

Measles

General Information

Measles is caused by a single-stranded, enveloped, RNA virus with 1 serotype. It is classified as a member of the genus Morbillivirus in the Paramyxoviridae family. Humans are the only natural hosts of the measles virus and the virus is not transmitted to animals.

Measles is an acute, highly communicable, vaccine preventable viral respiratory illness. It is characterized by a high fever (as high as 105°F) and malaise, along with the three “C”s: cough, coryza, and conjunctivitis. The rash usually appears on average about 14 days after a person is exposed. The rash spreads from the head to the trunk to the lower extremities. Patients are considered to be contagious from 4 days before to 4 days after the rash appears. Of note, sometimes immunocompromised patients do not develop the rash.

Outbreaks of measles have occurred sporadically in the United States and around the world. Given delays of primary childhood vaccinations across the globe due to the global COVID-19 pandemic, more persons may lack protection against measles.

Please note that measles is a reportable public health condition in both the United States and Canada, and suspected cases should be reported through local public health channels as soon as possible. Healthcare providers should notify their facility’s infection prevention and control coordinators as well.

Symptoms

The symptoms of measles generally appear about seven to 14 days after a person is infected.

Measles typically begins with

- high fever,
- cough,
- runny nose (coryza), and
- red, watery eyes (conjunctivitis).

Two or three days after symptoms begin, tiny white spots (Koplik spots) may appear inside the mouth.

Complications

Measles can be serious in all age groups. However, children younger than 5 years of age and adults older than 20 years of age are more likely to suffer from measles complications.



Common measles complications include ear infections and diarrhea. Ear infections occur in about one out of every 10 children with measles and can result in permanent hearing loss. Diarrhea is reported in less than one out of 10 people with measles.

More severe complications can occur, such as pneumonia (infection of the lungs) and encephalitis (swelling of the brain). The patient may need to be hospitalized and could die.

As many as one out of every 20 children with measles gets pneumonia, the most common cause of death from measles in young children.

About one child out of every 1,000 who get measles will develop encephalitis (swelling of the brain) that can lead to convulsions and can leave the child deaf or with intellectual disability.

For every 1,000 children who get measles, one or two will die from it.

Treatment

There is no specific treatment for measles. Medical care is supportive and aims to relieve symptoms and address complications such as bacterial infections. Healthcare providers are encouraged to review the CDC's most recent treatment recommendations, available at <https://www.cdc.gov/measles/hcp/index.html>. The [Red Book Online](#) is another source of treatment information. Patients and patient caretakers are strongly encouraged to contact their medical providers and their local health jurisdiction if measles is suspected.

Transmission

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. The virus is transmitted by direct contact with infectious droplets, (nasal and throat secretions) or by airborne spread when an infected person breathes, coughs, or sneezes. Measles virus can remain infectious in the air for up to two hours after an infected person leaves an area. Average time frame for incubation is 14 days however the range is 7 -21 days from the time of exposure. Infected people can spread measles to others from four days before through four days after the rash appears. Because persons can spread measles before onset of symptoms, controlling outbreaks is particularly challenging, especially in susceptible (i.e., unvaccinated) populations.

Isolation

Airborne Isolation is required, with infected patients being placed in an Airborne Infection Isolation room (AIIR), also known as negative pressure room, until four days after the onset of rash or for the duration of the illness if the person is immunocompromised. Regardless of presumptive immunity status, all healthcare staff entering the room should use respiratory protection consistent with airborne precautions (use of an N95 respirator or a respirator with similar effectiveness in preventing airborne transmission). Because of the possibility, albeit low, of MMR vaccine failure in healthcare providers exposed to infected patients, they should all observe airborne precautions in caring for patients with measles.



Exposed people without evidence of immunity who have been exempted from measles vaccination for medical, religious, or other reasons and who do not receive appropriate post-exposure prophylaxis (PEP) within the appropriate time frame should be excluded from affected institutions in the outbreak area until 21 days after the onset of rash in the last case of measles.

For more information, visit [Interim Guidance on Infection Prevention and Control Recommendations for Measles in Healthcare settings](#).

Prevention

A measles vaccine is the best way to prevent measles. This vaccine is included in the combination measles-mumps-rubella (MMR) and measles-mumps-rubella-varicella (MMRV) vaccines. Per the CDC, it is critical for all international travelers to be protected against measles by being vaccinated, regardless of their destination.

In addition to vaccination, follow these steps to help prevent illness:
























- Wash your hands often.
- If soap and water aren't available, clean your hands with hand sanitizer (containing at least 60% alcohol).
- Don't touch your eyes, nose, or mouth. If you need to touch your face, make sure your hands are clean.
- Cover your mouth and nose with a tissue or your sleeve (not your hands) when coughing or sneezing.
- Try to avoid close contact, such as kissing, hugging, or sharing eating utensils or cups, with people who are sick.

Environmental Hygiene

- Per the CDC, standard healthcare cleaning and disinfection protocols are adequate for measles virus environmental control. This means, using any EPA-registered healthcare disinfectant is acceptable per its manufacturer's instructions for use.
- The virus can live on contaminated surfaces, such as environmental surfaces (door knobs, faucet handles, light switches) or personal items (cups, utensils) for hours or days. These surfaces can spread the virus to those who are not immune, especially if they share these items or touch contaminated surfaces and then touch their eyes, nose or mouth. Regularly clean surfaces that are frequently touched (such as toys, doorknobs, tables, counters) with a low-or intermediate-level EPA- or DIN-registered disinfectant that is effective against enveloped viruses.
- Measles is an enveloped virus and would be susceptible to any EPA-registered hospital disinfectants.



Following CDC recommendations, any of Diversey’s EPA-registered disinfectants would be expected to inactivate enveloped viruses. These disinfectants are listed below:

Product	Oxivir® 1 RTU / Wipes	Oxivir® Tb RTU / Wipes	Virex® Tb	Oxivir® Five 16	Alpha HP®	Avert™ Sporicidal Disinfectant Cleaner/Wipes	Envy Foam	Virex® Plus	Virex II 256	Expose® II 256	MoonBeam™ 3 UV Disinfection
Contact Time (Min)	1	1	3	5	5	1	3 Min	3	10	10	3 Min
											
Product	Oxivir® Tb RTU / Wipes	Oxivir® Plus (Concentrate)	Virex Plus	Accel® INTERVENTion RTU/Wipes	Virex® II 256	Avert® Disinfectant Cleaner Wipes	Rescue® (Liquid, Gel & Wipes)	Accel® PREVENTion RTU/Wipes	Accel® PREVENTion Concentrate	MoonBeam™ 3 UV Disinfection	
Contact Time (Min)	1	5	3	1	10	1	1	3	5	< 1 min	
											

Resources:

- CDC – <https://www.cdc.gov/measles/index.html>
- CDC. 2019. Interim Infection Prevention and Control Recommendations for Measles in Healthcare Settings. Available at <https://www.cdc.gov/infectioncontrol/guidelines/measles/index.html>.
- Health Canada. 2013. Guidelines for measles outbreak in Canada. Available at <https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2013-39/guidelines-prevention-control-measles-outbreaks-canada.html>.
- Heymann, DL, APHA Press, Control of Communicable Diseases Manual, 20th Edition
- Mayo Clinic – www.mayoclinic.org/diseases-conditions/measles/symptoms-causes/syc-20374857