

## Measles (Rubeola)

Measles is a highly contagious viral disease with an abrupt onset. Measles commonly causes fever, rash, cough, and runny nose. [Measles may cause serious complications and result in pneumonia, swelling of the brain, convulsions, deafness, long-term intellectual disabilities, and death in 1-2 out of 1000 infections.](#) Measles is also known as rubeola, which should not be confused with [rubella](#), another vaccine-preventable viral rash illness that is uncommon in developed countries, or [roseola](#), a common, mild rash illness that occurs in children.

## Transmission

Measles is spread **person-to-person** when an infected person coughs or sneezes. This virus is extremely contagious because particles are very small and stay in the air for up to two hours after a contagious person has been in an area. Because it is airborne, it can spread between rooms of a building via the air duct system. When a person with no immunity through immunization or prior infection is exposed to measles virus, the probability of contracting disease is very high – over 90% for a single encounter. A single person with measles spreads disease to an average of 18 other people if those people are not immune due to immunization or prior infection.

## Symptoms

Symptoms typically appear within 7-12 days of exposure but may appear up to 21 days after exposure. Symptoms almost always first include a fever, followed by [a characteristic flat, blotchy rash](#) that starts on the face and neck and progresses down the body. Most people with measles will also develop flu-like symptoms, including a cough, runny nose, and pink or watery eyes. People with measles may also develop tiny white spots inside their mouth called “Koplik spots.”

## Diagnosis

**Suspected measles cases should be reported to the ND HHS immediately.** Measles diagnosis requires an oral PCR swab test and may also include a blood sample for IgM. Tests can be routed to [ND HHS Laboratory Services](#) for testing. For questions and recommendations about testing, please contact the [ND HHS Immunization Unit](#). Providers should consider recent travel and vaccination status, when assessing the [likelihood of measles and need to test](#).

### *Special Considerations for Measles Work-Up in Patients*

Measles is extremely contagious and dangerous to infants under one year old, who have not had an opportunity to be vaccinated, or patients who are immunocompromised. If a patient or family suspects measles, they should call ahead before presenting to a clinic or hospital. Health care providers may wish to meet a patient outside and perform drive-up assessment and testing. Suspect measles patients should not enter or occupy the waiting area of a health care facility if this can be avoided. If measles is suspected, the patient and all exposed to them should be given a mask immediately and isolated in a room with negative pressure if possible. Rooms with suspect measles cases should be sanitized and closed to patients for a minimum of two hours following the suspect measles case.

## Treatment

There is no specific antiviral treatment for measles. Antibiotics may be used in cases that have developed secondary bacterial infections. Supportive care can be offered to measles patients, and resources often demand that families care for measles patients at their home. In some cases, measles cases will require hospitalization. Approximately 1 in 5 individuals diagnosed with measles will be hospitalized.

## Prevention

- Measles is easily prevented through vaccination. Measles vaccine is extremely safe, and after the two recommended doses are given, [97% effective](#).
- The combination measles-mumps-rubella vaccine (MMR) and a vaccine that includes these components plus one to prevent chickenpox (MMRV) are the measles-containing vaccines given in the United States since the 1960s.
- People living outside the U.S. may have been given a measles-only vaccine, which is also effective, but may be repeated to prevent mumps and rubella. MMR vaccine is required for school entry, in North Dakota.
- Over 100 peer-reviewed scientific articles and hundreds of independent researchers have studied and confirmed the safety of the measles vaccine in all ages, races, and backgrounds.
- People born prior to 1957 are assumed to have immunity to measles, since the disease was so widespread prior to routine vaccination. People working in health care may need to receive MMR vaccine regardless of date of birth.
- Children under one year old are not routinely given MMR vaccine, yet, and so immunity of those around them to measles is especially important. If an infant is traveling to an area with measles before 12 months of age, but after six months of age, they may receive one dose of MMR vaccine for protection against measles but will need to repeat this dose after they are one year old.
- A first measles vaccine is given at 12 months of age.
- A second measles vaccine is given at four to six years old but may be given as early as 28 days after the first dose is administered.
- People exposed to measles who are unable to receive MMR vaccine may be offered measles vaccine or measles immune globulin (IG) as a form of post-exposure prevention, but this is much less effective than vaccination prior to exposure.

*Cost should not be a barrier to vaccination. The Vaccines for Children (VFC) Program provides all recommended vaccines to children who are American Indian, uninsured or underinsured, and Medicaid-eligible. Many recommended vaccines are also available for uninsured adults. Vaccines are available at your local health care provider, public health department or pharmacy.*

## Quarantine Recommendations

Measles cases are infectious from four days prior to the onset of the rash until four days after the rash developed and are recommended to isolate and be excluded from childcare, school, and all activities until this period has passed. Patients with active measles are recommended to isolate at home away from unimmunized family members. Unimmunized (zero doses of MMR) or under-immunized (one dose of MMR) may receive a dose of MMR within 72 hours of exposure to possibly interrupt development of disease. Unimmunized people who are exposed to measles are recommended to quarantine at home and be excluded from school or childcare for 21 days after exposure, regardless of the reason for not being immunized.

For additional information about measles, contact the North Dakota Department of Health and Human Services' Public Health Division at 800.472.2180.

### Resources:

1. Centers for Disease Control and Prevention. (2020, November 5). *CDC Measles*. Centers for Disease Control and Prevention. Retrieved January 30, 2024 from <https://www.cdc.gov/measles/index.html>.
2. Kimberlin, D. W., Barnett, E. D., Lynfield, R., Sawyer, M. H. (2021) Red Book: 2021-2024 Report of the Committee on Infectious Diseases. 32<sup>nd</sup> ed. American Academy of Pediatrics. [Management and Prevention of Infectious Diseases; Measles] [pages 503-519].

Revised February 25, 2026

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