Plain talk about

IMMUNIZATIONS

10th Edition

Washington State Department of HEALTH

A Message to Readers

Plain Talk About Immunizations was originally created to address the growing need for clear and simple information about vaccines and diseases. While the manual is written for the public, health care providers and public health professionals may find this manual a helpful resource in their work.

The manual is a bit large to read through in one sitting. Instead, we recommend people search for relevant information to answer questions. The following page contains the index, which can be used to find chapters on specific vaccine topics. For example, the COVID-19 pandemic brought a renewed concern around vaccine safety. In this case, reading **Chapter 4** through **Chapter 6** may be helpful.

The newest version of the manual, published in April 2024, received some major updates. The Department of Health put a renewed focus on updating as well as simplifying information. Additionally, new content was added to reflect the nation's experience with disease outbreaks and the addition of new immunization.

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Chapter 1: Vaccines Save Lives

Vaccines have saved millions of lives and prevented illness and lifelong disability. This makes vaccines one of the greatest medical successes in history. We can prevent many serious childhood diseases by using vaccines, such as whooping cough and polio. However, many young parents today might not be aware of these dangers because they haven't seen many of these diseases. Since the introduction of these vaccines, the rate of many diseases has declined by 95 to 100 percent. Before we had vaccines, hundreds of thousands of children got infected and thousands died in the United States each year from these diseases. Even though these diseases are much less common today, serious disease outbreaks can happen when people are not vaccinated. The following data from the Centers for Disease Control and Prevention (CDC) show dramatic declines in vaccine preventable diseases since routine childhood vaccination began in the U.S.

Disease	Pre-Vaccine Era Estimated Annual Morbidity	Most Recent Reports or Estimates of U.S. Cases	Percent Decrease
Diphtheria	21,053	2	>99%
Haemophilus influenzae serotype B (invasive, <5 years of age)	20,000	18	>99%
Hepatitis A	117,333	~37,700	68%
Hepatitis B (acute)	66,232	~20,700	69%
Measles	520,217	1,275	>99%
Meningococcal disease	2,886	371	87%
Mumps	162,344	3,780	98%
Pertussis	200,752	18,617	91%
Pneumococcal disease (invasive, <5 years of age)	16,069	1,700	89%
Polio (paralytic)	16,316	0	100%
Rotavirus (hospitalizations, <3 years of age)	62,500	30,625	51%
Rubella	47,745	6	>99%
Congenital Rubella Syndrome	152	1	>99%
Smallpox	29,005	0	100%
Tetanus	580	26	96%
Varicella	4,085,120	8,297	>99%
View CDC statistics references here.			

Immunizations Offer Strong Protection

Immunization is a process when a person becomes protected against a disease. This is usually done through vaccination and both words are often used to mean the same thing.

On-time vaccinations throughout childhood are essential because they help provide immunity before children are exposed to potentially life-threatening diseases. Vaccines are the safest, most effective

way to protect yourself and your family from many preventable diseases.

The decision to vaccinate is an important one. Some diseases, like polio and diphtheria, are rare in the U.S., but anyone traveling to or from another country can catch and spread these diseases. Consider the following when making your decision.

Immunizations:

Prevent common diseases. Some common diseases in the U.S. are also very serious, like whooping cough, flu, and rotavirus. If you decide not to vaccinate, there is a risk that you, your child, and loved ones won't be protected from serious and sometimes deadly diseases.

Prevent diseases that exist at low levels in the U.S. but could easily come back. Some diseases, like measles and mumps, still occur in our country at low levels. When fewer people get vaccinated against these diseases, outbreaks can happen.

Prevent diseases that exist in other parts of the world. Sometimes people get infected when they are exposed to someone who has lived or traveled in areas of the world where a disease is more common.

Protect others in your family and community. By vaccinating yourself, your child, and your loved ones, you also protect those who:

- Have weak immune systems, like those who have cancer.
- Cannot get vaccinated because they are the wrong age for the vaccine, like babies.
- Cannot get certain vaccines because they have certain medical conditions or have severe allergic reactions.
- Are not fully vaccinated.

Vaccines Work with the Immune System

The immune system is our body's defense to help fight disease. When a virus or bacteria infects you, your body responds by producing antibodies to protect against the disease. Vaccines are the most effective way to build immunity (protection) without suffering from the harmful effects of the disease. Vaccines work by imitating an infection to stimulate the body to produce antibodies. Read more about how vaccines work in **Chapter 3**.

Babies often have immunity to some diseases because they have antibodies from their parent. We call these maternal antibodies. Maternal antibodies are temporary and are only passed on to the baby if the parent has immunity to certain diseases. Vaccinating young children helps them keep immunity for different diseases, even after they lose the protection from maternal antibodies.

What About Alternatives to Vaccines?

There is no effective alternative to vaccination for protection against serious and deadly diseases. However, people may be aware of the use of vitamins or herbs to prevent disease. There is no scientific evidence that vitamins and herbs provide immunity (protection) against diseases that vaccines prevent. Although vitamins and herbs either from supplements or a healthy diet may have beneficial effects on your health, they cannot replace the proven protection of vaccines. It is important to discuss over the counter supplements, vitamins and herbs with your provider to prevent possible side effects or interactions with other medical treatments.

For babies, drinking human milk has proven benefits, like helping to protect against ear infections, diabetes, and asthma. Additionally, breast or chest feeding helps the parent and baby bond. While breast or chest feeding human milk provides some temporary protection against disease that vaccines prevent, it is not as effective as vaccinating your baby for the positive long-term preventive health impact.

Immunizations are a Safe Choice

The U.S. has the safest, most effective vaccines in history. Before a vaccine can get licensed for use, U.S. law requires that vaccines go through rigorous testing. Scientists and medical experts carefully review all of the information about the vaccine to make sure it's safe and effective before recommending the vaccine. Even after a vaccine gets licensed and can be used, it continues to be monitored for safety and effectiveness. More information is available from CDC.

In the case of COVID-19, vaccines were tested in thousands of people in clinical trials. They met high safety standards and have been shown to be safe and effective. For more information about vaccine testing, read **Chapter 4**.

Even with high safety standards and continuous monitoring, vaccines are not perfect. First, vaccines are not 100 percent effective. Some vaccines do not completely prevent infection. Instead, they might reduce the severity of disease, including hospitalization and death. Like any medication, vaccines can cause side effects:

- Vaccines can cause mild reactions, such as soreness or swelling where the shot was given.
- Very rarely, people experience more serious side effects, such as allergic reactions. Families should let their health care provider know if they or their child have health problems or severe life-threatening allergies to specific medications or foods.
- Severe reactions to vaccines occur so rarely that the risk is difficult to calculate.

The decision not to vaccinate a child also involves risk. Choosing not to vaccinate puts the child and others at risk of getting a dangerous disease that could be deadly. For example, children who have not had the measles vaccine are 35 times more likely to get the disease. One out of 20 kids with measles will get pneumonia. About 1 to 3 out of 1,000 children with measles will die from complications. Luckily, we have very few cases of measles in the U.S. because of our high vaccination rates. When enough people are vaccinated against a certain disease, the germs can't be passed as easily from person to person. This is known as community immunity, or herd immunity. Having high numbers of people who are vaccinated in a community keeps the disease from spreading and helps protect people who cannot get vaccinated. While many diseases are no longer in the U.S., disease outbreaks often spread from people traveling to different countries. Read more about this topic in **Chapter 4** and Chapter 6.

Immunizations Prevent the Spread of Disease

It's easy to overlook the benefits of immunizations when we rarely see people sick with vaccine-preventable diseases. However, diseases spread through communities by infecting people who are not protected. Immunizations help to protect a community from these diseases. The number of people vaccinated in a community have a direct effect on whether and how fast a disease will spread. Outbreaks can happen even when a small number of people are not vaccinated or not fully vaccinated. The Vaccinate Your Family organization offers more information about disease outbreaks in the U.S., including information on specific disease outbreaks at the bottom of their web page.

- In 2019, 1,282 measles cases were reported in 31 states. Most of the cases were from outbreaks in New York, and most people were not vaccinated. Of the people who got measles, 128 were hospitalized.
- Mumps cases started to increase in 2015. Between 2016-2017, 150 outbreaks occurred involving over 9,000 cases. Many of the cases were in small communities, on college campuses, schools, church groups, workplaces, and large parties and events.
- In 2012, there were 48,277 cases of whooping cough in the U.S. Washington state also saw high numbers of cases that year. Between 2014-2019, about 120,000 cases were reported. Sadly, about 20 babies still die each year in the U.S. due to whooping cough. About half of babies younger than 1 year old who get whooping cough need treatment in the hospital.

Did You Know?

- The bacteria and viruses that cause disease are still around in our communities even when no one is sick. If your community does not have immunity, the disease can come back.
- We cannot effectively treat or cure many vaccine-preventable diseases.
- Infants and young children tend to get more sick from diseases. They can be hospitalized more often or even die from vaccine-preventable diseases.
- The number of recommended vaccines has increased because we can protect children from more diseases than ever before.
- Vaccines help our bodies create antibodies to fight off serious diseases and strengthen our immune systems. Vaccines prepare our immune systems to defend against serious diseases before we are exposed to them.
- Getting multiple vaccines at once does not overwhelm or weaken the immune system in children. In fact, studies have shown that kids aren't more susceptible to infections after they get vaccinated. Even if a baby gets many vaccines in one day, vaccines are a small piece of what a baby's immune system successfully encounters and manages every day.
- Washington state provides all vaccines for children from birth through 18 years of age at no cost. Health care providers may charge an office visit fee and/or a fee to give the vaccine, called an administration fee. The administration fee can be waived for people who are unable to pay it.

Chapter 2: Facts about Vaccine-Preventable Diseases

This section covers all vaccine-preventable diseases. Check out more details on the Vaccinate Your Family Vaccine-Preventable Diseases eBook or on the Centers for Disease Control and Prevention's (CDC) Vaccines and the Diseases They Prevent web page.

CHICKENPOX (Varicella)

Chickenpox spreads by coughing, sneezing, or having direct contact with fluid from the blisters of a person infected with the virus. People may also get chickenpox by direct contact with a skin lesion from a person with shingles (zoster). People with chickenpox first develop fever, tiredness, and loss of appetite. As the disease develops, it causes a rash that turns into itchy, fluid-filled blisters. These blisters turn into scabs.

Chickenpox can be severe and can cause swelling of the covering of the brain and spinal cord (meningitis). People may also have serious skin infections or pneumonia. If a pregnant person is not immune, exposure to chickenpox during the first 20 weeks of pregnancy can cause serious problems in the fetus, including low birth weight, skin scarring, and swelling of the brain (encephalitis). If a pregnant person is infected with chickenpox from five days before birth to two days after giving birth, it can result in an overwhelming infection in the newborn. This complication has a death rate as high as 30 percent if antiviral medicines are not given.

DIPHTHERIA

Diphtheria is an illness caused a bacteria that produces toxin. There are 2 types of diphtheria illnesses. Respiratory diphtheria affects the throat, nose, and tonsils. Skin diphtheria affects the skin. Common symptoms of respiratory diphtheria may include sore throat, trouble breathing, and low fever. Symptoms of skin diphtheria may include yellow spots or sores on the skin. The toxin created by diphtheria bacteria can damage the heart, kidneys, and nervous system. Diphtheria may cause loss of breathing if the disease blocks the throat. Diphtheria bacteria spreads by coughing, sneezing, or touching infected open sores or ulcers.

COVID-19

COVID-19 is a disease caused by a virus that spreads mostly by coughing, sneezing, or talking. People get sick when they breathe in the particles, or on the virus gets into their eyes, nose, or mouth. COVID-19 often causes respiratory symptoms that feel like a cold, the flu, or pneumonia. COVID-19 may also affect other parts of the body. Some people develop post-COVID-19 conditions, which are collectively called "long COVID." People may have no symptoms and still transmit disease or develop long COVID.

FLU (Influenza)

Flu is caused by a virus that spreads easily by coughing and sneezing. It often causes high fever, cough, headache, and muscle aches. Flu can cause pneumonia, inflammation of the heart or brain, and multi-organ failure. Flu is especially serious for babies younger than six months of age, who often must be hospitalized if they get flu. Flu is also serious for children with chronic illnesses, such as asthma, heart disease, or diabetes. Parents, pregnant people, and caregivers should get vaccinated to prevent spreading the flu to babies who are too young to get the vaccine.

HIB (*Haemophilus Influenzae* Type B)

Hib is a bacteria that spreads by coughing and sneezing. It can cause swelling of the covering of the brain and spinal cord (meningitis), brain damage, infections of the joints, skin, and blood, and even death. Hib is most dangerous to children under five years of age.

HEPATITIS A
Hepatitis A is a virus found in the poop (feces) of infected persons. People with Hepatitis A develop liver disease. Hepatitis A spreads when a person puts food, water, hands, or other objects soiled with infected poop into their mouth. Hepatitis A commonly passes from one person to another through exposure to infected poop from diaper changing and toilet use. It is also spread by eating food that has been handled by an infected person. Hand washing can help prevent the spread of the disease, but it is not 100 percent effective.

HEPATITIS B
Hepatitis B is a virus that spreads by contact with infected blood or other body fluids. Hepatitis B causes serious liver infections and cancer. Most of the time, infected individuals have no symptoms and can spread the virus without knowing it. A mother with hepatitis B can pass the virus to her newborn baby during childbirth. Nine out of ten infants who get infected will develop lifelong (chronic) hepatitis B. Of those, one in four will die of liver problems, such as liver cancer, later in life.

HUMAN PAPILLOMAVIRUS (HPV)
HPV is caused by a virus that spreads mainly through sexual contact. It is the most common sexually transmitted infection in the U.S., with 14 million new HPV infections every year. Most people are first infected in their late teens or early twenties. HPV causes almost all cervical cancers and genital warts. It also causes other types of cancer, like vaginal, vulvar, anal, penile, and mouth and throat cancers. These cancers can be fatal. People infected with HPV usually have no symptoms, so they pass the virus without knowing it.

MEASLES
Measles is a virus that spreads easily by coughing and sneezing. It causes a high fever, cold-like symptoms, and a rash. It can lead to pneumonia, hearing loss, brain damage, and even death. Measles is very contagious, and a child who isn't vaccinated will most likely get measles if exposed.

MENINGOCOCCAL DISEASE
Meningococcal disease spreads by close contact with infected persons by coughing. The disease also spreads through sharing items which touch the mouth, such as water bottles, eating utensils, or toothbrushes. It can cause swelling of the covering of the brain and spinal cord (meningitis), pneumonia, and bloodstream infection. Severe disease can cause brain damage, deafness, loss of limbs, and death.

MUMPS
Mumps is caused by a virus that spreads by coughing, sneezing, or coming into contact with saliva from an infected person. It can cause headache, fever, and swelling of the cheeks, neck, jaw, ovaries, or testicles. Mumps can lead to hearing loss, swelling of the covering of the brain and spinal cord (meningitis), sterility, and brain damage.

PNEUMOCOCCAL DISEASE
Pneumococcal disease spreads by coughing and sneezing. It is the main cause of bacterial meningitis in young children, which causes swelling of the covering of the brain and spinal cord. It can also cause serious bloodstream infections, middle ear infections, and pneumonia.

POLIO
Polio is a virus found in the poop (feces) of infected persons. It spreads when a person puts food, water, hands, or other objects soiled with infected poop into their mouth. Polio can cause permanent paralysis or death. There is no treatment for polio. Polio still happens in other countries and puts travelers at risk.

ROTAVIRUS
Rotavirus is a virus found in the poop (feces) of infected persons. It spreads when a person puts food, water, hands, or other objects contaminated with infected poop into their mouth. Rotavirus is the leading cause of severe diarrhea in infants and children worldwide. Symptoms can include high fever and vomiting, followed by diarrhea. These symptoms can cause the child to become severely dehydrated, which can lead to hospitalization.

RSV (Respiratory Syncytial Virus)
RSV is a virus that spreads by coughing and sneezing, or direct contact with the virus such as touching a surface that has the virus on it. Symptoms usually include a runny nose, low appetite, coughing, sneezing, fever, and wheezing. Some young babies may be irritable, not drink or eat well, and have problems with breathing. Babies, young children, and older adults are at more risk of severe disease.

RUBELLA
Rubella spreads by coughing and sneezing. It causes a fever and a rash on the face and neck. Pregnant women who get rubella can miscarry or have babies with birth defects, such as blindness, deafness, or developmental delays.

TETANUS
Tetanus, also called lockjaw, is caused by a virus. It spreads by entering the body through a cut or puncture wound. Tetanus can cause muscle spasms, breathing problems, and death. Protection from tetanus will always be needed because tetanus lives in the soil and manure and can't be removed. This makes vaccination even more important.

WHOOPING COUGH (Pertussis)
Pertussis, also called whooping cough, is caused by a bacteria. It spreads easily by coughing and sneezing. Whooping cough is most serious for babies under 1 year of age because they are at highest risk for being hospitalized and dying from the disease. Babies may have trouble feeding, breathing, and may turn blue. Babies older than six months and kids with whooping cough often have severe coughing spells that make it hard to eat, drink, breathe, and sleep. Whooping cough can cause pneumonia, seizures, brain damage, and death.

Most babies get the disease from their parents and older siblings. All people living in the same house who have contact with babies should be up to date on their Tdap (whooping cough) vaccine, and all pregnant people should get a Tdap vaccine during each pregnancy early in their third trimester.

Chapter 3: How Vaccines Work

The immune system is the defense mechanism in the body that helps fight disease. When you get infected with a virus or bacteria, your body responds by producing antibodies. These antibodies fight the germs and help you get over the illness. Even after the disease has gone and you are feeling better, your body remembers how to make the right antibodies to protect you if you are exposed to the disease again. This is called immunity. Vaccines work by imitating an infection to stimulate the body to create immunity against the disease. Vaccines give your body a practice run at defending against germs.

Vaccines are the most effective way to build immunity without suffering from an actual infection. You might hear about people preferring to get immunity by getting infected. However, this is risky because many diseases can cause serious, long-term health problems or death. There is no way to know how severe an infection will be. See Chapter 2: Facts about Diseases that Vaccines Prevent for details on specific diseases. Learn more about how vaccines work by reviewing the following links:

- How Do Vaccines Work? - YouTube
- Explaining How Vaccines Work | CDC
- How Do Vaccines Work? | Vaccinate Your Family

Vaccines are often made with viruses and bacteria that are either “live” and weakened, or “killed”. Or they can be made by manufacturing a tiny part of the virus or bacteria. Another type of immunization that helps your body to fight off an infection are monoclonal antibodies. These antibodies work quickly but usually last a short time to protect against a specific disease. Monoclonal antibodies are available to protect infants against severe respiratory syncytial virus (RSV) disease.

The number of vaccine doses needed for protection against a specific disease sometimes depends on whether the vaccine is live or killed. Live vaccines, such as MMR (measles, mumps, and rubella), are very effective and usually provide lifelong protection. However, killed vaccines, like hepatitis A vaccine, usually require more doses to build enough immunity. People often need extra doses or “boosters” of some vaccines to maintain protection throughout their life. An example of this is Tdap vaccine, which protects against tetanus, diphtheria, and whooping cough. There are also some vaccines, such as Flu and COVID-19, which require annual updated doses to protect against different strains of the virus that spread each year.

When scientists worked on ways to fight COVID-19, they adapted a newer technology using messenger ribonucleic acid (mRNA) to make vaccines. These vaccines use mRNA created in a laboratory to teach a person’s cells how to make a protein that stimulates the body to produce antibodies. This helps protect people from getting sick from that germ in the future. For more information about mRNA vaccine technology, check out the links below:

- How mRNA COVID-19 Vaccines Work | CDC
- Understanding How COVID-19 Vaccines Work | CDC
- How vaccines work against COVID-19: Science, Simplified - YouTube

People have many questions about immunizations. Find some helpful resources and some common questions and answers below:

- Talking to Parents About Infant Vaccines | CDC
- Questions About Vaccines? | Vaccinate Your Family
- Vaccine Safety | Vaccinate Your Family

QUESTION: What is community immunity?

ANSWER: Community immunity, also known as herd immunity, helps slow down and stop the spread of disease among groups of people. Community immunity works when most of the population has immunity to the disease. Immunity includes getting vaccinated or by having had the disease. It helps protect people who can’t get vaccinated, like people who have weakened immune systems. For some diseases like whooping cough and measles, at least 9 out of 10 community members must have immunity to stop diseases from spreading.

QUESTION: Do vaccines decrease the immune system’s natural ability to fight disease?

ANSWER: No. A report published by the Immunization Safety Review found that “... multiple vaccinations do not increase the risk of young children developing various infections, ranging from colds and ear infections to pneumonia and meningitis.”

A study of 496 vaccinated and unvaccinated children published in the Journal of Infection found that “children who received immunizations against diphtheria, pertussis, tetanus, Hib, and polio within the first 3 months of life had fewer infections with vaccine-related and -unrelated [bacteria and viruses] than the non-vaccinated group.”

QUESTION: I heard that giving several vaccines at the same time “overloads” the immune system, so it’s better to give them one at a time. Is this true?

ANSWER: No. Getting more than one vaccine at the same time does not harm or overload a child’s immune system. Studies reveal no connection between childhood immunizations and immune system problems. Giving a child several vaccines at the same time doesn’t hurt a healthy immune system.

The immune system of a baby can recognize and respond to millions of different organisms. Scientists estimate that a child could receive up to 10,000 vaccines in one day and still not “use up” their immune response. Getting more vaccines at the same time may also reduce the number of times the child will need to be vaccinated. Over the last 30 years, more combination vaccines have been developed that has reduced the number of vaccinations needed.

QUESTION: Is the method of injecting vaccines harmful for the body?

ANSWER: No. Injecting vaccines is a safe way to get the vaccine into the body. Vaccines are not injected directly into the bloodstream. Most vaccines are injected into the muscle or into the fat layer just below the skin. The syringe and needle are clean and only used once. The items are disposed of in a safe manner, so there is no possibility for spreading infection through an injection.

People get some vaccines by mouth or sprayed into the nose. The method used to give a vaccine is determined by the manufacturer based on testing for safety and effectiveness.

QUESTION: I have heard some people got sick with a disease they were vaccinated for. Is this true?

ANSWER: Yes, but this usually doesn't happen for most vaccines. Even though vaccines are extremely effective, they are not perfect. For example, a vaccine that is 90 percent effective could mean a small number of vaccinated people does not get fully protected from the disease. Every person's body is different, and some people's immune systems may not react strongly to vaccination. The elderly and some people with weak immune systems often need to get additional doses of certain vaccines to get the same immune response. If a person gets infected even though they were vaccinated, the disease tends to be milder than in people who weren't vaccinated. The COVID-19 vaccine was instrumental in reducing hospitalization and death, even though it was not very effective at preventing illness.

When a disease spreads in a community, unprotected people are more likely to be infected. This includes those who did not get vaccinated, and those with a poor immune response to vaccination. Because most diseases that vaccines prevent pass from person to person, those who are vaccinated are less likely to transmit disease. This is why community immunity is so important.

QUESTION: Isn't it true that because of better hygiene and sanitation, diseases began to disappear before the vaccines were introduced?

ANSWER: While better living conditions and hygiene improved our control over some diseases, it wasn't until the introduction of vaccines that we saw a dramatic drop in the number of people who got sick or died from vaccine-preventable diseases. Disease outbreaks still occur because of lack of immunity or immunization.

Diseases such as measles and whooping cough spread very easily no matter the quality of hygiene and living conditions. According to Dr. Jeff Duchin of Public Health – Seattle & King County, "Immunizations have led to a dramatic decrease in serious childhood infections, such as Hib disease, that could not have been accomplished through improvement in sanitary conditions alone."

Here are two examples:

1. The number of cases of Hib, measles, and other diseases that vaccines prevent has decreased dramatically due to immunizations. Once the leading cause of death in young kids, the Hib vaccine was directly responsible for decreasing the rate of Hib disease and Hib cases. Even with modern hygiene and sanitation, Hib disease has dropped more than 99 percent since the vaccine was introduced in 1987.

2. Before the measles vaccine was licensed in 1963, there were 3 to 4 million cases and 400 to 500 deaths from measles in the U.S. every year. Measles cases went down each year until measles was declared eliminated from the U.S. in 2000 thanks to vaccination. While travelers may cause outbreaks, these cases are far below the amount of measles cases we used to have. In the U.S., the largest outbreaks of measles since 1996 have occurred in populations that refuse vaccination for religious or philosophical reasons. Read more about the risks of diseases and vaccination in **Chapter 6: Compare the Risks**.

QUESTION: Is it better to become immune from natural infections rather than through vaccination?

ANSWER: No. Vaccines offer protection against infection without the risk of disease. Vaccines prepare the immune system to defend against serious diseases before we are exposed to them and possibly catch a serious disease that may be deadly. Diseases can cause permanent disabilities, like brain damage from measles or whooping cough (pertussis), and cancer from hepatitis B or HPV infections. Some vaccines, such as tetanus, HPV, and Hib, are better at creating immunity than natural infection is.

QUESTION: Does my baby need vaccinations if I am breast or chest feeding?

ANSWER: Yes. Breast or chest fed babies still need vaccinations. Although human milk provides important temporary protection from some colds, ear infections, and diarrhea, human milk will not protect the baby against all diseases. Also, the immunity from the parent depends on which diseases they are immune from or vaccinated against. Babies need long-term protection from vaccines before they are exposed to diseases. Immunization schedules recommend vaccines early in life for this specific reason.

QUESTION: If I'm pregnant, what vaccines do I need to get to protect my baby?

ANSWER: Pregnant people should get flu, Tdap, COVID-19, and RSV vaccines to protect themselves and their babies from flu, whooping cough, COVID-19, and respiratory syncytial virus (RSV). Getting vaccinated during pregnancy protects the pregnant person and their baby through the first weeks of a baby's life. This is important because pregnant people are at higher risk of getting very sick or dying.

Getting sick from an illness while pregnant can cause preterm delivery. The infection-fighting antibodies from flu, Tdap, COVID-19, and RSV vaccines get passed on to the baby for short-term protection. It also prevents the parent from getting sick and passing disease to their newborn. Babies of parents vaccinated against flu were half as likely to be hospitalized for flu than babies of parents who weren't vaccinated.

Pregnant people should not get the nasal spray flu vaccine. Instead, they should get other flu vaccine options. Pregnant people should get the whooping cough vaccine (Tdap) during each pregnancy. Get the vaccine as early as possible between 27 and 36 weeks of gestation. This is when the vaccine works best to protect the new parent and their newborn from whooping cough.

Family members and others in close contact with a baby should also have their Tdap vaccine. This protects the baby from getting whooping cough. Babies can get very sick if they get a disease, so vaccinated people protect the baby until the baby can get vaccinated.

RSV vaccine is recommended between 32-36 weeks of pregnancy during September through January to protect babies against severe RSV disease.

QUESTION: I heard there is a product to prevent RSV in babies, is this true?

ANSWER: Yes, nirsevimab is a monoclonal antibody product used to reduce severe RSV disease in babies. RSV is a common respiratory virus that can be more serious in infants and older adults, so this is an important product to reduce hospitalization. If the pregnant parent did not receive an RSV vaccine, the newborn should receive nirsevimab during October through March.

QUESTION: Can my premature baby get vaccines?

ANSWER: Yes. Vaccine schedules for preterm babies should be based on their age from birth. By age one to two months, all preterm babies respond as well to vaccines as a baby born full term.

Hepatitis B vaccine may be different for preterm babies. The baby's health care provider will recommend the best schedule if the baby weighs less than 2,000 grams at birth and the parent has hepatitis B.

QUESTION: Do vaccines cause chronic diseases, like diabetes and cancer?

ANSWER: No. We have not found any proof vaccines cause chronic illnesses. This is based on years of vaccine use and research in the U.S. Vaccines are also constantly monitored for safety to make sure it doesn't cause illness. People with certain chronic diseases, such as diabetes, are actually recommended to get vaccinated since they may be at risk for more serious complications from an illness compared to people without diabetes.

Read more about vaccine safety in **Chapter 4**.

Chapter 4: Vaccine Safety

All parents want to do what is best for their kids. Parents get a lot of conflicting information about vaccines from different sources. Learning about how a vaccine gets licensed may help you understand the safety measures in place for vaccines.

The federal agency responsible for licensing vaccines in the U.S. is the Food and Drug Administration (FDA). The FDA has developed scientific tests for approving vaccines. The FDA also monitors vaccines for side effects once they are approved. Read more about their process on their vaccines web page. See a visual of how a new vaccine is created, approved, and monitored on CDC's website.

Licensing Vaccines

Vaccines go through a federal approval process to get licensed. The U.S. Food and Drug Administration's (FDA's) Center for Biologics Evaluation and Research (CBER) is responsible for regulating vaccine use in the United States.

The general stages of vaccine development are:

- Research and Discovery
- Proof of Concept
- Testing the Vaccine
- The Manufacturing Process
- Approving the Vaccine
- Recommending the Vaccine for Use
- Monitoring Safety After Approval

Some people questioned the speed of this process during the COVID-19 pandemic. While the COVID-19 vaccine was approved more quickly than normal vaccines, this was due to the government's ability to speed up the funding and paperwork process. However, the testing process for COVID-19 vaccines remained thorough. For more information, watch the Mayo Clinic's video on "Are the new COVID-19 vaccines safe?"

After vaccines become available, they go through continuous vaccine safety monitoring. Safety monitoring on existing vaccines has been extensive, with many years' worth of data available.

Monitoring Vaccine Safety

The FDA and CDC monitor the safety of vaccines by:

- Performing high-quality vaccine safety research.
- Determining whether vaccines caused reactions.
- Identifying vaccine adverse events through public health surveillance.

Manufacturers test the vaccines they make.

Vaccines are made in batches called "lots," which are tested to make sure each dose remains reliable and safe for use in people. Vaccines are tested in different ways.

- Vaccine manufacturers test all lots of vaccine.
- The FDA checks each lot for safety and quality.
- The FDA regularly inspects manufacturing facilities.
- National systems monitor vaccine side effects.

Many national systems monitor vaccine safety. These systems include CDC's Vaccine Safety Datalink Project (VSD) and the Vaccine Adverse Events Reporting System (VAERS). Watch a video about VAERS here.

Established in 1990, VSD uses large databases to study rare side effects associated with vaccines. Vaccine safety studies need to use large numbers of people because serious side effects are so uncommon. Eight managed care organizations supply CDC with medical records of over 8.8 million people. The records have personal information removed to protect patient confidentiality. This large amount of medical data helps researchers conduct vaccine safety studies. These studies look at the possible relationships between vaccines and adverse events. The VSD has published more than 75 scientific articles addressing immunization safety concerns.

Operated by FDA and CDC, VAERS is a national reporting system that tracks adverse reactions reported after immunizations. Health care providers, patients, parents, or witnesses of a possible adverse reaction can report to the system. Since 1988, vaccine manufacturers and health care providers who give vaccines are required by law to report certain serious adverse events. They may report any reaction or event.

A report or using data reported in VAERS is not proof the vaccine caused the reaction or outcome. VAERS accepts all reports of reactions after vaccination. Some reports to VAERS may be true vaccine reactions, and others may not be related to vaccination at all. Scientists carefully sift through VAERS data to notice potential trends or reasons for reactions. Both the FDA and the CDC monitor VAERS reports.

When people get vaccinations, they receive information about VAERS on their Vaccine Information Statement (VIS). The VIS is offered to all patients before they get vaccinated. The CDC maintains updated versions of all VIS handouts here.

People have multiple ways to get and fill out a VAERS form. Examples include:

- Calling 1-800-822-7967.
- Visiting the CDC VAERS website.
- Contacting your clinic or health department.

QUESTION: Do we know if VAERS works to make vaccines safer?

ANSWER: Yes. A good example is VAERS' monitoring of the Rotashield (rotavirus) vaccine in 1999. Rotavirus is the most common cause of severe diarrhea in infants and children in the U.S. Through VAERS reporting, CDC saw there was an increased risk for a type of bowel obstruction after vaccination with Rotashield. This rare side effect occurred in about 1 in 10,000 children. The vaccine was voluntarily recalled as a direct result of the VAERS data.

When later versions of rotavirus vaccine came out several years later, VAERS data showed the rate of bowel obstruction to be so low that the benefits of the current rotavirus vaccines now outweigh the risks.

QUESTION: What are vaccine "lots"?

ANSWER: Manufacturers make and ship vaccines in groups called "lots." Lot sizes vary between different types of vaccines and manufacturers. The FDA tests samples of each lot for safety, potency, and purity. People can get vaccinated from these lots if the samples pass the FDA tests.

QUESTION: I've heard that there are certain vaccine lots or batches associated with more adverse events. What does this mean?

ANSWER: Vaccine lots range in size from hundreds of thousands of doses to several million. Some lots are in distribution much longer than others. A larger lot or one in distribution for a longer period of time may be associated with more adverse events, simply by chance.

After vaccines are licensed, we can use VAERS data to monitor whether certain vaccine lots have large numbers of reactions or if there are certain types of reactions. However, because vaccine lots are not the same size, differences in the numbers of adverse events reported between various lots must be interpreted with great caution. Some people have misinterpreted VAERS data, leading to unsupported media reports on "unsafe lots" of vaccine. If the number and type of adverse event reports for a vaccine lot suggest serious adverse events or deaths, the FDA would recall it for investigation.

The Washington State Immunization Information System, our statewide immunization registry, also tracks the lot numbers of vaccines. Health care providers who use this registry will know the lot number of each vaccine they give.

More information is available on the CDC website in the vaccine safety section of the CDC Pinkbook, a clinical resource on vaccines.

Chapter 5: Vaccine Ingredients

Every vaccine ingredient serves a purpose, including to provide immunity, keep vaccines safe and long-lasting, and more effective. Ingredients in some vaccines include:

- Stabilizers to keep vaccines effective after manufacturing.
- Adjuvants to help boost the body's response to the vaccine.
- Antibiotics to prevent contamination by bacteria during the manufacturing process.
- Preservatives to prevent contamination, especially in flu vaccine vials that offer multiple doses of vaccine.

QUESTION: Are there additives in vaccines?

ANSWER: Yes, and you should know about them. Additives make sure vaccines are sterile, effective, and safe. Vaccines contain ingredients that help your body build immunity. Some vaccines use tiny amounts of inactive ingredients to remain effective and germ free. No vaccine ingredients have been proven harmful to animals or humans. Read more about vaccine ingredients on the Children's Hospital of Philadelphia web page.

QUESTION: I've heard a mercury-based preservative called thimerosal is in vaccines. Is this true?

ANSWER: A chemical called thimerosal was a popular preservative used in vaccines since the 1940s. Thimerosal has trace amounts of ethylmercury, a type of mercury used to prevent vaccines from becoming contaminated with bacteria or fungi.

Thimerosal is only necessary as a preservative for some vaccines that come in multi-dose vials, which contain more than one dose of vaccine. Preservatives are not needed for vaccines in single-dose vials. All vaccines provided by Washington state for children 6 years and under are free of thimerosal except for flu vaccine in multi-dose vials. A thimerosal-free single-dose flu vaccine is available for those who prefer it.

QUESTION: Why was a recommendation made to remove thimerosal from childhood vaccines?

ANSWER: The recommendation to remove thimerosal from childhood vaccines was made as a precaution. The decision was made by the U.S. Public Health Service, the American Academy of Pediatrics (AAP), and vaccine manufacturers in July 1999. This decision was made to reduce exposure to all sources of mercury in biological products for infants, children, and pregnant people.

QUESTION: Is thimerosal still in the vaccines that my child gets?

ANSWER: Only a couple vaccines still have thimerosal in them. Thimerosal is only used as a preservative in multi-dose vials of flu and Td vaccine. These vaccines are safe, but families can request thimerosal-free versions of them. The flu vaccines in question can be given to children older than three years in Washington state, but families can request single-dose vials without thimerosal. Thimerosal has never been used in live vaccines such as MMR, varicella, and nasal spray flu vaccine.

QUESTION: Is there evidence that thimerosal in vaccines causes autism?

ANSWER: No. In 2004, the Institute of Medicine (IOM) found no proof thimerosal caused autism. Even though thimerosal was removed from U.S. vaccines in 2001, the number of new cases of autism is on the rise. If autism was caused by infants' exposure to thimerosal, then its removal from vaccines would have led to a decrease in autism rates. A decrease would have happened quickly, as autism is usually diagnosed by three years of age. Find more information on the CDC's Thimerosal and Vaccines web page.

The state of California has done a thorough job of tracking autism spectrum disorders both when thimerosal was still used in vaccines and after it was removed. Researchers reviewed trends in autism diagnoses between January 1995 and March 2007 in children born between the years 1989 and 2003. They found that even after thimerosal was removed from vaccines, the number of children with autism continued to rise.

In October 2001, the IOM concluded that the scientific evidence does not support the argument that neurodevelopmental disorders could be caused by a child's thimerosal exposure through vaccines. In 2004, the IOM Immunization Safety Review Committee reviewed a large number of scientific studies, including a study in Denmark involving almost 500,000 children. The IOM made this conclusion: there is no association between autism and vaccines that contain thimerosal.

In addition, the Vaccine Safety Datalink (VSD) project monitors vaccine safety by analyzing medical data from millions of patients in managed care organizations. The CDC has not found evidence that neurodevelopmental disabilities like autism are caused by vaccines containing thimerosal. This finding is consistent with other scientific studies.

For more information on thimerosal, visit CDC's National Immunization Program website, call its English and Spanish hotline at 1-800-232-4636, or call via teletypewriter (TTY) using 1-888-232-6348. For more information about MMR and autism, see the **Chapter 7** Q&A about specific vaccines.

QUESTION: Do vaccines cause autism?

ANSWER: Vaccines do not cause autism. Many studies of millions of children conducted throughout the world over the last ten years have not shown a connection between autism and childhood vaccines. There was one study that claimed to find a connection, but it has been retracted by the publication when it was found that the lead author lied about his findings. This doctor lost his license to practice medicine. Learn more at the Vaccinate Your Family Vaccine Safety web page.

QUESTION: Is aluminum used in vaccines?

ANSWER: Yes. Trace amounts of aluminum salts are used in some childhood vaccines. It's important to know:

- Aluminum is everywhere. It is naturally present in our water, soil, and even air. Nuts, fruits, vegetables, flour, cereal, baby formula and breast milk all have some aluminum.
- There is less aluminum in vaccines than in the amount babies drink in breast milk or formula.
- Aluminum has been safely used in vaccines for several decades.
- Aluminum increases the immune system's response to the vaccine.
- Using aluminum salts reduces the number of doses needed for certain vaccines.

Read more about vaccine additives on page 6 of the article "Clear Answers and Smart Advice About Your Baby's Shots" by pediatrician Dr. Ari Brown.

QUESTION: Why is formaldehyde in vaccines?

ANSWER: Trace amounts of formaldehyde may be left over from the manufacturing process of some vaccines. The formaldehyde in vaccines does not pose a health concern. The amount of formaldehyde is much smaller than what occurs naturally in our environment and our bodies.

Read the CDC's footnote on formaldehyde in vaccines here.

QUESTION: Do vaccines have antifreeze in them?

ANSWER: No. Some vaccines use a chemical called polyethylene glycol, which is used to purify vaccines. Although this chemical can be found in antifreeze, it is also used in toothpaste, eye drops, and skin care creams.

Read the answer to this question and others from the pediatrican website healthychildren.org.

QUESTION: My child has a peanut allergy and I've heard that vaccines are suspended in peanut oil. Is this true?

ANSWER: No. No vaccines are made with, or suspended in, peanut oil. Vaccines do not pose a risk to children with peanut allergies.

Chapter 6: Compare the Risks

This chapter compares the risk of a specific disease to the risk of reactions from the vaccine that prevents it. The likelihood of a serious vaccine reaction is extremely low. The risk of serious reaction to a routinely recommended childhood vaccine is even less than one in one million. As with any medicine, there is a very small chance that a vaccine may cause a severe allergic reaction.

Resources:

- Pinkbook: Epidemiology of Vaccine Preventable Diseases | CDC
- Possible Side Effects From Vaccines | CDC
- Vaccines and the Diseases They Prevent | CDC
- Vaccine Information Statements | CDC
- Vaccine Safety | Vaccinate Your Family

Risk of Disease and of Serious Complications	Risk of Reactions from Vaccine
Chickenpox (Varicella) • Complications include skin and blood infections, pneumonia, and swelling of the brain. Infected skin lesions are the most common cause of hospitalization and can lead to death. Brain swelling can cause seizures or coma. • The virus can come back later in life as shingles (herpes zoster). • The disease is more severe in babies, adolescents, adults, pregnant people, and those with weak immune systems.	**Chickenpox (Varicella) Vaccine** • People may have pain, soreness, swelling, redness where the shot is given. • Fever, and a rash similar to chickenpox may occur. • Very rarely, people may get pneumonia, infection of the brain or spinal cord covering, or seizures associated with fever.

Risk of Disease and of Serious Complications	Risk of Reactions from Vaccine
COVID-19 • Common symptoms include fever, cough, feeling tired, muscle pain, headache, loss of taste or smell. • Severe complications can include long COVID, pneumonia, inflammation of the heart or lining of the heart, multisystem inflammatory syndrome, organ failure, acute respiratory distress, and death.	**COVID-19 Vaccine** • People may have soreness, swelling, or redness where the shot is given, feeling tired, headache, muscle pain, chills, nausea, or fever. • Very rarely, inflammation of the heart may occur, and most patients recover quickly.
Diphtheria • The toxin released by diphtheria bacteria causes serious complications. Complications include airway blockage, damage to the heart muscle, nerve damage, kidney failure, and death.	**DTaP, Tdap, or Td Vaccine** • People may have soreness or swelling where the shot is given, fever, feeling tired, loss of appetite, and vomiting. • Seizures, crying, or high fever happen less often. • Rarely, there may be swelling of an arm or leg, especially in older children who may have multiple vaccine doses.
***Haemophilus influenzae* type b (Hib)** • Infections in the blood may cause loss of limbs. • Meningitis related to Hib infection may cause brain damage or hearing loss.	**Hib Vaccine** • People may have redness, warmth, and swelling where the shot is given, and fever.
Hepatitis A • Common symptoms include fever, feeling tired, nausea, stomach pain, dark urine, and yellow skin and eyes (jaundice). • Symptoms usually resolve in 2-3 months, but some people may be ill for 6 months. • Can cause liver failure and death.	**Hepatitis A Vaccine** • People may have soreness or redness where the shot is given, fever, headache, feeling tired, loss of appetite.

Risk of Disease and of Serious Complications	Risk of Reactions from Vaccine
Hepatitis B • Common symptoms include nausea, lack of appetite, feeling tired, muscle, joint, or stomach pain, fever, diarrhea or vomiting, headache, dark urine, and yellowing of the skin and eyes (jaundice). • People who have life-long disease may progress to have severe scarring of the liver, liver cancer, liver failure, or death.	**Hepatitis B Vaccine** • People may have soreness where the shot is given, or fever.
Human Papillomavirus (HPV) • Over 42 million people are infected with the types of HPV that cause disease. Most of these first infections are in 15- to 24-year-olds. • About 14 million people are infected for the first time in the U.S. each year. • More than 12,000 women get cervical cancer each year. • 6,000 men and women get anal cancer each year. • 16,400 men and women get mouth or throat cancer each year. • About 4,000 women die of cervical cancer, and over 700 people die of anal cancer every year. • HPV causes almost all cervical cancer, 90% of anal cancer, and many other cancers.	**HPV Vaccine** • People may have soreness, redness, or swelling where the shot is given. • Fever or headache.

Risk of Disease and of Serious Complications	Risk of Reactions from Vaccine
Influenza (flu) • Second most frequent cause of death related to a vaccine-preventable disease in the U.S. • Risk of complications, hospitalization, and death higher in older adults, children younger than 5, pregnant people, and anyone with medical conditions that increase their risk for complications. • Common symptoms include fever, chills, cough, sore throat, runny nose, muscle or body aches, headaches, and feeling tired. • Severe complications include ear and sinus infection, pneumonia, inflammation of the heart, brain, or muscle tissues, and multiple organ failure.	**Influenza Vaccines** • People may have soreness, redness, and swelling where the shot is given, fever, muscle aches, and headache. • Slightly higher risk of neurologic conditions, including Guillain-Barré Syndrome (GBS). • Young children who get the flu shot along with pneumococcal vaccine and/or DTaP vaccine at the same time may be slightly more likely to have a seizure caused by fever. • People who get FluMist, a nasal spray, may have runny nose or congestion, wheezing, headache, vomiting, muscle aches, fever, sore throat, or cough.
Measles • Common symptoms include high fever, cough, runny nose, and red, watery eyes. • Complications include ear infections, diarrhea, hospitalization, pneumonia, swelling of the brain, complications for pregnant people, and death.	**MMR Vaccine** • People with serious immune system problems or who are pregnant should not get MMR vaccine. • People may have a sore arm or redness where the shot is given, fever, and a mild rash. • Rarely, people may have swelling of the glands in the cheeks or neck. Teens or adult women are more likely to have temporary pain and stiffness in the joints. • More serious reactions may happen rarely, including seizures (often with fever) or a temporary low platelet count that can cause bleeding or bruising.

Risk of Disease and of Serious Complications	Risk of Reactions from Vaccine
Meningococcal Disease • Common symptoms include fever, headache, stiff neck, nausea, vomiting, eye sensitivity to light, and confusion. • Babies may be slow or not as active, irritable, feed poorly, or have a bulging soft spot on the skull. • 1 in 5 survivors may have limb loss, deafness, nervous system problems, and brain damage.	**Meningococcal Conjugate Vaccine/ Meningococcal B Vaccine** • People may have redness or soreness where the shot is given, muscle pain, headache or tiredness.
Mumps • Common symptoms include fever, headache, muscle pain, feeling tired, or loss of appetite. • Complications can include inflammation of the testicles, ovaries, breasts, pancreas, brain, and deafness.	**MMR Vaccine** • People with serious immune system problems or who are pregnant should not get MMR vaccine. • People may have a sore arm or redness where the shot is given, fever, and a mild rash. • Rarely, people may have swelling of the glands in the cheeks or neck. Teens or adult women are more likely to have temporary pain and stiffness in the joints. • More serious reactions may happen rarely, including seizures (often with fever) or a temporary low platelet count that can cause bleeding or bruising.
Pneumococcal Disease • Common symptoms include fever and chills, cough, faster breathing or problems breathing, and chest pain. • Complications include ear infection, sinus infection, swelling of the covering of the brain and spinal cord, blood infection, ear infections, pneumonia, brain damage, and death.	**PCV Vaccine** • People may have redness, swelling, pain, or soreness where the shot is given, fever, loss of appetite, feeling tired, headache, muscle aches, joint pain, and chills. **PPSV Vaccine** • People may have redness or pain where the shot is given, feeling tired, fever, or muscle aches.

Risk of Disease and of Serious Complications	Risk of Reactions from Vaccine
Polio • Many people will not have any symptoms. Some people may have symptoms, including sore throat, fever, feeling tired, nausea, headache, and stomach pain. • Complications include an infection of the covering of the spinal cord or brain, paralysis, and death.	**Inactivated Polio Vaccine (IPV)** • People may have redness, swelling, or pain where the shot is given.
Rotavirus • Common symptoms include vomiting, watery diarrhea that can last 3-8 days, lack of appetite, and dehydration.	**Rotavirus Vaccine** • People may have irritability or fussiness, fever, mild and temporary diarrhea, or vomiting. • Bowel obstruction is very rare, about 1 in 100,000 doses.
RSV in Adults • Common symptoms include runny nose, decrease in appetite, cough, sneezing, fever, and wheezing. • Complications include an inflammation of the small airways in the lung and pneumonia. People may be hospitalized to get oxygen or other treatments to help them breathe. • RSV can be life threatening for older adults.	**RSV Vaccine for Adults and Pregnant People** • People may have pain, redness, and swelling where the shot is given, feeling tired, headache, muscle pain, nausea, and diarrhea. • Very rarely, vaccination may cause neurologic conditions including Guillain-Barré Syndrome (GBS).

Risk of Disease and of Serious Complications	Risk of Reactions from Vaccine
RSV in Infants • Common symptoms include runny nose, eating or drinking less, and cough. The cough may progress to wheezing or problems breathing. • In very young infants, symptoms include less activity, crying more, eating or drinking less, and pauses in breathing for more than 10 seconds. • Complications include inflammation of the airways in the lung and pneumonia.	**RSV Monoclonal Antibody for Infants (nirsevimab)** • People may have pain, redness, or swelling where the shot is given, and rash.
Rubella • Common symptoms include a rash that starts on the face and progresses to the body, fever, headache, mild redness or swelling of the white of the eye, swollen lymph nodes, cough, and runny nose. • Complications include arthritis, brain infection, and bleeding problems. • Rubella infection during pregnancy can cause a miscarriage or the baby's death after birth. If the virus is passed to the developing baby, can cause birth defects such as heart problems, loss of hearing and vision, intellectual disability, and liver or spleen damage.	**MMR Vaccine** • People with serious immune system problems or who are pregnant should not get MMR vaccine. • People may have a sore arm or redness where the shot is given, fever, and a mild rash. • Rarely, people may have swelling of the glands in the cheeks or neck. Teens or adult women are more likely to have temporary pain and stiffness in the joints. • More serious reactions may happen rarely, including seizures (often with fever) or a temporary low platelet count that can cause bleeding or bruising.
Shingles (Zoster) • Early symptoms include pain, itching, or tingling in the area where the rash develops. • Common symptoms include an itchy and painful rash on one side of the face or body, fever, headache, chills, and upset stomach. • Complications include infection of the rash, pneumonia, hearing problems, brain inflammation, and death.	**Shingles (Zoster) Vaccine** • People may have mild or moderate pain, redness, and swelling where the shot is given, feeling tired, muscle pain, headache, shivering, fever, stomach pain, and nausea. • Very rarely, vaccination may cause Guillain-Barré Syndrome (GBS).

Risk of Disease and of Serious Complications	Risk of Reactions from Vaccine
Tetanus • Common symptoms include jaw cramping or spasms, painful muscle stiffness all over the body, trouble swallowing, seizures, headache, fever and sweating, and changes in blood pressure and heart rate. • Complications include tightening of the vocal cords, fractures of the bones, blockage in the lung caused by a blood clot, lung infection, and life threatening problems with breathing.	**DTaP, Tdap, or Td Vaccine** • People may have soreness or swelling where the shot is given, fever, feeling tired, loss of appetite, and vomiting. • Uncommon side effects include seizures, crying, or high fever. • Rarely, side effects may include swelling of an arm or leg, especially in older children.
Whooping Cough (pertussis) • Common symptoms include runny nose, fever, pause in breathing or turning blue or purple in babies and young children, coughing fits with vomiting, and problems breathing. • Some babies may need treatment in the hospital. Other complications include pneumonia, seizures, infection of the brain, and death.	**DTaP, Tdap, or Td Vaccine** • People may have soreness or swelling where the shot is given, fever, feeling tired, loss of appetite, and vomiting. • Uncommon side effects include seizures, crying, or high fever. • Rarely, side effects may include swelling of an arm or leg, especially in older children.

Chapter 7: Questions and Answers about Specific Vaccines

CHICKENPOX (Varicella)

QUESTION: Chickenpox doesn't seem very serious. Why should I vaccinate against it?
ANSWER: While chickenpox may be mild or moderate for many, it can lead to life-threatening complications for people who have weak immune systems. Chickenpox disease can cause pneumonia, swelling of the brain called encephalitis, "flesh-eating" bacterial infection, shingles later in life, and death. Before varicella vaccine became available in 1995 in the U.S., about 4 million people got chickenpox every year. Over 10,500 of those people were hospitalized, and about 100-150 people died each year from chickenpox. Most of the hospitalizations and deaths occurred in previously healthy children. Since 1996, hospitalizations and deaths from chickenpox disease have decreased more than 90 percent. Vaccinating against chickenpox during childhood helps reduce the chance of getting the disease in later years.

DIPHTHERIA, TETANUS, AND ACELLULAR PERTUSSIS

QUESTION: How effective is the DTaP vaccine?
ANSWER: Children get four DTaP doses for disease protection by age 18 months. The fifth dose, given between 4 to 6 years of age, completes protection. A full series of shots protects about 80 out of 100 children from getting severe whooping cough, 95 out of 100 children from getting diphtheria, and everyone from getting tetanus. Children vaccinated with DTaP who become ill with whooping cough almost always have a milder illness compared to unvaccinated children. Consider these facts:

- Whooping cough is so contagious that almost everyone who is not immune will get sick if exposed to it.
- Children and young infants who catch whooping cough often become seriously ill.
- Children who are not fully immunized often get and spread whooping cough to others in their communities.

Most kids who have had a full series of DTaP vaccine are protected from diphtheria, tetanus, and severe pertussis for several years. Protection wanes over time, which is why everyone 11 years and older should get a pertussis booster dose with Tdap vaccine. Every 10 years after, people should get a booster dose of the Td or Tdap vaccine to continue protection against tetanus and diphtheria. Tdap vaccine protects against the same diseases as DTaP vaccine, but it has a different amount of vaccine in it that's better suited to older children and adults.

HEPATITIS B

QUESTION: I know that most people who get hepatitis B are adults. Why is it recommended that the hepatitis B vaccine series be given to infants?
ANSWER: Vaccinating all infants against hepatitis B is recommended because a person with hepatitis B can pass the virus to their newborn baby during childbirth. Nine out of ten infants who get infected this way will develop lifelong hepatitis B. Of those, one in four will die of liver problems later in life.

It is impossible to predict who will be exposed to hepatitis B in the future. About 30 percent of those who get hepatitis B do not have symptoms and do not know how they got the disease. Infection can occur as a result of bites, scratches, or contact with blood from an infected playmate or family member.

Babies and very young children are much more likely to develop a severe case of hepatitis B, often leading to death later in life. The earlier in life a child is exposed to the disease, the more likely he or she will become a chronic (lifelong) carrier with an increased risk for liver cancer. Prevention is best. Getting hepatitis B vaccine early in life helps ensure people are protected before they are exposed to the virus.

QUESTION: Are there any concerns with my baby getting hepatitis B vaccine at birth and an extra dose in a combination vaccine?

ANSWER: Giving the hepatitis B vaccine within 24 hours of birth offers extra protection for babies before exposure to the virus occurs. Babies are also recommended to get a combination vaccine that contains hepatitis B vaccine, which results in an extra hepatitis B vaccine dose. Getting vaccines combined into one shot offers many benefits, including fewer shots, less pain and discomfort, fewer visits, and less time off from work or family activities. Having the extra dose of vaccine is safe and does not cause more side effects for your child.

HUMAN PAPILLOMAVIRUS (HPV)

QUESTION: Why should my child get HPV vaccine at age 9 rather than wait until age 11?

ANSWER: The HPV vaccine is most effective at this age because it provides better immunity when given at younger ages. Vaccine effectiveness drops when vaccination occurs above age 13. Getting vaccinated provides protection against many types of cancer. Getting the vaccine at age 9 also ensures immunity is in place before children are exposed to the virus. And since it works better at this age, someone who starts the vaccine series between ages 9 and 14 only need two doses instead of three. Starting the series at age 9 makes it easy for your child to get all the doses they need by their age 11 well-child visit, when other vaccines will be given.

QUESTION: Does the HPV vaccine protect my child against all HPV diseases and cancers?

ANSWER: The vaccine protects against nine of the most common cancer-causing strains of HPV and can prevent over 90% of HPV-related cancers. There are about 100 different types of HPV. Of those, at least 40 types can cause genital warts and several kinds of cancer, especially cancers of the cervix, throat, anus, mouth, and penis.

INFLUENZA (Flu)

QUESTION: Does my baby need flu vaccine?

ANSWER: Yes. The Advisory Committee on Immunization Practices (ACIP) recommends everyone six months and older get a flu vaccine every year. Infants and children younger than five years old are more likely to have serious illness, complications, and be hospitalized from the flu. Household members and caregivers should also get flu vaccine each year. Your infant or child may need two doses of flu vaccine the first time they get it, so check with your health care provider. For more information about flu recommendations, visit the Department of Health's Flu web page.

QUESTION: Are there different types of flu vaccine?

ANSWER: Yes. There is a vaccine that is given as a shot, and a vaccine that is sprayed into both nostrils. The first flu vaccine contains killed viruses and can be given to anyone six months and older. Pregnant people can only get this type of vaccine. The spray flu vaccine is a weakened live virus vaccine.

Neither flu vaccine types can cause disease in people. Flu vaccines help a person to produce an immune response to the flu virus, but can't cause the disease.

QUESTION: Can I get the flu vaccine when I'm pregnant?

ANSWER: Yes. The flu shot is recommended for all pregnant people and those who recently gave birth. Getting vaccinated during pregnancy offers infants some protection at the time of delivery and up to six months after they're born. The CDC and the Washington State Department of Health strongly encourage every pregnant person to get a flu shot. Pregnant people should not get the nasal spray vaccine.

MEASLES, MUMPS, AND RUBELLA (MMR)

QUESTION: Is there an association between the MMR vaccine and autism*?

ANSWER: No. Studies show that the development of autism is not related to the use of MMR or any other vaccine. Experts in behavioral and developmental disorders agree genetics play a role in causing autism, and current research shows that there is more than just one "autism gene." Other things scientists are researching as possible causes of autism are abnormal brain growth, environmental exposure, premature birth, older parents, and pregnancies that are close together. For more information, read the article "Clear Answers and Smart Advice About Your Baby's Shots" on the Immunize.org website.

The idea that there is a link between the measles, mumps, and rubella (MMR) vaccine and autism came from one small report of only eight children conducted in England in 1998 that has been retracted. This led a research group to feel that there was a link between the MMR combination vaccine and autism. This report turned out to be completely false. A former member of the research lab revealed that the data reported in the study were made up. In 2004, the report was retracted by the journal that published it. In 2010, the lead author lost his license to practice medicine and was accused of fraud.

In 2008, a team of researchers tried and failed to duplicate the findings of this study. A large number of studies and reviews including more than ten million children shows no connection between the MMR vaccine and autism.

Because of this false study, some parents chose to skip the MMR vaccine. Since then, measles epidemics continue to occur in both the U.S. and the United Kingdom. Read more information about the measles epidemic in **Chapter 1**. Dr. Ari Brown, a pediatrician and coauthor of the 411 parenting book series, summarizes the problem:

"Don't base health decisions for your child on one research study or what the media says. Talk to your child's doctor about any vaccine safety concerns."

**By autism, we mean autism spectrum disorder or ASD, a collection of several disorders with three areas that can be affected: social skills, communication skills, and repetitive or obsessive traits. ASD can be mild, severe, or anywhere in between. A child with Asperger syndrome, for example, which falls under ASD, can communicate but has trouble with social skills. A child with more severe problems in all three areas may have classic autism. Cases with more severe symptoms are more likely to be caught earlier than milder forms of ASD, such as Asperger syndrome.*

QUESTION: If the MMR vaccine doesn't cause autism, why is the diagnosis made around the same time as the vaccination?

ANSWER: Because they happen around the same time, some parents wonder if there is a connection between autism and the vaccine. However, there is no connection. One of the main

symptoms of autism is a delay in language skills. Because children develop language at different rates, the language delay of children with autism is sometimes not apparent until they are 15 to 18 months old. MMR vaccine is usually given to children 12 to 15 months of age, so by chance some children with autism are diagnosed with the disorder in the weeks or months after MMR vaccination. This does not mean that the vaccine caused the disorder. Some research is showing that in some cases, subtle signs of autism can be detected in the first year of life – before the ages that most children receive MMR vaccine.

QUESTION: Can I get measles, mumps, and rubella as separate shots instead of the combined MMR vaccine?

ANSWER: No. Measles, mumps, and rubella are no longer available as separate vaccines. Separating vaccines has no benefit and is not recommended because protection for the diseases gets delayed. This is risky for children and the community. Delaying the rubella vaccine during pregnancy leaves unborn babies at risk. Kids who are not vaccinated can spread the disease to pregnant people, which can cause miscarriage or babies born with congenital rubella syndrome (CRS). CRS can cause birth defects like blindness, deafness, or developmental delays.

MENINGOCOCCAL DISEASE (MenACWY, MenB, MenABCWY)

QUESTION: Are there different meningococcal vaccines?

ANSWER: Yes. There are three types of meningococcal vaccine. Meningococcal conjugate vaccine (MenACWY) is recommended for all children 11 to 12 years old and for children and adults at increased risk for meningococcal disease. A booster dose is given at age 16 for all teens. Another type of vaccine protects against the meningococcal B strain. This vaccine is recommended for people 16 through 23 years old and people 10 years or older at higher risk for the disease. The MenABCWY vaccine is another option for people 10 years or older who are getting both MenACWY and MenB vaccines at the same visit. More information can be found on the CDC's Meningococcal Vaccines web page.

QUESTION: Is there a higher risk for getting Guillain-Barre syndrome (GBS) with the meningococcal vaccine than without the vaccine?

ANSWER: No. GBS is an autoimmune disorder that causes nerve damage and can lead to muscle weakness and paralysis. Several years ago, when a few people reported they got GBS after getting the MCV4 meningococcal vaccine, two large safety studies were done to investigate. They found the rate of GBS was the same among people who had gotten the vaccine as among those who were not vaccinated. No evidence showed the vaccine caused GBS, and it is safe to get the vaccine even if you've had GBS in the past. CDC continues to carefully monitor reported vaccine data for GBS cases.

PNEUMOCOCCAL DISEASE (PCV, PPSV)

QUESTION: Are there different pneumococcal vaccines for children?

ANSWER: Yes. A pneumococcal conjugate vaccine (PCV) is recommended for all children under 5 years of age and children 2 through 18 years old with certain medical conditions. There are multiple PCV vaccines, called PCV13, PCV15, and PCV20. These vaccines target the most common types of pneumococcal infection that cause severe disease. PPSV23 is another type of pneumococcal vaccine licensed for children ages 2 and older who have specific risk factors for pneumococcal disease. Your healthcare provider uses age and the presence of certain health conditions to recommend which vaccine is best.

In the past, pneumococcal infections could be treated effectively with certain antibiotics. However, many of these infections are becoming resistant to antibiotics, which makes vaccination more important. More information is available on the CDC's Pneumococcal Vaccines web page.

POLIO

QUESTION: Is it still necessary to be immunized against polio?

ANSWER: Yes, many parents today don't know about this terrible disease that caused many children to be paralyzed in the 1940's and 1950s. Although it is no longer a threat in the US, polio still exists in other countries. Until polio is eliminated worldwide, our children need to be protected. Because international travel is common, polio can spread across countries. In 2022, New York reported one case of polio in someone who was not vaccinated, showing that polio remains a risk across the world.

QUESTION: What is the difference between inactivated poliovirus vaccine and oral poliovirus vaccine?

ANSWER: The inactivated polio vaccine (IPV) is a killed form of the virus and given as a shot. The oral polio virus vaccine (OPV) uses a live but weakened form of the virus and is given by mouth. IPV is currently the only polio vaccine available in the U.S. Because polio no longer exists in the U.S. and other countries in the western hemisphere, IPV has been the only vaccine given and recommended in the U.S. since January 2000.

OPV was the vaccine of choice for routine immunization of most children in the U.S. from 1963 to the mid-1990s. It is highly effective at preventing polio, but it is associated with a very rare occurrence of paralysis in people who received the vaccine as well as in those with whom they had contact. Approximately eight cases of vaccine-associated paralytic polio (VAPP) occurred in the U.S. each year when OPV was the primary vaccine in use. This happened in 1 case per 2.5 million doses. The currently used vaccine, IPV, cannot and does not cause VAPP because it does not contain live poliovirus.

ROTAVIRUS (RV)

QUESTION: Is rotavirus disease just a kids' illness?

ANSWER: Adults can be infected with rotavirus, but they tend to have milder symptoms. Children between 6 and 24 months old are at greatest risk for severe rotavirus disease because it can cause dehydration.

QUESTION: What is intussusception? Is there a risk for this condition with the rotavirus vaccine?

ANSWER: Intussusception is a rare bowel obstruction that causes one part of the intestine to slide into the next, much like the pieces of a telescope. Current studies have not shown an increased risk of bowel obstruction in babies getting the vaccine compared to babies not vaccinated. For more information, see **Chapter 4** on vaccine safety. A previous rotavirus vaccine had a slight risk of intussusception, but it was taken off the market in 1999 when this risk was discovered.

QUESTION: What are the legal requirements for immunizing children?

ANSWER: Federal law requires that parents or guardians must have information in writing about the benefits and risks of vaccination before their child is vaccinated. This is done by providing parents or guardians a Vaccine Information Statement for each vaccine. In addition, parents or guardians are given an opportunity to ask questions and get information about vaccinations.

There are also legal requirements to vaccinate children attending school, preschool, and child care. States develop these requirements because they have a responsibility to protect the health of the public and individuals. Each state determines which vaccines are required by law. For more information about vaccines required in Washington state, visit the School and Child Care Immunizations Information for Families web page.

State law requires parents or guardians to provide a Certificate of Immunization Status (CIS) before a child can attend a licensed child care, preschool, or school. The CIS form shows a child's official immunization records. Families can get a CIS filled with a child's immunizations from a health care provider, a school, or the Department of Health.

Parents who want to exempt, or excuse, their child from immunization requirements must fill out a Certificate of Exemption (COE) form. All exemptions require a parent or guardian signature. For most exemptions, a licensed health care provider in the state must sign the COE and provide the parent or guardian with information about the benefits and risks of vaccination.

A child who has an exemption for immunization requirements may be excluded from attending childcare, preschool, or school during disease outbreaks.

Be sure to keep a record of your child's immunizations. You can get your child's immunizations online at myirmobile.com.

QUESTION: Why don't the vaccine requirements for school entry match the current vaccines listed in the recommended Childhood Immunization Schedule?

ANSWER: The Advisory Committee on Immunization Practices' (ACIP) Recommended Childhood Immunization Schedule lists recommended vaccines for childhood. Some recommended vaccines protect against diseases that are most serious to infants and toddlers, like *Haemophilus influenzae* type b and pneumococcal disease. These diseases do not pose as great a threat to school-age children and therefore are not required for school entry, but are required for child care and preschool.

Families should protect babies and young children against the most common diseases before they start school. Families should follow the recommended immunization schedule for the best protection against disease.

Chapter 8: Legal Requirements

Parents often ask why immunizations are given so early in life. You may wonder if you can wait until your child enters school to get required immunizations. You may also wonder about the risk if your child does not receive all recommended immunizations. The following questions and answers cover this information.

QUESTION: Who determines the U.S. recommended Immunization Schedules? Why should I follow them?

ANSWER: The Advisory Committee on Immunization Practices (ACIP) develops a recommended schedule for children (as well as teens and adults) in the U.S. ACIP is a Centers for Disease Control and Prevention (CDC) committee of medical experts that meet to review research about the safety, effectiveness, and best timing for the vaccine. Vaccines in the immunization schedule must be proven safe and effective before they're recommended.

The goal of the recommended schedule for children is to protect them as soon as it is safe and effective to do so. There is no research showing that delaying any shots is safer. Delaying shots also means not protecting your child from diseases. Many of these shots are given at a time when children may be most at risk for those diseases. For example, rotavirus vaccine is given soon after birth because rotavirus poses the most danger to infants and very young children.

Some parents choose to use an alternative immunization schedule for their child. These alternative schedules are not supported by research.. In other words, they have never been tested scientifically. Read more on immunize.org's article, Clear Answers and Smart Advice About Your Baby's Shots.

QUESTION: What happens if I wait to immunize my child until he or she is ready to start school?

ANSWER: Your child is not protected against serious diseases. Many diseases that vaccines prevent are more severe and may cause complications in infants and very young children. Delaying immunizations until kindergarten or even until after the first birthday can put your child at unnecessary risk when they are most vulnerable. Compare this to car seat or seatbelt use. Your child might not get hurt riding in a car without a car seat or seatbelt. However, research shows that not using these safety devices puts your child at greater risk of injury or death. Riding in a car is a risk, but you can make choices that decrease that risk. The same is true for diseases that vaccines prevent. Vaccines decrease your child's risk of serious illness and death.

QUESTION: If my baby is born with immunity from the parent, why should I vaccinate in the first year?

ANSWER: It's important to vaccinate your baby in the first year of life to protect them from serious diseases. Some important reasons include:

- Antibodies from the parent are only temporary. These antibodies decrease during the first year of life.
- Antibodies are only passed on to the newborn if the parent has immunity against specific diseases.
- Research shows children are at high risk to disease during the first years of life.
- Babies will likely be exposed to many other children and adults in the first year of life who may be infected with these diseases.

Chapter 9: To Wait Or Not To Wait

QUESTION: Can my child catch up if he or she is behind on getting immunized?
ANSWER: Yes. If your child is behind on the immunization schedule, talk to your child's doctor, nurse, or clinic about vaccines needed to catch up. They will make a new schedule to get your child caught up as soon as possible. Pharmacies are also a convenient way to get those needed vaccines. Your child does not need to start the series over for any vaccine. However, until your child gets the recommended vaccine series, your child will not have the maximum protection against it.

Some vaccines, such as rotavirus and Hib, cannot be given or are not needed if they are not started or completed by a certain age. It is best to follow the recommended schedule as closely as possible.

QUESTION: Can my child get immunizations even if he or she has a minor illness?
ANSWER: Yes. Immunizations can be given during any visit to your doctor or nurse, even if your child has a minor illness, such as a mild fever, cold, ear infection, diarrhea, or is taking antibiotics. The vaccines will not make your child's illness worse, and the vaccines will still be effective.

Studies show that minor illnesses, body temperature, and the use of antibiotics do not affect the vaccine's effectiveness, and that young children with these mild illnesses respond just as well to the vaccines as children who are vaccinated while they are healthy. Read more at CDC's Vaccines When Your Child is Sick web page.

Getting all immunizations when they are due is an important way to get the best protection, complete each vaccine series on time, and avoid extra visits.

QUESTION: Are there times that vaccines should NOT be given?
ANSWER: Yes. Sometimes a child has medical reasons for delaying or not getting a vaccine. These reasons are called "contraindications" and "precautions." **Contraindications** are medical conditions that increase the chance of a serious adverse reaction. **Precautions** are temporary medical conditions that might increase the chance of an adverse reaction or make the vaccine less effective.

Contraindication example: If a child has a severe allergy to a vaccine component like neomycin or gelatin, then they may experience difficulty breathing, low blood pressure, or shock from vaccination.

Precaution example: If a child has recently received a blood product like immune globulin or a blood transfusion, then the antibodies in the blood could decrease the effectiveness of a live vaccine, such as measles vaccine (MMR). After a certain period of time, the child can get vaccinated normally.

As we mentioned above, vaccines may be given if a child is breast or chest fed, taking antibiotics, or has diarrhea, mild fever, a cold, an ear infection, or other mild illness. The vast majority of children with food allergies may safely receive vaccines. Infants or children living in a household with a pregnant person may receive all vaccines, including live vaccines like MMR and varicella. However, if a child is moderately to severely ill, postponing vaccination may be a good idea. Talk to your doctor if you have questions about what "moderately to severely ill" means in terms of immunization, or if you have specific questions about vaccinating.

QUESTION: I am worried about my baby getting too many shots at once and I am nervous about some vaccines. Our pediatrician prefers to follow the recommended schedule but has agreed to adjust the schedule for our family. What do I need to consider and what should I do next?
ANSWER: It can be hard to see your baby get shots, but the recommended schedule is the safest and fastest way to give your baby protection against several diseases.

Here are some things to consider:

- Using combination vaccines reduces the number of shots given at one time.
- Some diseases are more serious for infants than older children.
- Adjusting the schedule may lead to more visits to your doctor or nurse, as well as repeated discomfort for your child.

Before making a decision:

- Educate yourself about the diseases. Read **Chapter 6: Compare the Risks**.
- Protect your unimmunized baby by encouraging everyone who spends time with your baby to vaccinate.
- Continue to discuss your decision with your doctor or nurse at each visit.

Chapter 10: Adolescent Health Visits

As a child grows, it is important to have regular health visits. These visits assure children are meeting normal growth milestones, keeping healthy, and monitored for any health issues.

As kids get older, some vaccine protection can wear off and they will need a “booster dose” of vaccine, such as tetanus vaccine. A booster dose is a single dose of vaccine given to boost protection against disease, and is only needed for certain vaccines. Having regular visits assures your child follows the recommended vaccine schedule.

A wellness visit at 11 to 12 years of age is recommended In order to protect teens and young adults from serious diseases. Teens and young adults are at higher risk for meningitis, HPV, and whooping cough. This is because they begin to engage in activities such as sharing drinks and utensils, kissing, attending summer camps, and going to college. Vaccines for these diseases are recommended during teenage years. While it is often difficult for families to get regular health visits for their teens, it is still important to make sure they are healthy and protected.

QUESTION: Which vaccines are recommended for preteens and teens?
ANSWER:

- HPV vaccine is recommended beginning at age 9. HPV vaccine protects against cancers caused by human papillomavirus.
- Tdap vaccine is recommended at age 11. Tdap protects against tetanus, diphtheria, and pertussis (whooping cough).
- Meningococcal vaccines are recommended beginning at age 11 to 12. Meningococcal vaccine protects against meningococcal disease.
- Flu vaccine is recommended every year.
- COVID-19 vaccine is recommended.

Teens should also get the following vaccines if they missed doses when they were younger:

- Hepatitis A (HepA) vaccine
- Hepatitis B (HepB) vaccine
- Polio (IPV) vaccine
- Measles, mumps, and rubella (MMR) vaccine
- Chickenpox (varicella) vaccine

If a teen has any chronic medical conditions, they may need additional vaccines. A doctor or health care provider can determine what they need.

Families should keep an online or printed record of their child’s vaccinations for future reference. Schools, camps, colleges, the military, and employers may require proof of their immunization status. Families can also set up an immunization records account at MyIRMobile.com. This site tracks a child’s immunizations and can print a Certificate of Immunization Status form for school or child care in Washington state.

We recommend reading these additional resources:

- 2023 Recommended Immunizations Schedule for Children 7–18 Years Old | CDC
- Immunization For Preteens and Teens (7-18 Years) | DOH
- Which Vaccines Do Preteens & Teens Need? | Vaccinate Your Family

Chapter 11: Adults Need Vaccines Too

Vaccine-preventable diseases affect people of all ages. While most recommended vaccination happens during childhood, there are a variety of important vaccines for adults too. Some diseases are more common in adults and may cause life-threatening health problems. In addition, certain diseases can be more severe for adults than for children. Each year, about 50,000 adults die from diseases that could have been prevented by vaccines in the United States. Adults can protect themselves, their loved ones, and others in the community by staying up to date on vaccinations.

The best way to learn if you need adult vaccinations is by talking to your doctor or health provider. In this chapter, we'll highlight different types of vaccines for adults and why you might need them.

Vaccines for All Adults

There are multiple vaccines adults can get at any point if they have not had them previously. This includes the following vaccines:

- **COVID-19 Vaccine** – Adults should get COVID-19 vaccine and recommended booster doses to protect against serious complications from COVID-19 disease, including hospitalization and death. Those who have been vaccinated against COVID-19 are less likely to develop heart issues from COVID infection. In addition, those who were vaccinated before getting COVID-19 were less likely to have symptoms of long COVID, a series of symptoms that occur for weeks or months after COVID-19 illness.

- **Flu Vaccine** – All adults should get a flu vaccine every year to protect against influenza (flu). We need yearly flu vaccines because flu viruses change every season. Likewise, flu vaccines are updated every year to protect against the most common strains of flu. As of 2024, common flu vaccines protect against 4 major strains of flu viruses.

  Flu vaccines can help prevent people from catching the flu. For vaccinated people who still get the flu, the vaccine will reduce severe symptoms and hospitalization. Older adults are more likely to have severe symptoms or die from flu each year, which is why vaccination is so important.

  For some people, the flu vaccine may cause mild side effects, such as headache, fever, fatigue, and arm soreness. These side effects are from your body developing immunity. People cannot get the flu from flu vaccines.

- **Hepatitis A Vaccine** – Adults should get hepatitis A vaccine if they didn't receive the series as a child. Hepatitis A infects the liver and causes fatigue, nausea, pain, and jaundice for up to two months. It is spread when someone unknowningly ingests the virus, which is why it is commonly mentioned when exposure happens at restaurants.
  Certain jobs may recommend hepatitis A vaccine if you may be exposed to blood or bodily fluids during work.

- **Hepatitis B Vaccine** – Adults should get hepatitis B vaccine if they didn't receive the series as a child. Hepatitis B infects the liver and may or may not cause symptoms. If they appear, symptoms include fatigue, poor appetite, stomach pain, nausea, and jaundice. Most cases of hepatitis B are short term, but some people may develop a chronic infection that can cause life-threatening issues. Hepatitis B spreads when infected blood or bodily fluids enter a person's body.

  Certain jobs may recommend hepatitis B vaccine if you may be exposed to blood or bodily fluids during work.

- **MMR (Measles-Mumps-Rubella) Vaccine** – Adults born after 1957 need at least 1 dose of MMR vaccine unless they have laboratory confirmation of measles immunity. Two doses of MMR vaccine are recommended for adults at higher risk, including healthcare workers, international travelers, and students attending college. MMR vaccine protects against measles, mumps, and rubella, all contagious diseases which still occur in the United States.

  In Washington state, people working or volunteering for a licensed child care must show measles vaccination or laboratory confirmation of measles immunity. See Revised Code of Washington 43.216.690.

- **Polio Vaccine** - All adults should get the inactivated polio virus (IPV) vaccine if they never vaccinated against polio, or never received the full polio vaccine series. The polio virus can cause paralysis and death. There is no treatment for polio disease. Although rare, poliovirus outbreaks can still occur when infected travelers visit other countries. Talk to your doctor or healthcare provider if this situation applies to you.

- **RSV Vaccine** - The respiratory syncytial virus (RSV) vaccine is recommended for pregnant people who are 32 to 36 weeks pregnant during September through January. The vaccinated person passes antibodies to their newborn child, which provides short-term protection against severe RSV illness.

- **Tdap Vaccine/Td Vaccine** – All adults should get Tdap vaccine to protect against tetanus, diphtheria, and pertussis if they were not vaccinated as children. Every 10 years, people should receive a Td or Tdap booster vaccine as immunity to these specific diseases decreases over time.

  As an adult, getting vaccinated against pertussis (whooping cough) protects babies and young children from catching the disease. Because whooping cough is spread very easily among people, family and community vaccination is very important to prevent children from getting very sick or dying.

  Pregnant people should get a Tdap vaccine during the third trimester of pregnancy. This provides their newborn short-term protection against whooping cough before the baby can get vaccinated at 2 months of age.

Vaccines for Adults Ages 50 and Older

As we get older, our immune systems weaken. This makes older adults more at risk for certain diseases. In addition to flu, Tdap, and COVID-19 vaccines, adults 50 years and older may need the following vaccines.

- **Pneumococcal Vaccine** – Adults 50 and older should get the pneumococcal vaccine, which protects against pneumonia and other pneumococcal disease. Certain adults younger than 50 years of age who are at increased risk may also need this vaccine. Pneumonia is an infection of the lungs which causes mild to severe illness. Some adults are more at risk of pneumonia, such as those with diabetes,

heart disease, or a history of smoking.

- **RSV (Respiratory Syncytial Virus) Vaccine** – Adults 60 years or older can get RSV vaccine if they are more at risk for this illness. RSV is an incredibly common virus that causes lung infections. RSV usually causes cold-like symptoms, but may be more serious in certain people. Adults should discuss with their provider to see if vaccination is right for them.

- **Shingles Vaccine** – Adults 50 years of age and older should get the shingles vaccine series to protect against shingles outbreaks. Shingles causes a painful rash of blister-like sores on one side of the body, fever, headache, chills, and upset stomach. It can be especially dangerous if it occurs over your face. It is the same virus that causes chickenpox.

  Children who receive the chickenpox vaccine are less likely to get shingles as they got older.

  If you've had shingles before, you can still get vaccinated with shingles vaccine. The vaccine is very likely to prevent further outbreaks.

We recommend looking at additional resources for adult vaccination listed below.

- Vaccines Recommended for Adults | Centers for Disease Control and Prevention
- Immunizations For Adults | Washington State Department of Health
- Vaccines For Adults | Health and Human Services
- Why Are Vaccines Important for Adults? | Vaccinate Your Family

QUESTION: Where can I get vaccinated?

ANSWER: People can get vaccinated by their local health care provider. Many pharmacies also give vaccinations to adults and children of certain ages.

In Washington state, providers enrolled in the Childhood Vaccine Program provide vaccine at no cost for all children seen at the practice. Providers in the Adult Vaccine Program gives vaccines to adults 19 years of age and older who are uninsured. The state's immunization provider map shows which providers receive vaccines through these programs.

Most health plans cover recommended immunizations for adults. For more details, people should check with their insurance plan, doctor, or nurse. Find low-cost immunization clinics by calling the Family Health Hotline at 1-800-322-2588 or by visiting the Parent Health Resource Finder web page.

Chapter 12: Evaluating Immunization Info on the Internet

The Internet can be a valuable resource to find health information. However, it is important to remember that anyone can put up a website on a topic without the credentials or ability to interpret information correctly. Often, it is difficult to evaluate if a website is sharing facts, opinions, myths, or common misunderstandings. Medical information changes rapidly, so it is a good idea to check more than one place to verify specific details and make sure websites have updated their information.

Here are a couple of web pages with more information on how to tell whether a source of vaccine information can be trusted:

- Finding Credible Vaccine Information | CDC
- Vaccine Basics - Evaluating Health Information on the Internet | vaccineinformation.org

The following tips can help you determine if the information you find on a website is accurate and trustworthy.

1. **The ownership of the site should be clear.**
   Look for text that tells you more about the author, organization, or individual. On some sites, the name of the site's owner can be found by right-clicking and selecting "View page info" (Chrome and Firefox) or "Properties" (Internet Explorer).

   Certain internet domains are more trusted than others. Government sites (.gov), non-profit or organization sites (.org), and educational sites (.edu) have more trusted and verified information than other domains. However, all sites should be taken with some level of criticism, given the growing ease of access people have to use new internet domains.

2. **The information provided should be based on valid scientific studies.**
   Scientists discover truth by testing their findings in multiple ways. Studies with hundreds of participants are more trustworthy than descriptions of what happened to a single person. The most useful studies compare a treatment group with a control group. The control group is given no treatment or a placebo, which allows scientists to compare differences between the two groups. This allows scientists to measure changes more effectively. Sound scientific studies are often endorsed by organizations or institutions dedicated to science, such as professional associations or universities.

3. **The site should carefully weigh the evidence and share limitations of the work.**
   Be wary of people or sites proclaiming that they, and only they, have discovered the "hidden truth." Credible researchers are not afraid to address the weaknesses as well as the strengths of their findings. In fact, other scientists expect them to share their thoughts on the weaknesses of the study. Scientists will use this information to develop new studies to further develop or disprove an idea.

   Having more research studies on a specific topic helps to point the scientific community to the correct answer. One study that says vaccines work is not as strong as 30 studies that say vaccines work and 2 that don't. A scientifically sound website will contrast and compare different types of research.

4. **The people providing the information should be qualified to address the subject matter.**
   A researcher who has done good work would insist that his or her name be attached to information or a study, even if it's controversial. Ask yourself: Who stands behind the information? What educational or work background do they have that relates to the health topic area? What other work have they published, and where was it published?

5. **The motives of the site should be clear.**
   Determine the purpose of the website and the motive behind it. Commonly trusted medical sites will write in a factual way without providing opinions or judgments. These sites are used to inform the public or other health care professionals. Some sites may provide information with the goal of selling a product. For example, a site owner might sell a book or health products. Sites with a commercial purpose are less trustworthy because they're encouraged to write in a certain way to make money.

6. **The information should make sense.**
   If information sounds too good to be true, like products that say "Lose 50 pounds in two days!" it most likely isn't true. If the news is too unbelievable to be true, like "Thousands abducted by UFOs!" then it probably isn't true. When unsure, people should use multiple sources of information to confirm or deny these claims.

7. **You should be able to get additional information if you need it.**
   Trustworthy publishers will share the sources of information they used to write about a topic. Sharing sources gives the content more credibility. This also allows you to check the information from the original source.

   You should be able to verify the author of the content you read. Check to see if they have professional and contact information showing they're qualified to write on the specific subject. In some cases, content may be written by artificial intelligence and use a fake author name. Verifying the writer and their history is important to make sure you're reading accurate and truthful information.

   Be wary of content requiring money to read. Although newspapers and research networks may request a subscription for access to content, other people or businesses can use this to scam you into giving them money for misleading commercial products.

QUESTION: Is there any regulation or standardization of information on the Internet?
ANSWER: No. There is no regulation of information on the Internet. The following resources can provide some additional guidelines to consider when looking at health information on the Internet:

Trust or Trash
This nonprofit website offers simple guidelines to help you decide to "trust or trash" health information online.

The World Health Organization (WHO)
The WHO's Check the Source web page has established guidelines for websites providing information about vaccine safety. It features a list of criteria that websites should meet to be trustworthy.

Healthfinder
Healthfinder.gov is the federal government's gateway for reliable information from U.S. government agencies and other organizations. It displays selected resources of consumer health and human services information which have been reviewed and found reliable and credible. Visit www.healthfinder.gov.

FactCheck.org
FactCheck.org is a nonprofit website used to check the factual nature of scientific, political, or other claims.

Michelle's Story

Michelle Razore | Bellevue, Washington
Daughter Natalie born in 2010 – Survivor

Meet Michelle and watch her video as she tells of how her daughter, Natalie, nearly died from whooping cough (pertussis) just weeks after being born. Natalie was on life support, suffered serious complications, and was in the hospital for 72 days. Despite the odds Natalie survived! Michelle is now a strong advocate for Tdap vaccination during pregnancy and getting the adult booster vaccine in order to prevent the spread of whooping cough to babies.

Scarlet's Story

Scarlet Anne Taylor | Tacoma, Washington

Rebecca Hendricks lost her daughter to the flu on December 19, 2014. Five-year-old Scarlet Taylor was gone in less than 48 hours after her first flu symptom. Scarlet was sent home from school with a fever on a Wednesday. Tylenol helped to lower Scarlet's fever and the following day she ran errands with her mom. On Friday morning, Rebecca took her daughter to the hospital because of her raspy breathing. Less than four hours after walking into the hospital, Scarlet was gone.

Weeks later, doctors told Rebecca that Scarlet's cause of death was the H3N2 flu. Rebecca didn't know that the flu killed people. Scarlet was never vaccinated for flu. Rebecca is now a strong advocate for flu vaccination. She says that even if the flu shot was only 10 percent effective that it might've helped. "I'd take 10 percent if it meant that much of a difference [between life and death]. Her symptoms could've been less, her little body could've handled it better if she had gotten that vaccine."

After her daughter's tragic death, Rebecca dedicated her life to raising awareness about the flu and the vaccine that can prevent it. She created a nonprofit called The End-Fluenza Project. She wants to make sure no other family will have to live through what she did. The End-Fluenza Project's mission is to increase vaccination rates among children by empowering families with the knowledge to make informed decisions about vaccination, preventative lifestyle changes, as well as keeping those lives lost by flu, alive through their awareness campaigns.

"Momma, when I grow up I want to be a singer and a dancer." – Scarlet Anne Taylor, 5 years old
Source: The End-FLUenza Project, Scarlet Taylor

Stand Together to Protect Us All: Jaxon's Story

by Paula Abalahin, Port Orchard

My son Jaxon got measles when he was 7 months old, too young to get immunized. He got better, but five years later he started having seizures. He lost the ability to swallow, speak, and walk. After suffering greatly, Jaxon died a few years later. His condition [SSPE] was caused by the measles virus.

We learned that, even though there is an effective vaccine, measles is still a leading cause of death among young children worldwide. And in our community, parents are not fully immunizing their children, which puts them at risk to get and spread measles and other terrible diseases. I hope my story can help prevent another child from experiencing what my son went through.

Fear of Needles: A Very Real Thing

by Wendy Sue Swanson, MD, MBE, FAAP*

Vaccine hesitancy comes in all flavors. It's not always concerns about safety that cause children, teens, and parents to hesitate or even refuse vaccines (shots, in particular). Sometimes it's about pain. Or simply discomfort. Or anxiety. It's perfectly natural, of course, to have a fear of needles. Sometimes this fear can manifest itself as a sincere phobia. In those cases, the fear is so overwhelming that it changes family decision-making around vaccinations and leaves kids unprotected.

I took care of a high school student soon after she'd had a terrible experience with the flu and it's changed how I care for my patients. She had asthma and her doctor had recommended a flu shot. Even though doctors recommend flu shots for all kids between 6 months of age and 18 years, we work very hard to get high-risk patients protected. Children and teens with asthma are more likely to have a severe pneumonia with, or after getting, the flu. We worry more about their infections because it can land them in the hospital and cause life-threatening illness.

When I saw the girl in clinic she was exhausted and stressed, confused and scared. Because of the flu, she had missed 2 weeks of school and lost over 15 pounds. She was still coughing a few weeks later. I looked back to the chart note visit before her infection and saw that she had declined the shot. When I asked her why, she stated that she was terrified of needles. Because of her asthma, she couldn't get the nasal FluMist (wheezing is a contraindication) so the shot was her only option. Had you told the doctor your reason for staying NO? "Yup," she said. But no plan of action was made to support her. So here's the thing, we know that fear and anxiety about injections worsens when a parent is scared, too. When I asked her mom if she was scared, she nodded. But after the experience of the illness, both were very motivated to figure out how to get the shot next year.

Chapter 14: Glossary

VACCINE TERMS

COVID-19: Corona Virus Disease 2019
DTaP: Diphtheria, tetanus, and acellular pertussis (whooping cough)
Flu: Influenza
HepA: Hepatitis A
HepB: Hepatitis B
Hib: *Haemophilus influenzae* type b
HPV: Human papillomavirus
IIV: Inactivated influenza vaccine
IPV: Inactivated polio vaccine
LAIV: Live, attenuated influenza vaccine
MMR: Measles, mumps, and rubella
MenABCWY Meningococcal conjugate and recombinant vaccine for serotypes A, B, C, W, and Y
MenACWY Meningococcal conjugate vaccine for serotypes A, C, W, and Y
MenB Meningococcal recombinant vaccine for serotype B
OPV: Oral polio vaccine
PCV: Pneumococcal conjugate vaccine
PPSV: Pneumococcal polysaccharide vaccine
RSV: Respiratory Syncytial Virus
RV: Rotavirus
Td: Tetanus, diphtheria
Tdap: Tetanus, diphtheria, and acellular pertussis
Var: Varicella (chickenpox)

OTHER HEALTH TERMS

COE: Certificate of Exemption
CIS: Certificate of Immunization Status
CRS: Congenital Rubella Syndrome
GBS: Guillain-Barré Syndrome
MS: Multiple Sclerosis
SIDS: Sudden Infant Death Syndrome
VAERS: Vaccine Adverse Event Reporting System
VAPP: Vaccine Associated Paralytic Polio
VIS: Vaccine Information Statement
VSD: Vaccine Safety Datalink Project

ORGANIZATIONS

AAFP: American Academy of Family Physicians
AAP: American Academy of Pediatrics
ACIP: Advisory Committee on Immunization Practices
CDC: Centers for Disease Control and Prevention
FDA: Food and Drug Administration
FTC: Federal Trade Commission
IOM: Institute of Medicine
VICP: National Vaccine Injury Compensation Program
WHO: World Health Organization

Chapter 15: Resources

LOCAL RESOURCES

Immunization
Office of Immunization
Washington State Department of Health
360-236-3595 or 1-866-397-0337

Watch Me Grow Washington
Washington state's health promotion system mails information to parents of children birth to six years old.
Washington State Department of Health

Washington State Immunization Information System for Providers
Washington state's lifetime immunization registry
Washington State Department of Health

My Immunization Records
View family immunization records and due dates at home or on mobile.

Washington State Local Health Jurisdictions
Washington State Department of Health

WithinReach
Help Me Grow Washington Hotline 1-800-322-2588 (services available in many languages)

Help Me Grow Washington
A website helping families connect with health resources in Washington state.

Immunity Community of Washington
Tools for parents and others who want to share that vaccination is a safe and healthy choice for their community.

Boost Oregon
Portland based organization that empowers people to make science-based vaccine decisions for themselves, their families, and the community.

NATIONAL RESOURCES

Vaccine Recommendations and Guidelines of the ACIP
Advisory Committee on Immunization Practices
Centers for Disease Control and Prevention

Immunizations
American Academy of Pediatrics

Vaccine Education Center
Children's Hospital of Philadelphia

Vaccines
Vaccine safety and regulations
Food and Drug Administration

Immunize.org
Vaccination Information for Healthcare Professionals

Institute for Vaccine Safety
Johns Hopkins Bloomberg School of Public Health

Vaccines and Immunizations
National Immunization Program
U.S. Centers for Disease Control and Prevention
Hotlines, English and Spanish:
1-800-232-4636, TTY: 1-888-232-6348

Vaccines.gov
U.S. Department of Health and Human Services

Do you have a child between the ages of 0 to 6 years?

Sign up for the Watch Me Grow Washington mailings!

These mailings remind you of upcoming well child visits and provide helpful health and safety information for your child.

Scan here to sign up!

Washington State Department of HEALTH