Diseases for which vaccination is routinely recommended

- Diphtheria
- Haemophilus influenzae type b (Hib)
- Hepatitis A
- Hepatitis B
- Herpes zoster (shingles)
- Human papillomavirus (HPV)
- Influenza
- Measles
- Meningococcal disease
- Mumps
- Pertussis
- Pneumococcal disease
- Polio
- Rotavirus
- Rubella
- Tetanus
- Varicella (chickenpox)

Diphtheria

- This photo shows the throat of a child with diphtheria. There is a thick gray coating over the back of the throat.
- If not treated, this child could die from suffocation.

Haemophilus influenzae type b (Hib)

- This girl is hospitalized with Hib infection, shown here involving the deep tissue of her face.
- Hib disease can also lead to brain damage, seizures, paralysis, hearing loss, and death.

Hepatitis A

- Hepatitis A virus infection has caused this man’s skin and the whites of his eyes to turn yellow (jaundice). This yellow coloration is the result of excess bilirubin, which builds up as a result of bile duct obstruction.
- Other symptoms of hepatitis A can include:
  - loss of appetite
  - abdominal pain
  - nausea or vomiting
  - fever
  - headaches
  - pale, clay-colored stool
  - dark urine
Hepatitis B

- This woman died from liver cancer four months after arriving at a refugee resettlement camp. The liver cancer was caused by chronic infection with hepatitis B virus.
- The likelihood of carrying the virus for life (chronic infection) depends on a person’s age when infected:
  - 2 of 100 adults
  - 30 of 100 children age 3-5 years
  - 90 of 100 infants
- About 1 out of 4 persons who become chronically infected during childhood die prematurely from cirrhosis (scarring) of the liver or liver cancer.

Herpes zoster (shingles)

- Shingles infection of the eye can lead to a loss of vision.
- Without vaccination, about 1 in 3 people who have been infected with chickenpox will later develop shingles.

Human Papillomavirus (HPV)

- HPV is the most common sexually transmitted infection in the U.S. Approximately 79 million Americans are infected.
- Most sexually active men and women will get at least 1 type of HPV at some point in their lives.
- Persistent infection with high-risk types of HPV is associated with almost all cervical cancers.
- An estimated 44,000 HPV-associated cancers occur annually in the U.S.

Human Papillomavirus (HPV)

- Human photos of persons with HPV usually include genitalia and are quite graphic, so we have chosen not to include them here.
- To view some of these photos:
  - Go to the Public Health Image Library [http://phil.cdc.gov] and type HPV in the search box.
  - You also can use the Google image search feature.

Influenza

- This photo shows how the influenza virus can spread through the air when someone coughs.

Influenza

- The 1918 influenza pandemic killed at least 50 million people worldwide.
Influenza

• The burden of influenza disease in the United States can vary widely and depends upon a number of factors, including the characteristics of circulating viruses, the timing of the season, how well the vaccine is working to protect against illness, and how many people got vaccinated.
• While the impact of influenza varies, it places a substantial burden on the health of people in the U.S. each year.

Measles

• This child has a severe measles rash, as well as red eyes, a runny nose, and a fever.
• Measles can cause pneumonia, seizures, brain damage, and even death.
• Death from measles occurs in 2–3 per 1,000 reported cases in the U.S.

Measles

• Young boy with characteristic measles rash

Meningococcal Disease

• Meningococcal disease is a sudden, life-threatening illness caused by bacteria that infect the blood (septicemia) or the brain and spinal cord (a type of meningitis).
• Meningococcal disease can cause shock, coma, and death within hours of the first symptom. Even with proper treatment, 10–15% of people with meningococcal disease die.
• Of people who survive, as many as 20% suffer from some serious complication such as loss of an arm or leg, brain damage, or permanent hearing loss.
Mumps

- This child’s jaw and cheek are swollen from mumps.
- Mumps often leads to painful swelling of the salivary glands.
- Mumps can lead to painful swelling of the testicles in males, deafness, and brain damage.

Mumps

- A young child with characteristic swelling of the front of the neck due to enlargement of the submaxillary salivary glands brought on by a mumps infection.

Pertussis (whooping cough)

- This child has pertussis, a highly contagious respiratory disease caused by the bacterium Bordetella pertussis.
- Pertussis is known for uncontrollable, violent coughing which often makes it hard to breathe. After coughing fits, someone with pertussis often needs to take deep breaths, which result in a “whooping” sound.
- Pertussis can affect people of all ages, but can be very serious, even deadly, for babies less than a year old.

Pertussis (whooping cough)

- This child has broken blood vessels in his eyes and bruising on his face as a result of coughing from pertussis.

Pneumococcal Disease

- This is a photo of the brain of a person who died from pneumococcal meningitis. Note the purulence (pus) that covers the brain surface.
- Pneumococcal disease is caused by bacteria that can lead to serious infections in the lungs (pneumonia), blood (sepsis), or brain (meningitis).

Polio

- This photo of a Los Angeles hospital respiratory ward in 1952 shows polio patients in iron lungs – machines that were necessary to help them breathe.
Polio

- This child has a severely deformed leg caused by polio.
- Although polio has been eliminated from most of the world, until poliovirus transmission is interrupted in every county, all countries remain at risk of importation of polio.

Rotavirus

- Doctor examining child dehydrated from rotavirus infection.
- In developing countries, rotavirus causes about half a million deaths each year in children younger than 5 years of age.
- Almost all unvaccinated children get infected with rotavirus before reaching age 5.

Rubella

- This teen has a rash from rubella.
- The rash is not as prominent as the measles rash and is often missed in diagnosis.
- Rubella in pregnant women can lead to miscarriage, as well as severe medical problems in their newborns.

Rubella

- This infant was born with rubella.
- Babies whose mothers were infected with rubella during pregnancy can be born with deafness, blindness, heart damage, and intellectual disability.

Tetanus

- This baby has neonatal tetanus. His body is rigid.
- Most newborns who get tetanus die.
- Infection can occur if a mother is unimmunized against tetanus and the baby’s newly-cut umbilical cord is exposed to dirt.
- Neonatal tetanus can be prevented by hygienic delivery practices and/or immunizing mothers against tetanus.

Tetanus

- This person has tetanus. The muscles in his body are in spasm, making it nearly impossible for him to move.
- Tetanus bacilli live in the soil, and many types of injuries can allow the bacteria to enter the body.
Varicella (Chickenpox)

- This photo shows the typical itchy chickenpox rash. There can be 500 or more sores.
- Many cases of chickenpox are mild, but deaths from this disease can occur.
- Before vaccine became available, about 100 previously healthy people died from chickenpox every year in the U.S.

Other diseases for which vaccines are used in special situations

- Adenovirus
- Anthrax
- Cholera
- Japanese encephalitis
- Rabies
- Smallpox
- Typhoid fever
- Yellow fever

Adenovirus

- Adenoviruses are common causes of respiratory illness, but most infections are not severe.
- They can cause:
  - Cold-like symptoms
  - Sore throat
  - Bronchitis
  - Pneumonia
  - Diarrhea
  - Pink eye (conjunctivitis)
- A vaccine against adenovirus types 4 and 7 is approved by FDA for U.S. military personnel only.

Anthrax

- Anthrax is a serious disease caused by Bacillus anthracis, a bacterium that forms spores. Three types of anthrax exist:
  - Skin (cutaneous) (This is the type shown in the photo.)
  - Lungs (inhalation)
  - Digestive (gastrointestinal)
- Humans can become infected with anthrax by handling products from infected animals, breathing in anthrax spores, or eating infected meat.

Cholera

- Cholera is an acute diarrheal illness caused by infection of the intestine with the bacterium Vibrio cholerae.
- An estimated 3–5 million cases and over 100,000 deaths occur each year around the world.
- This infection is often mild or without symptoms, but it can cause life-threatening dehydration.
- In 2015, FDA approved the first cholera vaccine available in the U.S. The vaccine was approved for use in adults age 18 through 64 years traveling to areas where cholera is occurring.
Japanese Encephalitis

- The Japanese Encephalitis virus is transmitted by the bites of infected mosquitoes. This is an image of a Culex mosquito laying eggs.
- Japanese encephalitis is the most common vaccine-preventable cause of encephalitis (inflammation of the brain) in Asia.
- Most infections are mild (e.g., fever and headache) without apparent symptoms. However, about 1 in 200 infections results in severe disease characterized by rapid onset of high fever, headache, neck stiffness, disorientation, coma, seizures, spastic paralysis, and death.
- A vaccine is available to prevent Japanese encephalitis.

Rabies

- This dog was suspected of being rabid. It exhibited signs of restlessness and overall uncharacteristic aggressive behavior, which are two symptoms of rabies.
- Other symptoms of rabies in pets may include impaired walking, eating, and drinking.

Smallpox (Variola)

- This man’s body is covered with lesions from smallpox.
- A worldwide smallpox vaccination program led to the eradication of smallpox in 1979. The smallpox virus no longer exists in nature.
- The eradication of smallpox ranks as one of the greatest achievements in the history of medicine.

Typhoid Fever

- This serious disease is caused by the bacteria Salmonella typhi. It is transmitted through the ingestion of food or drink which has been contaminated by the feces of an infected person.
- Typhoid can cause a high fever, weakness, headache, loss of appetite, stomach pains, and a rash of flat, rose-colored spots.
- If the disease is not treated, it can kill up to 20% of people who get infected. It can be treated with antibiotics, but antibiotic-resistant strains are a growing problem.
- Typhoid fever is still common in low-income countries. Vaccines are available to prevent typhoid fever.

Yellow Fever

- This female Aedes aegypti mosquito can transmit the viruses that cause Dengue fever, Zika, and yellow fever. These viruses are transferred to the host when bitten by a female mosquito.
- The word “yellow” in the name refers to the jaundice that affects some patients. The virus is endemic in tropical areas of Africa and Latin America.
- There is an effective yellow fever vaccine, but there is no cure for the disease. Most infected patients improve after 3 to 4 days. However, 15% of patients enter a second, more toxic phase of the disease, about half of whom die within 10–14 days.
Useful handouts on vaccine-preventable diseases (VPDs) for parents and patients

- Detailed Q&A handouts on all routine VPDs and the vaccines that prevent them
  www.immunize.org/handouts/vaccine-questions.asp
- Easy-to-read Q&As/summaries of routine VPDs and the vaccines that prevent them
  www.immunize.org/handouts/vaccine-summaries.asp
- Immunization schedules for patients and parents
  www.immunize.org/handouts/vaccine-schedules.asp

For more information on any of these diseases and the vaccines that can prevent them, go to:

- www.immunize.org
- www.vaccineinformation.org