

# 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 measles virus.

Measles is an acute, 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.

## 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 a 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). They 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's no specific treatment for measles. Medical care is supportive and to help relieve symptoms and address complications such as bacterial infections. Fever reducers such as acetaminophen, ibuprofen or naproxen may be used. Acetylsalicylic acid (aspirin) is not used due to the risk of Reye's syndrome. Severe measles cases among children, such as those who are hospitalized, should be treated with vitamin A.

### **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 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. Infected people can spread measles to others from four days before through four days after the rash appears.

Measles is a disease of humans; measles virus is not spread by any other animal species.

### **Isolation**

Infected people should be isolated for four days after they develop a rash; airborne precautions should be followed in healthcare settings. Regardless of presumptive immunity status, all healthcare staff entering the room should use respiratory protection consistent with airborne infection control 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. The preferred placement for patients who require airborne precautions is in a single-patient airborne infection isolation room (AIIR).

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 timeframe should be excluded from affected institutions in the outbreak area until 21 days after the onset of rash in the last case of measles.

### 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.

To help prevent the transmission of measles, take steps to 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

- 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.

Here is a list of Diversey disinfectants that are effective against enveloped viruses:

Product	Oxivir® 1 RTU / Wipes	Oxivir® Tb RTU / Wipes	Oxivir® Five 16	Alpha® HP Multisurface Disinfectant Cleaner	Avert™ Sporicidal Disinfectant Cleaner/Wipes	Virex® II 256	Virex® Tb	Virex® Plus	Expose® II 256	MoonBeam®3 UV Disinfection
Contact Time (Min)	1	1	5	5	1	5	3	3	10	3
										
Product	Oxivir® Tb RTU / Wipes	Oxivir® Plus (Concentrate)	Virox® 5 Concentrate	Virox® 5 (RTU & Wipes)	Percept <sup>(TM/MC)</sup> (Concentrate, RTU & Wipes)	Virex® II 256	Avert™ Disinfectant Cleaner	MoonBeam®3 UV Disinfection		
Contact Time (Min)	1	5	5	5	5	5	1	3		
										

Sources: CDC, Mayo Clinic