

What is Measles?

Measles is caused by a single-stranded, enveloped RNA virus. It is a member of the genus *Morbillivirus* in the *Paramyxoviridae* family. Humans are the only known natural hosts.

Most measles cases in the United States have been among people who are not vaccinated against measles. Measles cases occur as a result of importations by people who were infected while in other countries and from subsequent transmission that may occur from those importations. Measles is more likely to spread and cause outbreaks in communities where groups of people are unvaccinated.

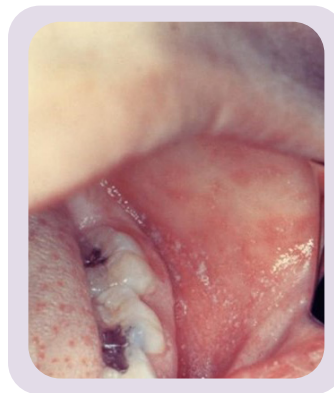
Current Measles Outbreaks

The CDC tracks all measles outbreaks on [their website](#).

What are the symptoms of Measles?

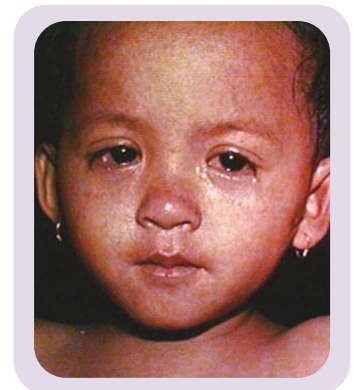
Measles symptoms appear 7 to 21 days after exposure to the virus and typically include high fever, cough, runny nose, and puffy, irritated eye lids.

Tiny white spots (Koplik spots) may appear inside the mouth two to three days after symptoms begin.



←
Example of
[Koplik spots](#)

Example of →
[conjunctivitis](#)



Three to five days after symptoms begin, a rash breaks out. It usually begins as flat red spots that appear at the hairline and spread downward and outward to the neck, trunk, arms, legs, and feet.

- Small, raised bumps may also appear on top of the flat red spots.
- The spots may become joined together as they spread from the head to the rest of the body.
- When the rash appears, a person's fever may spike to more than 104°F.

The rash can be subtle in patients with darker skin tones.

Who is at high-risk for Measles?

People at high risk for severe illness and complications from measles include:

- Infants and children aged <5 years
- Adults aged >20 years
- Pregnant people
- People with compromised immune systems, such as from leukemia and HIV infection

Complications from Measles

Common complications from measles include otitis media, bronchopneumonia, laryngotracheobronchitis, and diarrhea.

Even in previously healthy children, measles can cause serious illness requiring hospitalization.



↑
Examples of **rashes**

- One out of every 1,000 measles cases will develop acute encephalitis, which often results in permanent brain damage.
- One to three out of every 1,000 children who become infected with measles will die from respiratory and neurologic complications.
- [Subacute sclerosing panencephalitis \(SSPE\)](#) is a rare, but usually fatal degenerative disease of the central nervous system characterized by behavioral and intellectual deterioration and seizures that generally develop 7 to 10 years after measles infection.

How does Measles spread?

Humans are the only reservoir and measles is spread person-to-person via large droplets or airborne through aerosolized droplet nuclei in closed areas (e.g., an exam room). Measles is one of the most contagious of all infectious diseases; **up to 9 out of 10 susceptible persons with close contact to a measles patient will develop measles.** Infected people can spread measles to others from four days before through four days after the rash appears.

Measles virus can survive for up to two hours in an airspace after an infected person leaves an area.

What testing is available for Measles?

Laboratory confirmation is essential and allows for tracking of cases. Detection is through measles-specific IgM antibody in serum and measles RNA by real-time polymerase chain reaction (RT-PCR) through a throat or nasopharyngeal swab from patients suspected to have measles. Report suspected measles cases to your local or state health department and discuss available diagnostic testing.

Health care professionals should consider measles in patients presenting with febrile rash illness and clinically compatible measles symptoms, especially if the person recently traveled internationally or was exposed to a person with febrile rash illness.

What is available to prevent Measles?

Measles can be prevented with measles-containing vaccine, which is primarily administered as the combination measles-mumps-rubella (MMR) vaccine. The combination measles-mumps-rubella-varicella (MMRV) vaccine can be used for children aged 12 months through 12 years for protection against measles, mumps, rubella and varicella. Single-antigen measles vaccine is not available.

One dose of MMR vaccine is approximately 93% effective at preventing measles; two doses are approximately 97% effective. Almost everyone who does not respond to the measles component of the first dose of MMR vaccine at age 12 months or older will respond to the second dose. Therefore, the second dose of MMR is administered to address primary vaccine failure.

Who is eligible for a Measles vaccine?

CDC recommends routine childhood immunization for MMR vaccine starting with the first dose at 12 through 15 months of age, and the second dose at 4 through 6 years of age or at least 28 days following the first dose. The measles-mumps-rubella-varicella (MMRV) vaccine is also available to children 12 months through 12 years of age; the minimum interval between doses is three months.

Students at post-high school educational institutions without evidence of measles immunity need two doses of MMR vaccine, with the second dose administered no earlier than 28 days after the first dose.

All U.S. residents older than age 6 months without evidence of immunity who are planning to travel internationally should receive MMR vaccine prior to departure. Infants aged 6 through 11 months should receive one dose of MMR vaccine before departure.

Infants who receive a dose of MMR vaccine before their first birthday should receive two more doses of MMR vaccine, the first of which should be administered when the child is age 12 through 15 months and the second at least 28 days later.

People who were born before 1957 are presumed to have immunity from prior exposure.

Is there post-exposure prophylaxis (PEP) for Measles?

People exposed to measles who cannot readily show that they have evidence of immunity against measles should be offered post-exposure prophylaxis (PEP). To potentially provide protection or modify the clinical course of disease among susceptible persons, either administer MMR vaccine within 72 hours of initial measles exposure, **or** immunoglobulin (IG) within six days of exposure. State and local public health departments can be helpful in cases where PEP is indicated.

Do **not** administer MMR vaccine and IG simultaneously, as this practice invalidates the vaccine.

Please refer to the following references for additional information on post-exposure prophylaxis:

- [Prevention of Measles, Rubella, Congenital Rubella Syndrome, and Mumps, 2013:](#)

[Summary Recommendations of the Advisory Committee on Immunization Practices \(ACIP\).](#)

- [General Recommendations on Immunization: Recommendations of the Advisory Committee on Immunization Practices \(ACIP\).](#)

What infection prevention and control for Measles is necessary in health care settings?

Patients with signs or symptoms of measles should be identified as soon as possible. Provide a facemask and separate them from other patients in the health care facility, preferably using a negative pressure room. Transport of the patient should be limited; if transport is necessary, the patient should wear a facemask and the route should limit exposure to others. Only those necessary to patient care and well-being should be allowed in the room. Rooms where suspected or confirmed measles patients have been should remain vacant for up to 2 hours to allow for airborne contaminant removal.

Nonimmune health care professionals should not care for patients with measles. Immune health care professionals should still abide by Airborne Precautions and wear a respirator (e.g., fit-tested N95) due to the risk, albeit very low, of vaccine failure.

Standard cleaning and disinfecting procedures provide adequate environmental control in health care settings.