Facts on Kids in South Dakota
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Childhood Immunizations

Introduction

With the new school year, parents and school officials are worried about the spread of the H1N1 flu virus. The virus was first detected in the United States in April 2009. By June the World Health Organization (WHO) stated that a world pandemic was likely. Prevention may be possible due to a vaccine that could be available for priority groups such as pregnant women and children and young adults ranging from 6 months to 24 years old. Still, some may question the safety of the H1N1 vaccine; indeed, parents are concerned about the safety and necessity of childhood immunizations for several generations. Some may wonder why vaccinations are given for diphtheria and smallpox, when the diseases are nearly eradicated. This Facts on KIDS will address several themes of childhood immunizations.

Note: for purposes here vaccines and immunizations are used interchangeably.

Vaccine Benefits

Chances are you never had diphtheria and you do not know anyone who has. You could say the same for diseases such as measles, mumps, rubella, or the whooping cough. Yet, these diseases were very real to people living in the 19th and early 20th centuries. Each year, hundreds of thousands of people in the U.S. contracted the diseases and tens of thousands died from them – mostly children. The names of these diseases were frightening words; today, they are all but forgotten. Their near eradication was made possible through the use of vaccines.

Vaccines work by taking advantage of the body's natural ability to learn how to fight against germs or microbes, that cause disease. The body, via the immune system, "remembers" how to protect itself from microbes that it has encountered before. It takes about a week for the immune system to learn how to fight an unfamiliar microbe by developing antibodies. However, some microbes are strong enough to overwhelm or even escape the immune system. In these situations, vaccines make a big difference.

Traditional vaccines contain a weakened or dead form of microbes so that instead of developing the disease, the body confronts the harmless microbes and learns how to overcome them. When your immune system is trained to resist the disease, you are said to be immune to it.

Before vaccines were developed, the only way to become immune to a disease was to actually get it and survive it. This is called "naturally acquired immunity." With naturally acquired immunity, you suffer the symptoms of the disease and risk complications such as paralysis, retardation, liver cancer, deafness, blindness, or even death. Furthermore, during certain stages of disease, the sickness is highly contagious and may be passed to family members and anyone who comes into contact with you. Vaccines are an easier and much less risky way to become immune to serious disease. Instead of attempting a cure after the fact, a vaccine can prevent disease in the first place by creating artificial immunity.

Vaccines can save you money

The National Institute of Allergy and Infectious Diseases (2009) highlights a 2005 study that calculated the economic impact of routine childhood immunization in the United States. Researchers estimated that the vaccination program saved $5 in direct costs for every dollar spent and an additional $11 in costs to society. Vaccines can protect entire communities and are essential to meeting the public health goal of preventing diseases.

Statistics show that vaccines work

The Immunization Action Coalition (2008) lists examples of dramatic declines in vaccine-preventable diseases. For instance, during the pre-vaccine era, there were 47,745 estimated annual deaths due to rubella. In 2007, there were 11 U.S. cases of rubella. Likewise, in the pre-vaccine era, nearly everyone in the U.S. got measles. More than four hundred people died each year from measles between 1953 and 1963. In 2007, 55 total cases were reported.

It is worthwhile to continue vaccinating, even though some diseases are almost entirely gone from the U.S. The Centers for Disease Control (CDC) uses the imagery of a boat sinking from a slow leak. When you start bailing with a bucket, the boat is full of water. After working

fast and hard, the boat is almost dry – but it's too early to throw out the bucket because the leak has not been fixed. Before long, water would seep in again and soon it would be at the same level as before. Similarly, it is important to keep immunizing because diseases are still present in the environment. Even if only a few people contract the disease, it will spread to others, and progress will quickly deteriorate.

Japan is an example. In 1974, 80% of Japan's children were vaccinated for whooping cough. Fewer than 400 cases were reported that year and no one died from the disease. Rumors surfaced that the vaccine was no longer necessary and by 1976, only 10% of infants were getting vaccinated. In 1979, Japan suffered a major whooping cough epidemic: 13,000 cases and 41 deaths.

If we stop vaccinating, we can expect a comeback from diseases that are currently all but forgotten in our country. Finally, remember that other countries have not had the same immunization success as the U.S. - diseases that have been eradicated in this country are common in other parts of the world and are only a plane flight away. With the high rate of international travel, these diseases could be easily brought into the country.

Today, infants and young children under age two can be protected from fourteen serious diseases: bacterial meningitis, diphtheria, hepatitis A, hepatitis B, influenza, measles, mumps, pertussis (whooping cough), pneumococcal disease, polio, rubella (German measles), tetanus, rotavirus, and varicella (chicken pox). Vaccinations are among the best ways to avoid the serious effects of certain diseases that strike young children in particular. (See chart on Recommended Imunuzations).

Immunization in South Dakota

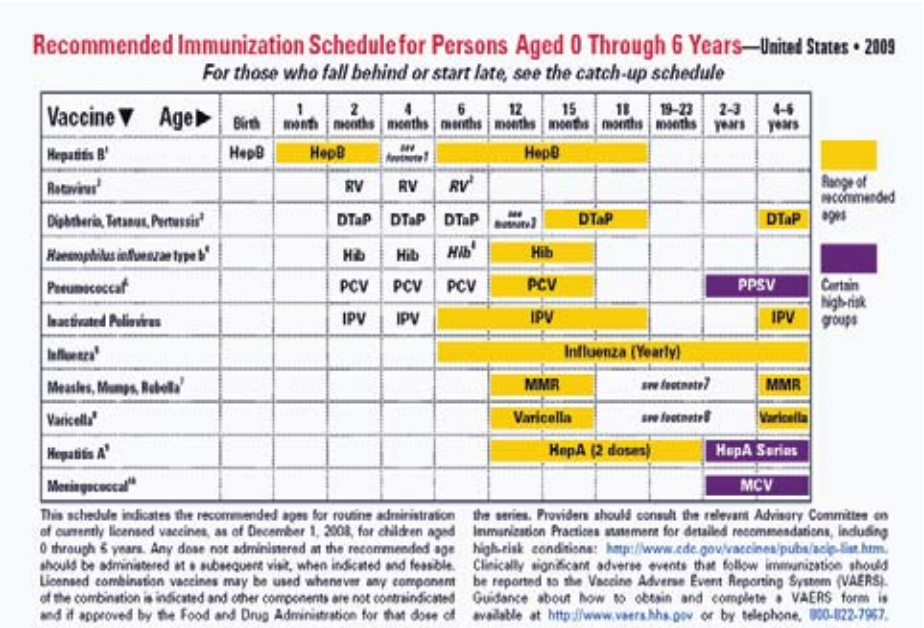
South Dakota law requires children entering school or an early childhood education program to present certification that they have been properly immunized according to recommendations by the Department of Health (http://doh.sd.gov/Immunize/School.aspx).

Minimum requirements are defined as:

1. Four or more doses of diphtheria, pertussis and tetanus containing vaccine, with at least one dose administered on or after age four.
2. Three or more doses of poliovirus vaccine, at least one dose on or after age four.
3. At least two doses of a measles-containing vaccine separated by at least 28 days, on or after first birthday.
4. At least two doses of a rubella-containing vaccine, separated by at least 28 days, on or after first birthday.
5. At least two doses of a mumps-containing vaccine, separated by at least 28 days, on or after first birthday.
6. *NOTE: Additional immunization requirement for kindergarten entry only: Effective August 2007, two doses of varicella (chickenpox) vaccine administered after the age of 12 months, or history of disease.*

Addressing concerns - Are vaccines safe?

The CDC affirms that vaccines are indeed safe. Vaccines must be licensed by the Food and Drug Administration (FDA) before they can be given to children and the general public. Vaccines undergo rigorous testing to ensure they are safe, including testing for the presence of known viruses, bacteria, fungi, or parasites separate from those used in the vaccine, before the FDA licenses it for public use. The vaccine is continually monitored for safety during use by two



Recommended Immunization Schedule for Persons Aged 0 Through 6 Years—United States • 2009

For those who fall behind or start late, see the catch-up schedule

Vaccine ▼ Age ►	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years
Hepatitis B[1]	HepB	HepB			HepB						
Rotavirus[2]			RV	RV	RV[2]						
Diphtheria, Tetanus, Pertussis[3]			DTaP	DTaP	DTaP	see footnote 3	DTaP				DTaP
Haemophilus influenzae type b[4]			Hib	Hib	Hib[4]	Hib					
Pneumococcal[5]			PCV	PCV	PCV	PCV				PPSV	
Inactivated Poliovirus			IPV	IPV	IPV						IPV
Influenza[6]					Influenza (Yearly)						
Measles, Mumps, Rubella[7]						MMR	see footnote 7				MMR
Varicella[8]						Varicella	see footnote 8				Varicella
Hepatitis A[9]						HepA (2 doses)				HepA Series	
Meningococcal[10]										MCV	

Range of recommended ages

Certain high-risk groups

This schedule indicates the recommended ages for routine administration of currently licensed vaccines, as of December 1, 2008, for children aged 0 through 6 years. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. Licensed combination vaccines may be used whenever any component of the combination is indicated and other components are not contraindicated and if approved by the Food and Drug Administration for that dose of the series. Providers should consult the relevant Advisory Committee on Immunization Practices statement for detailed recommendations, including high-risk conditions: http://www.cdc.gov/vaccines/pubs/acip-list.htm. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at http://www.vaers.hhs.gov or by telephone, 800-822-7967.

http://www.cdc.gov/vaccines/recs/schedules/default.htm

systems: the Vaccine Adverse Event Reporting System (VAERS), which is managed jointly by the FDA and the CDC, and the Vaccine Safety Datalink (VSD) Project. The VSD Project is conducted by the CDC and several large managed care organizations that collect comprehensive medical information to monitor data for adverse events that could be associated with newly licensed vaccines. VAERS relies on information from the public to watch for any health problems that follow vaccination.

Parents need not be alarmed by minor side effects after vaccination such as soreness or low-grade fever. These side effects do not last long and are treatable. More serious side effects are rare. For example, approximately one of every 600,000 doses of the hepatitis B vaccine is complicated by an allergic reaction called anaphylaxis. Symptoms may include difficulty breathing, a drop in blood pressure, or hives.

On the other hand, thousands of people die every year after becoming infected by the hepatitis B virus. Children are especially likely to develop severe and fatal consequences of the virus infection. Parents need to consider the small risk of a serious vaccine reaction compared to the very dangerous risk of getting a vaccine-preventable disease.

Are infants too young to get vaccinated?

Parents may be concerned that infants do not have a strong enough immune system to handle vaccines. The Immunization Action Coalition in its document, Vaccine Concerns (2004), explains that scientists theorize that the number of microorganisms a body responds to depends on one's size. The scientists estimate that even young infants can respond to approximately 100,000 different organisms at one time. Eleven vaccines are required for all children, meaning that these vaccines will use up only about 0.01% of available immunity.

Furthermore, several vaccine-preventable diseases strike very young children. The Coalition states:

- Pertussis (whooping cough) infects about 8,000 children, causing five to ten deaths every year in the United States. Almost all of the cases are in children less than one year of age.
- Children under two years old are 500 times more likely to catch Hib meningitis if someone with a Hib infection is living in the home.
- About 90 percent of newborns whose mothers are infected with hepatitis B will contract hepatitis and go on to develop chronic liver disease, cirrhosis, and possibly liver cancer.

For these reasons, it is very important for infants to be immunized against certain diseases by the time they are six months old.

Do children get too many shots?

There are eleven routinely recommended vaccines, allowing for as many as twenty shots by the time the child is two years old (up to five shots during a single visit). Children can handle this many shots because vaccines are simply a small part of what babies come across every day in their regular environments. At birth, newborns immediately face a variety of challenges to their immune system, including thousands of bacteria that begin to live on the skin, in the linings of the nose, throat, and intestines. Babies are able to quickly make an immune response due to billions of immunologic cells that circle their bodies. The vaccines given to infants and toddlers during their first two years of life are just a small piece of what infants' immune systems successfully encounter each day. Parents may wish to delay shots, but delaying merely leaves the child unprotected and at risk for contracting one of the preventable diseases (think hospital stays, permanent injury, or even death). Also consider that today's vaccines contain fewer viral proteins than the smallpox vaccine of a hundred years ago. The smallpox vaccine consisted of 200 viral proteins; today's eleven routinely recommended vaccines contain less than 130.

Do vaccines cause autism?

Recent stories in the media may lead a parent to believe that vaccines, particularly the MMR vaccine, can cause autism. Dr. Ari Brown, author of Clear Answers & Smart Advice about Your Baby's Shots (2008), says that scientific evidence does not support this theory. Dr. Brown writes that the CDC has done extensive research to examine vaccines and autism in the last ten years. A recent report published in the New England Journal of Medicine showed that the mercury preservative previously used in vaccines had no "significant effect on either intelligence or developmental delay in kids ages seven to 10." Mercury preservatives (thimerosal) were removed in 2001 from vaccines given to infants and young children, but the number of children diagnosed with autism continues to rise. Denmark removed mercury preservatives earlier (1992) and Canada and the European Union followed its example. Interestingly, their autism rates are also increasing.

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