case was matched with 4 randomly selected controls (n=595).

**KEY FINDINGS:** Vaccine refusers had a 2.9-fold higher risk for pertussis when compared with vaccine acceptors, and 11% of pertussis cases in the entire study population were attributed to vaccine refusal.


**SUMMARY:** In 2008, during routine surveillance conducted by public health workers in Minnesota for invasive H. influenzae type b (Hib) disease, five children ages 3 months to 3 years were reported with invasive Hib disease; one child died.

**KEY FINDINGS:** Three of the five children with invasive Hib disease had not been vaccinated. One of the children was too young to complete the primary series of Hib vaccine, and another child, who had completed the primary series, was found to have an immune disorder that impairs response to vaccination.

**LINK:** [www.cdc.gov/mmwr/preview/mmwrhtml/mm5803a4.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5803a4.htm)


**SUMMARY:** Researchers evaluated the geographic clustering of personal belief exemptions in Michigan (1994–2004) for 4,495 schools and measured the geographic overlap between exemption clusters and clusters of reported pertussis cases (1993–2004). For 1,399 cases among people 18 years and younger.

**KEY FINDINGS:** Researchers reported significant overlap between clusters of exemptions and clusters of pertussis cases. In addition, exemption rates appear to be increasing in Michigan, and nonmedical exemptions tend to be geographically clustered.


**SUMMARY:** Researchers conducted a focus group and interviews with church leaders and families following a measles outbreak among church members in Indiana.

**KEY FINDINGS:** Vaccine refusal was attributed to a combination of personal religious beliefs and safety concerns among a subgroup of church members. Among interviewees from outbreak households, none had received MMR vaccine prior to the outbreak. Four of the six outbreak households reported that they would consider some or all recommended vaccines in the future.

54 of 99 evaluable schools in our three counties have >5% students whose parents claimed non-medical exemption for all and any vaccine. 27 of the schools had 12% for greater (up to 60%) non-medical exemption students. 67% of all students in Deschutes County are at schools with >5% of students whose parents who claimed non-medical exemptions, compared with only 4% in Jefferson and Crook Counties. All but two of the faith-based schools are in the >5% non-medical exemption schools. All of the schools on the west side of Bend are >5% non-medical exemption schools. The schools with the greatest risk of measles, mumps, rubella, pertussis, hepatitis B or C, tetanus and diptheria are in westside Bend and sectarian schools.
Risks and Benefits of Vaccines – Anti-Vax Edition

Anti-vax folks like to say that they are doing their research, even collecting that research into handy binders. And they like to think that they are looking at both the risks and benefits of vaccines when they make their decision to skip or delay their child's vaccines.

When anti-vax folks look at the risks and benefits of vaccines, they see lots of risks and few benefits.
## Guide to Contraindications and Precautions to Commonly Used Vaccines

<table>
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<tr>
<th>Vaccine</th>
<th>Contraindications</th>
<th>Precautions</th>
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| Hepatitis B (HepB)                          | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component  
• Hypersensitivity to yeast | • Moderate or severe acute illness with or without fever  
• Infants weighing less than 3000 grams (6 lb, 4 oz)² | |
| Rotavirus (RSV [Rotatago], RSV [Baltovax]) | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component  
• Severe combined immunodeficiency (SCID)  
• History of intussusception | • Moderate or severe acute illness with or without fever  
• Altered immunocompetence other than SCID  
• Chronic gastrointestinal disease³  
• Spina bifida or hydrocephaly² | |
| Diptheria, tetanus, pertussis (DTaP)        | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component  
• For pertussis-containing vaccines: neuropathy (e.g., coma, decreased level of consciousness, prolonged seizures) not attributable to another identifiable cause within 7 days of administration of a previous dose of DT or DTaP for DTaP) | • Moderate or severe acute illness with or without fever  
• Condition arising from the last dose of pertussis-containing vaccine, if vaccine was administered within 6 weeks after a previous dose of tetanus toxoid-containing vaccine  
• History of anaphylactic reactions after a previous dose of diphtheria or tetanus toxoid-containing vaccine, diphtheria vaccination until at least 10 years have elapsed since the last tetanus toxoid-containing vaccine  
• For DTaP and Tdap only: Progressive or unstable neurological disorder (including infantile spasms for DTaP), uncontrolled seizures, or progressive encephalopathy, if vaccine is administered until a treatment regimen has been established and the condition has stabilized | |
| Haemophilus influenzae type b (Hib)         | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component  
• Age younger than 6 weeks | • Moderate or severe acute illness with or without fever | |
| Inactivated poliovirus vaccine (IPV)        | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component | • Moderate or severe acute illness with or without fever  
• Pregnancy | |
| Hepatitis A (HepA)                         | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component | • Moderate or severe acute illness with or without fever  
• Pregnancy | |
| Measles, mumps, rubella (MMR)⁴            | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component  
• Severe immunodeficiency (e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy), or persons with HIV infection who are severely immunosuppressed³  
• Family history of congenital or hereditary immunodeficiency in first-degree relative (e.g., parent and siblings), unless the immune competence of the potential vaccine recipient has been substantiated clinically or verified by a laboratory test  
• Pregnancy | • Moderate or severe acute illness with or without fever  
• Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product)³  
• History of thrombocytopenia or thrombocytopenic purpura  
• Need for tuberculin skin testing or interferon-gamma release assay (IGRA) testing  
• For MMR only: Family or personal history of seizures | |
| Varicella (Varz)                            | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component  
• Severe immunodeficiency (e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy), or persons with HIV infection who are severely immunosuppressed³  
• Family history of congenital or hereditary immunodeficiency in first-degree relative (e.g., parent and siblings), unless the immune competence of the potential vaccine recipient has been substantiated clinically or verified by a laboratory test  
• Pregnancy | • Moderate or severe acute illness with or without fever  
• Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product)³  
• Receipt of specific antiviral (i.e., aciclovir, famciclovir, or valacyclovir) 24 hours before vaccination; avoid use of these antiviral drugs for 14 days after vaccination  
• Use of aspirin or aspirin-containing products  
• For Varz only: Family or personal history of seizures | |
| Pneumococcal (PCV13 or PPV23)              | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component (including, for PCV13, to any vaccine containing diphtheria toxoid) | • Moderate or severe acute illness with or without fever | |
| Human papillomavirus (HPV)⁴               | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component | • Moderate or severe acute illness with or without fever | |

CONTINUED ON THE NEXT PAGE
## Vaccine

### Influenza, inactivated injectable (IV)
- Severe allergic reaction (e.g., anaphylaxis) to any component of the vaccine (except egg) or to a previous dose of influenza vaccine.

### Influenza, recombinant (IV)
- Severe allergic reaction (e.g., anaphylaxis) to any component of the vaccine (except egg) or to a previous dose of influenza vaccine.

### Influenza, live attenuated (LAIV)
- Severe allergic reaction (e.g., anaphylaxis) to any component of the vaccine (except egg) or to a previous dose of influenza vaccine.

### Meningococcal (MenACWY; MenB)
- Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component.

### Recombinant zoster vaccine (RZV)
- Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component.

### Zoster vaccine live (ZVL)
- Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component.

## Precautions

- History of GBS within 6 weeks of previous influenza vaccination.
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## Footnotes

1. The Advisory Committee on Immunization Practices (ACIP) recommendations and package inserts for vaccines provide information on contraindications and precautions related to vaccines. Contraindications are conditions that increase chances of a severe adverse reaction in vaccine recipients and the vaccine should not be administered when a contraindication is present. Precautions should be reviewed for potential risks and benefits for vaccine recipients. For a person with a severe allergy to latex (e.g., anaphylaxis), vaccines supplied in vials or syringes that contain natural rubber latex should not be administered unless the benefit of vaccination clearly outweighs the risk for a potential allergic reaction. For latex allergies other than a severity, vaccines supplied in vials or syringes that contain natural rubber latex or natural rubber may be administered.

2. Hepatitis B vaccination should be deferred for persons whose infants weigh less than 2000 g at birth or those who have been exposed to hepatitis B virus (HBV).

3. Intramuscular injections should be given at least 2 cm from the site of previous injections.

4. Age-appropriate pentavalent vaccine (HAV, MMR, Var, and DT) can be administered on the same day, if administered on the same day, these live vaccines should be separated by at least 28 days.

5. For influenza vaccine, at least 4 weeks after discontinuation of the corticosteroid therapy.

6. HS: Injection should be given to all individuals 65 years of age or older, who have not received a previous dose of the influenza vaccine in the 2021-2022 season.

7. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.

8. Allergic reactions, including anaphylaxis, to any component of the vaccine, including neomycin.

9. History of GBS may be considered if a patient has an acute illness, especially if it is severe or prolonged.

10. GBS may be considered if a patient has an acute illness, especially if it is severe or prolonged.

11. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.

12. HS: Injection should be given to all individuals 65 years of age or older, who have not received a previous dose of the influenza vaccine in the 2021-2022 season.

13. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.

14. HS: Injection should be given to all individuals 65 years of age or older, who have not received a previous dose of the influenza vaccine in the 2021-2022 season.

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17. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.

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19. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.

20. HS: Injection should be given to all individuals 65 years of age or older, who have not received a previous dose of the influenza vaccine in the 2021-2022 season.

21. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.

22. HS: Injection should be given to all individuals 65 years of age or older, who have not received a previous dose of the influenza vaccine in the 2021-2022 season.

23. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.

24. HS: Injection should be given to all individuals 65 years of age or older, who have not received a previous dose of the influenza vaccine in the 2021-2022 season.

25. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.

26. HS: Injection should be given to all individuals 65 years of age or older, who have not received a previous dose of the influenza vaccine in the 2021-2022 season.

27. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.

28. HS: Injection should be given to all individuals 65 years of age or older, who have not received a previous dose of the influenza vaccine in the 2021-2022 season.

29. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.

30. HS: Injection should be given to all individuals 65 years of age or older, who have not received a previous dose of the influenza vaccine in the 2021-2022 season.

31. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.

32. HS: Injection should be given to all individuals 65 years of age or older, who have not received a previous dose of the influenza vaccine in the 2021-2022 season.

33. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.

34. HS: Injection should be given to all individuals 65 years of age or older, who have not received a previous dose of the influenza vaccine in the 2021-2022 season.

35. CD4+ T-cell counts less than 50 cells/mm³ or HIV-1 RNA levels greater than 50 copies/mL.
Additional Resources

• Boostoregon.org

• ImmunizeOR.org

• Immunize.org

• Vaxxopedia