

## FACT SHEET

# Measles, Mumps and Rubella (MMR)

Measles, mumps and rubella (MMR) are vaccine-preventable, potentially serious infectious diseases that can afflict children and adults.

## Vaccination

In the United States, routine MMR vaccination is recommended for children, with the first dose given at 12-15 months and a second dose at 4-6 years. Children between 1 and 12 years of age can get a combination vaccine containing both MMR and varicella (chickenpox) vaccines.

Catch-up MMR vaccination is recommended for children and adolescents who have not received two appropriately spaced doses. Adults who were born after 1956 are advised to get at least one dose of MMR vaccine, unless they can show they have been vaccinated or had all three diseases.

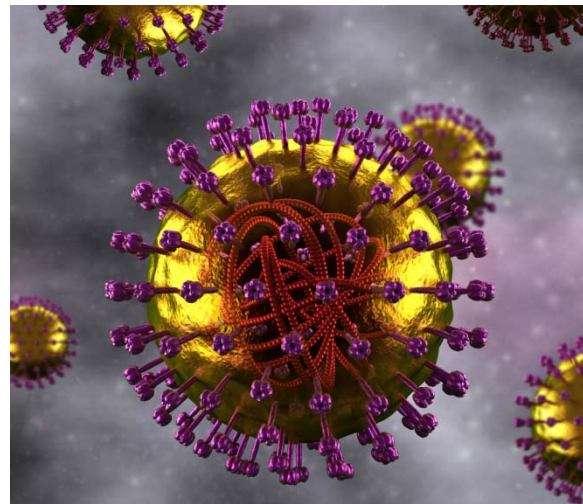
Two appropriately spaced doses of MMR vaccine are recommended for health-care personnel, college students and international travelers. Before travel, one dose of MMR vaccine is recommended for infants 6-to-11-months old. Two doses are recommended for children older than 12 months, with a minimum 28-day interval between doses.

## Measles (Rubeola)

Measles is an acute viral respiratory illness caused by a virus that lives in the nose and throat of an infected person.

Measles is one of the most contagious of all infectious diseases; approximately 9 out of 10 susceptible individuals with close contact to a measles patient will become ill. It is spread through coughing and sneezing; the virus can live for up to two hours on a surface or in the

air. Medical personnel are advised to follow respiratory etiquette and airborne precautions in health-care settings when treating measles patients.



## Measles Infection Risk

Employees who plan to travel internationally are advised to be aware of increased risk for exposure. While measles-related fatalities are rare in the U.S., globally measles is one of the leading causes of death among young children. According to the World Health Organization (WHO), in 2013 there were 145,700 measles deaths among children and adults worldwide.

During the first four months of 2014, there was a sharp spike in reported cases in the U.S. in comparison to the total number of cases reported over the past 18 years, according to the Centers for Disease Control and Prevention (CDC). In California – the state reporting the nation's highest number of measles cases – 58 cases occurred in the first four months of 2014 compared to an average of nine cases reported annually over a 13-year period. The CDC attributes many of these cases to exposure of

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non-immune adults and children while visiting the Philippines, which has been experiencing a measles outbreak.

#### Measles Signs and Symptoms

Measles symptoms generally appear seven to 14 days after a person is infected. About three out of 10 people who get measles develop one or more complications that may include pneumonia, ear infection, diarrhea or seizures. Measles can cause brain damage and death.

Measles is most easily recognized by a rash that usually begins as flat red spots on the face at the hairline and spreads to the neck, trunk, arms, legs and feet. Small raised bumps may also appear on top of spots. Measles typically begins with:

- high fever
- cough
- runny nose (coryza)
- eye irritation (conjunctivitis)

Two to three days after symptoms begin, tiny white spots (Koplik) may appear inside the mouth. When the rash appears, fever may spike to more than 104° Fahrenheit. After a few days, the fever subsides and the rash fades. People at high risk for severe illness and complications from measles include:

- Infants and children under 5 years old
- Adults more than 20 years old
- Pregnant women
- People with compromised immune systems, such as from leukemia or HIV infection

#### Measles treatment

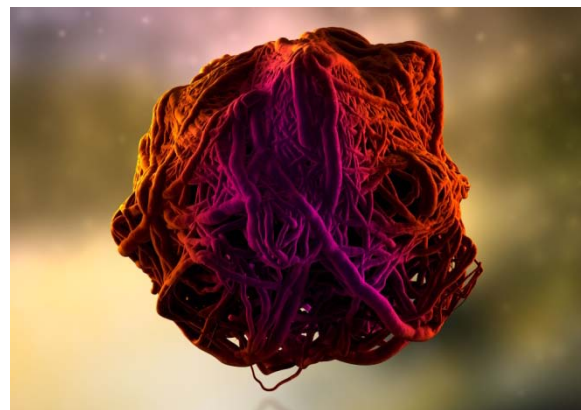
There is no specific antiviral therapy for measles. Supportive medical care helps relieve symptoms and addresses complications such as bacterial infections.

Infectious disease experts say people exposed to measles who cannot readily show that they have evidence of immunity against measles should be offered MMR vaccine. The vaccine, if administered within 72 hours of initial measles exposure, or immunoglobulin (IG), if administered within six days of exposure, may provide some protection or modify the clinical course of disease.

Exclusion from group settings such as schools, health care facilities and the workplace is recommended for people who have been exposed but not yet developed symptoms. Children and adults with measles should be isolated for four days after they develop a rash.

#### Mumps

Mumps is a contagious disease caused by a virus. Anyone who is not immune from either previous mumps infection or from vaccination can get mumps. Unvaccinated children between 5 and 9 years old are most likely to experience mumps as a relatively mild illness, but mumps can cause serious complications in adults.



Mumps is spread by droplets of saliva or mucus from the mouth, nose or throat of an infected person, usually when the person coughs, sneezes or talks. Items used by an infected person, such as cups or soft drink cans, can also

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be contaminated with the virus. In addition, the virus may spread when someone with mumps touches surfaces without washing their hands and someone else touches the same surface and rubs their mouth or nose.

#### Mumps Infection Risk

Most mumps transmission occurs before the salivary glands begin to swell and within five days after swelling begins.

Before routine vaccination was introduced in the United States, mumps was a common illness in infants, children and young adults. Mumps is now a relatedly rare occurrence in the U.S., but 2013 WHO data show a significant number of cases in countries including China, Japan, Spain and the Republic of Korea.

#### Mumps Signs and Symptoms

Mumps typically starts with a few days of fever, headache, muscle aches, tiredness and loss of appetite. It is primarily associated with swollen and tender salivary glands under the ears or jaw on one or both sides of the face. Occasionally serious complications develop and may include:

- Inflammation of the testicles (orchitis) in males who have reached puberty, which rarely leads to sterility
- Inflammation of the brain (encephalitis) and/or tissue covering the brain and spinal cord (meningitis)
- Inflammation of the ovaries (oophoritis) and/or breasts (mastitis) in females who have reached puberty
- Temporary or permanent deafness

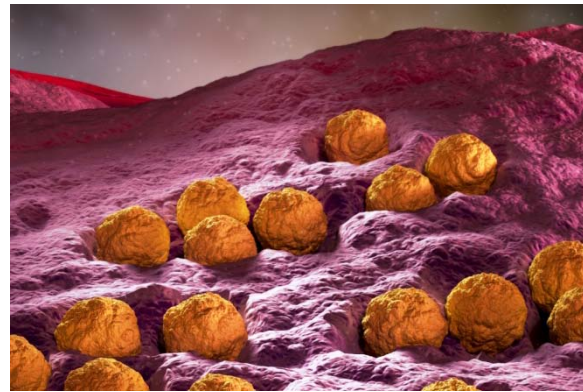
#### Mumps Treatment

Other than supportive care, there is no specific treatment for mumps. Immediate medical attention should be sought in the event of

complications. To help prevent spreading the virus to others, patients are advised to:

- Minimize close contact with other people, especially babies and people with weak immune systems who cannot be vaccinated.
- Stay home from work or school for five days after glands begin to swell
- Follow good hygiene practices

#### Rubella (German Measles)



Rubella is a viral illness characterized by a mild, pink rash. When rubella infection occurs during pregnancy, especially during the first trimester, serious consequences including miscarriages, fetal deaths/stillbirths and severe birth defects can occur. Rare complications include blood clots and encephalitis.

Rubella is transmitted through direct or droplet contact from nose and throat secretions. It has an average incubation period of 17 days. Rubella is most infectious when the rash is erupting, but it can be contagious for seven days before and after rash onset.

#### Rubella Infection Risk

Before the availability of rubella vaccines in the United States, rubella was a common disease that occurred primarily among young children.

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The last major epidemic in the U.S. occurred in 1964-1965, when an estimated 12.5 million rubella cases resulted in 2,000 cases of encephalitis, 11,250 therapeutic or spontaneous abortions, 2,100 neonatal deaths and 20,000 infants born with defects.

Although rubella has virtually been eliminated in the United States, it continues to be endemic in many parts of the world. It is estimated more than 100,000 infants are born with congenital rubella syndrome (CRS) annually worldwide. WHO reports many countries have established targets for accelerated rubella control and CRS prevention goal (<1 case per 100,000) by 2015.

#### Rubella Signs and Symptoms

In children, rubella rash usually starts on the face and spreads to the rest of the body, sometimes accompanied by a low fever that lasts two or three days. The rash occurs in 50-80 percent of cases and is sometimes misdiagnosed as measles or scarlet fever.

Older children and adults may have swollen glands and cold-like symptoms before the rash appears. Aching joints occur in many cases, especially among young women. Other adult symptoms may include headache, malaise, mild coryza and conjunctivitis for up to five days. Swollen lymph nodes also are characteristic of rubella before the rash appears. Arthritis may occur in women.

#### Rubella Treatment

No treatment will shorten the course of rubella infection. In most cases, symptoms are so mild that medical intervention isn't necessary. Isolation from others—especially pregnant women—during the infectious period is recommended.

#### Resources

1. Centers for Disease Control and Prevention: [www.cdc.gov](http://www.cdc.gov)
2. Measles – United States, Jan. 1–May 23, 2014, Morbidity and Mortality Weekly Report, June 6, 2014, 63(22); 496-499.
3. Manual for the Surveillance of Vaccine-Preventable Diseases, Vaccines and Immunizations, Chapter 14: Rubella; McLean H, et al.; CDC, April 1, 2014.
4. WorkCare, Inc.: [www.workcare.com](http://www.workcare.com)

#### Measles

Measles virus causes rash, cough, runny nose, eye irritation and fever. It is highly contagious and can cause seizures, brain damage and death.

#### Mumps

Mumps virus causes fever, headache, muscle pain, loss of appetite and swollen glands. It can have serious consequences for adults.

#### Rubella (German Measles)

Rubella virus causes rash, arthritis (mostly in women) and mild fever. While a mild childhood illness, if a pregnant woman gets rubella, she could have a miscarriage or her baby could be born with serious birth defects.

These diseases are spread from person to person through the air and by coming into contact with infected surfaces. Measles, mumps and rubella (MMR) vaccine helps protect children and adults from acquiring all three of these diseases. Washing your hands frequently and covering your nose and mouth when coughing and sneezing are always a good practices to help prevent the spread of infectious disease.