



What is the immunization law?

Immunization law states that parents are required to fully vaccinate children prior to school or child care entry. Immunizations help to protect the wellbeing of the individual child, his/her classmates and the community.

Why does the state of Vermont have an immunization law?

Laws are made to protect the public's health and safety. Vaccine requirements are important in preventing the spread of infectious diseases. Before vaccines, millions of children were sickened or killed by infectious diseases, which were often spread in community settings. Other health and safety issues that impact the public are mandated by the government such as: traffic lights, security prior to air travel, food safety laws, and rules about text messaging while driving.

What is an exemption?

State-specific immunization laws pertain to children entering school or child care, but some children cannot be vaccinated due to medical conditions. Therefore, all 50 states allow parents to file a physician-signed medical exemption form if their child is medically ineligible for vaccination. There are two additional reasons to claim exemption: religious (allowed in 48 states) and philosophical objection (allowed in 20 states).

What is the history of philosophical exemptions in Vermont?

Since 1979, Vermont has allowed a philosophical exemption, and it is one of seven states that require only a parent signature for exemption. The 2011 rate of philosophical exemption to one or more vaccines among children entering kindergarten in Vermont is 5.2 percent, which is one of the highest rates in the country.

What are the exemption rates among schoolchildren in Vermont?

Data is reported on all children in child care, at kindergarten, 7th grade, and entry to certain post-secondary schools. The data reported reflects compliance with Vermont-specific vaccine and exemption requirements. For school year 2011–12, incoming combined public and private kindergarten exemption rates were: 0.3 percent medical, 0.1 percent religious, and 5.2 percent philosophic. In addition, 7.3 percent were provisionally admitted, meaning they did not meet vaccine requirements or have an exemption on file.

How many children in Vermont are fully vaccinated compared with the rest of the country?

For calendar year 2010, according to the Centers for Disease Control and Prevention (CDC) National Immunization Survey, 70 percent of Vermont children age 19–35 months received every vaccine in the recommended series. This compares to the national average of 73 percent.

What are the risks of not vaccinating my children?

Many people incorrectly assume that a choice not to get a vaccine is a risk-free choice, but it isn't. A decision to delay or refuse a vaccine is a decision to place your child, and possibly others, at risk for a vaccine-preventable disease. Studies have shown that unimmunized children are more likely to get vaccine-preventable diseases if there is an outbreak than those who have been immunized. In a global society, the risk of vaccine-preventable diseases is unclear, but we know that over 85 percent of U.S. measles cases in 2010 were imported from other countries. Unimmunized children will be excluded from school during an outbreak of a vaccine-preventable disease.

What is herd immunity and why is it important?

Vaccines are considered by some to be a civic duty because they create herd immunity. This means that when most of the people in a community are immunized, there is less opportunity for a disease to enter the community and make people sick. Because there are members of our society that are too young or otherwise unable to receive vaccines for medical reasons, they rely on herd immunity to keep them well.

Are vaccines safe?

Concern about safety is the number one reason parents choose to not vaccinate their children. Vaccines are rigorously tested for safety and efficacy, and are only released to the public after they have been thoroughly studied in clinical trials, as are all medications and pharmaceuticals approved by the U.S. Food and Drug Administration (FDA). Vaccines are not perfect in safety or effectiveness, but overall they are considered to be among the greatest achievements in public health, lowering the rate of infectious illness to a fraction of what it was a century ago.

How are vaccines tested before being recommended for children and adults?

The FDA meticulously regulates clinical development, safety testing and licensing of vaccines. Development of vaccines can take between eight and 17 years before they are available on the market. Vaccines that are approved

for use continue to be monitored by the FDA and the CDC.

How can I know if my child will have a reaction?

The design of the human body is infinitely unique, and therefore some people will not tolerate vaccines as well as others. This is true for all medications and medical products. Most vaccine side effects are mild, but serious side effects can occur in rare instances. It is impossible to know who will be sensitive to a vaccine or a medication until after they have received it.

How can people report a reaction to a vaccine?

Adverse reactions to vaccines can be reported to the Vaccine Adverse Events Reporting System (VAERS). Anyone can report any type of problem, and it only involves filling out a one-page form. The VAERS reports are reviewed by both the CDC and the FDA, and are useful in that they can raise the possibility of a problem, which can lead to further research to determine if a link exists. The inclusion of events in VAERS data does not mean a vaccine caused the event.

Do vaccines cause autism?

No. A study linking the measles-mumps-rubella (MMR) vaccine with autism was reported in *The Lancet* in 1998, but has since been retracted by the publishers when they discovered it was false. Since that time, a significant body of evidence has demonstrated the development of autism is entirely unrelated to childhood vaccines. Twelve large-scale studies have produced no evidence that children who receive MMR vaccine are at greater risk of autism than those who don't. In 2004, the Institute of Medicine (IOM) published a consensus report concluding that the body of epidemiological evidence found no relationship between MMR and autism, or thimerosal-containing vaccines and autism.

Is a vaccine a toxin?

Vaccines contain either a weakened or killed version of an infectious microbe (virus or bacteria). Tiny amounts of other ingredients are added to some vaccines to increase the efficacy and decrease the possibility of contamination. These ingredients are present in very low amounts and are not considered toxic for children or adults. However, in rare instances, individuals can be sensitive or allergic to these ingredients.

What is added to vaccines?

- Adjuvants are added to vaccines to enhance the immune response, which allows for lesser quantities of vaccine and fewer doses. For example, tiny amounts of aluminum salts are added to vaccines (less than the amount found in a six month supply of breast milk or infant formula).
- Antibiotics are present in some vaccines to prevent bacterial contamination during the manufacturing process.
- Yeast proteins are added during the creation of hepatitis B vaccine and one brand of the human papillomavirus (HPV) vaccine (Gardasil). Yeast proteins do not cause an allergic reaction in people who are allergic to bread products.
- Gelatin is used in vaccines as a stabilizing agent, allowing small quantities of live viral vaccine to be evenly distributed throughout the container. The incidence of allergic reaction to gelatin is extremely low (1 in 2 million doses).
- Thimerosal, a preservative containing mercury, was removed from virtually all vaccines by the spring of 2001, although it has never been associated with adverse effects. In 2012, thimerosal can only be found in multidose preparations of inactivated influenza vaccines.
- Vaccines contain a small amount of formaldehyde used to inactivate viruses and bacteria. The quantity of formaldehyde in individual vaccines does not exceed one tenth of a milligram, which is considered to be safe because it is essential in human metabolism, and is required for the synthesis of amino acids. Everybody has

detectable quantities of formaldehyde in their bloodstream, and there is far more naturally circulating in the body than what is contained in vaccines.

- Neither antifreeze nor ether is added to any vaccine.
- Some vaccines are created with human fetal cells that were obtained from two elective abortions (one in England and one in Sweden) in the early 1960's. These two sources of fetal cells have been used to make vaccines against rubella, rabies, chickenpox and hepatitis A. These vaccines are approved for use by the Vatican and National Catholic Bioethics Center in Boston, and are not considered to be immoral by these groups.

Why are so many vaccines given to children at once?

Vaccines are recommended when there is a clear health benefit. Recommendations are made by the Advisory Committee on Immunization Practices after a thorough evaluation and review. The vaccine schedule has changed over the years as new vaccines have been developed, existing vaccines have been improved, and revised recommendations have been made. In fact, every year since 1995 the CDC, American Academy of Pediatrics (AAP), and American Academy of Family Physicians (AAFP) have endorsed an annual childhood immunization schedule.

Not all vaccines that are licensed are broadly recommended for children. Vaccines are used only in specific populations where the risk/benefit is clear. Rabies, typhoid and yellow fever vaccines are only recommended for people at high risk for infection.

Will all of the vaccines overwhelm my child's immune system?

From the time babies leave the womb they are colonized with trillions of bacteria, requiring them to constantly make antibodies to protect themselves from infection. Children are also exposed to a variety of viruses that can cause runny noses, congestion, cough, fever and diarrhea. The immunological components in vaccines today are

miniscule compared with the immunological challenges that infants handle everyday.

Although children receive more vaccines now than ever before, the number of immunological components in vaccines has dramatically decreased. Thirty years ago children received seven vaccines that contained more than 3,000 bacterial and viral proteins. Today, there are only about 150 in 14 vaccines.

What is the impact of vaccines over time?

Vaccines have literally transformed the landscape of medicine over the course of the 20th century. Before vaccines, parents in the United States could expect that every year:

- Polio would paralyze 10,000 children.
- Rubella (German measles) would cause birth defects and mental retardation in as many as 20,000 newborns.
- Measles would infect about 4 million children, and kill 3,000.
- Diphtheria would be one of the most common causes of death in school-aged children.
- A bacterium called *Haemophilus influenzae* type b (Hib) would cause meningitis in 15,000 children, leaving many with permanent brain damage.
- Pertussis (whooping cough) would kill thousands of infants.

Why do we use vaccines if they are not 100% effective?

The majority of vaccines are at least 90 percent effective, and have significantly lowered the rate of disease in the U.S. Rates of vaccine efficacy can be variable, but the overall impact of immunization in a community makes it worthwhile. For some diseases such as smallpox, polio and diphtheria, the vaccines have reduced the number of cases by 100 percent in the U.S. Since vaccines were developed for measles, mumps, rubella and Hib, the number of cases have decreased by 99 percent. Pertussis efficacy ranges from 80–85 percent, so about 20 percent of people who are vaccinated could be susceptible to the disease, but their illness is often less severe than those who were not vaccinated. Varicella (chicken pox) vaccine efficacy ranges from 70 – 100% but those who experience breakthrough infection have significantly milder illness, generally without fever and with few lesions.

Are parents informed about the risks and benefits of vaccination?

Yes. The National Childhood Vaccine Injury Act of 1986 requires that health care providers give parents a Vaccine Information Statement (VIS) with information about the benefits and risks of each immunization their child receives. The VIS must be given out at the time of each vaccination prior to the administration of the vaccine.

References:

Offit, Paul A. & Charlotte A. Moser, *Vaccines and Your Child: Separating Fact from Fiction*, Columbia University Press, New York, 2011.
Children's Hospital of Philadelphia Vaccine Education Center www.chop.edu
Centers for Disease Control and Prevention www.cdc.gov/vaccines