# Common Cold

The common cold is a mild viral infection that primarily affects the upper respiratory tract, including the nose and throat. It is caused by various viruses, with the rhinovirus being the most common. The infection is generally harmless, but it can be uncomfortable and lasts about a week or two.

**Diagnosis:** You usually don't need medical care for a common cold. But if symptoms get worse or don't go away, see your health care provider.Most people with a common cold can be diagnosed by their symptoms. Your care provider may take a nasal or throat swab to rule out other illnesses. A chest X-ray may be ordered to rule out a lung illness.

**Treatment**

There's no cure for the common cold. Most cases of the common cold get better without treatment within 7 to 10 days. But a cough may last a few more days.The best thing you can do is take care of yourself while your body heals. Care tips include:

Rest.

Drink plenty of liquids.

Humidify the air.

Use saline nasal rinses.

Antibiotics do not treat cold viruses. They are used to treat illnesses caused by bacteria.

**Pain relievers**

Pain relievers you can buy without a prescription can lessen the discomfort of a sore throat, headache or fever.

**For adults.** Nonprescription pain relief for adults includes:

Acetaminophen (Tylenol, others).

Ibuprofen (Advil, Motrin IB, others).

**For children.** Guidelines for pain relief medicines for children include the following:

Do not give children or teenagers aspirin. Aspirin has been linked to Reye's syndrome, a rare life-threatening condition, in children or teenagers who have the flu or chickenpox.

Use children-strength, nonprescription pain relievers. These include children's acetaminophen (Tylenol, others) or ibuprofen (Advil, Motrin, others).

For children younger than 3 months old, don't use acetaminophen until your baby has been seen by a health care provider.

Don't give ibuprofen to a child younger than 6 months old or to children who are vomiting frequently.

Use these medicines for the shortest time possible and follow label directions to avoid side effects.

Call your health care provider if you have questions about the right dose.

### Decongestant nasal sprays

**For adults.** Adults can use decongestant drops or sprays for up to five days. These help a stuffy nose. Prolonged use can cause the return of symptoms.

**For children.** Children younger than 6 years old shouldn't use decongestant drops or sprays. Talk to your doctor before using nasal decongestants in children older than 6 years.

### Cough syrups

Nonprescription cough and cold medicines are used to treat the symptoms of coughs and colds, not the underlying disease. Research suggests that these medicines don't work any better to treat colds than a placebo, an inactive medicine used in research.

**For adults.** Follow these tips for nonprescription cough and cold medicines:

- Read and follow the label directions.
- Don't take two medicines with the same active ingredient, such as an antihistamine, decongestant or pain reliever. Too much of a single ingredient could lead to an accidental overdose.

**For children.** Nonprescription cough and cold medicines aren't typically recommended for children. These medicines have potentially serious side effects, including fatal overdoses in children younger than 2 years old. Talk to your child's doctor before using any nonprescription cough and cold medicine in children.

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## Lifestyle and home remedies

To make yourself as comfortable as possible when you have a cold, try these tips:

- **Drink plenty of fluids.** Water, juice, clear broth or warm lemon water are good choices. Avoid caffeine and alcohol, which can increase fluid loss.
- **Sip warm liquids.** Chicken soup, tea, warm apple juice or other warm liquids can soothe a sore throat and loosen a stuffy nose. Honey may help coughs in adults and children who are older than age 1. Try it in hot tea. Do not give honey to children younger than 1 year old because of the risk of an illness called infant botulism.
- **Rest.** Rest as much as possible. Stay home from work or school if you have a fever or a bad cough. Do not go out if you are drowsy after taking medicine.
- **Adjust your room's temperature and humidity.** Keep your room warm, but not overheated. If the air is dry, a cool-mist humidifier can help with stuffiness and coughing. Clean your humidifier as directed to prevent the growth of bacteria and molds.
- **Use a saltwater gargle.** A saltwater gargle of 1/4 to 1/2 teaspoon (1250 to 2500 milligrams) of table salt in 4 to 8 fluid ounces (120 to 240 milliliters) of warm water can help soothe a sore throat. Gargle the solution and then spit it out. Most children younger than 6 years aren't able to gargle properly.

**Try other throat soothers.** Use ice chips, lozenges or hard candy to soothe a sore throat. Use caution when giving lozenges or hard candy to children because they can choke on them. Don't give lozenges or hard candy to children younger than 6 years.

**Try saline nasal drops or sprays.** Saline nasal drops or sprays can keep nasal passages moist and loosen mucus.

**Use a suction bulb for younger children.** In infants and younger children, apply saline nasal drops, wait for a short period and then use a suction bulb to draw mucus out of each nostril. Insert the bulb syringe about 1/4 to 1/2 inch (6 to 12 millimeters).

# Influenza(Flu)

### Diagnosis

**Flu vaccines at Mayo Clinic**

To diagnose the flu, also called influenza, your healthcare professional does a physical exam, looks for symptoms of flu and possibly orders a test that detects flu viruses.

The viruses that cause flu spread at high levels during certain times of the year in the Northern and Southern hemispheres. These are called flu seasons. During times when flu is widespread, you may not need a flu test.

But a test for flu may be suggested to help guide your care or to know if you could spread the virus to others. A flu test may be done by a pharmacy, your healthcare professional's office or in the hospital.

Types of flu tests you may have include:

**Molecular tests.** These tests look for genetic material from the flu virus. Polymerase chain reaction tests, shortened to PCR tests, are molecular tests. You also may hear this type of test called an NAAT test, short for nucleic acid amplification test.

**Antigen tests.** These tests look for viral proteins called antigens. Rapid influenza diagnostic tests are one example of antigen tests.

It's possible to have a test to diagnose both flu and other respiratory illness, such as COVID-19, which stands for coronavirus disease 2019. You may have both COVID-19 and influenza at the same time.

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### Treatment

If you have a severe infection or are at high risk of complications from a flu infection, your healthcare professional may prescribe an antiviral medicine to treat the flu. These medicines can include oseltamivir (Tamiflu), baloxavir (Xofluza) and zanamivir (Relenza).

You take oseltamivir and baloxavir by mouth. You inhale zanamivir using a device similar to an asthma inhaler. Zanamivir shouldn't be used by anyone with certain chronic respiratory problems, such as asthma and lung disease.

People who are in the hospital may be prescribed peramivir (Rapivab), which is given in a vein.

These medicines may shorten your illness by a day or so and help prevent serious complications.

Antiviral medicine may cause side effects. The side effects often are listed on the prescription information. In general, antiviral medicine side effects may include breathing symptoms, nausea, vomiting or loose stools called diarrhea.

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### Lifestyle and home remedies

If you have the flu, these measures may help ease your symptoms:

- **Drink plenty of liquids.** Choose water, juice and warm soups to help keep fluids in your body.

- **Rest.** Get more sleep to help your immune system fight infection. You may need to change your activity level, depending on your symptoms.

- **Consider pain relievers.** Use acetaminophen (Tylenol, others) or ibuprofen (Advil, Motrin IB, others) for fever, headache or achiness associated with influenza. Children and teens recovering from flu-like symptoms should never take aspirin because of the risk of Reye's syndrome, a rare but potentially fatal condition.

To help control the spread of influenza in your community, stay home and keep sick children home until the fever is gone, without the use of medicine, for 24 hours. Unless you're going to a medical appointment, avoid being around other people until you're feeling better. If you need to leave your home to get medical care, wear a face mask. Wash your hands often.

# COVID-19

### Diagnosis

If you have symptoms of coronavirus disease 2019, known as COVID-19, or you've been exposed to the COVID-19 virus, contact your healthcare team. Let them know if you've had close contact with anyone diagnosed with COVID-19.

In the United States, at-home COVID-19 tests are available. Free tests can be mailed to U.S. addresses, or you can purchase tests in stores, pharmacies or online. The U.S. Food and Drug Administration, also known as the FDA, approves or authorizes the tests. On the FDA website, you can find a list of the tests that are validated and their expiration dates. You also can check with your healthcare professional before buying a test if you have any concerns.

When taking a test at home, read the directions that come with the test carefully. Follow the instructions exactly to get as accurate a result as possible.

COVID-19 tests also are available from healthcare professionals, some pharmacies and clinics, or at community testing sites.

Here are some guidelines for when to take a COVID-19 test:

- If you have COVID-19 symptoms, test for the illness right away.

If you were exposed to the COVID-19 virus but don't have symptoms, wait at least five days after exposure then test.

If you have symptoms and tested positive for COVID-19 within the last 30 days, you can test again. But if you were just exposed to the coronavirus and don't have symptoms, you don't need to test.

Also, testing before an event or contact with people at high risk of serious illness helps prevent the spread of the virus that causes COVID-19.

COVID-19 tests use a sample taken from your nose or throat, or a sample of saliva.

Two types of tests can help diagnose COVID-19.

**Molecular tests.** These tests look for genetic material from the COVID-19 virus. Polymerase chain reaction tests, shortened to PCR tests, are molecular tests. You may also see this type of test called an NAAT test, short for nucleic acid amplification test.
PCR tests are more accurate than the other type of COVID-19 test, called an antigen test. PCR tests may be done at home. But they are much more likely to be done by a healthcare professional and processed in a lab.

**Antigen tests.** These tests look for viral proteins called antigens.
Antigen tests also may be called rapid COVID-19 tests or at-home COVID-19 tests. These tests are useful if you need a quick result.
Antigen tests are reliable and accurate, but they are less accurate than PCR tests. This is especially true if you don't have symptoms. If you take an antigen test and are negative for COVID-19, take another antigen test after 48 hours to get the most accurate result.

**Understanding test results**

If you have a positive COVID-19 PCR or antigen test, you almost certainly have COVID-19. Another test isn't needed.

If you get a negative PCR test, you most likely do not have COVID-19.

If you have a negative antigen test, the FDA recommends that you repeat an antigen test two days after the first test. With or without symptoms, repeating the test helps get the correct diagnosis.

If you test positive, call a healthcare professional immediately to find out what options are available.

**Preventing the spread of the COVID-19 virus while sick**

To prevent the spread of the COVID-19 virus to others, stay home and apart from anyone you live with for as long as you have worsening symptoms. If you have a weakened immune system, you will likely need to isolate for longer. How long depends on your symptoms and personal health history. Your healthcare professional can advise you on what's best in your situation.

If you must be around others, a face mask helps lower the spread of this coronavirus. During this time, try not to share things like cups or towels, and use a separate bathroom and bedroom. It can help to get more airflow in your home as well.

Once you're feeling better and haven’t had a fever for a full 24 hours, and you haven’t taken medicine for fever during that time, you can go back to being around others. If your fever returns or you start to feel worse, return to isolation until your symptoms improve and you are fever-free without medicine for 24 hours. But listen to the advice of your healthcare professional.

In the five days after isolation, to help prevent the spread of the COVID-19 virus you can wear a mask, wash your hands, keep your distance from others, test for COVID-19 infection and improve airflow. These actions are helpful even if you never had symptoms but tested positive for COVID-19.

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**Treatment**

Many people with COVID-19 recover with rest, plenty of fluids and care that manages symptoms. Medicine you can get without a prescription can help, such as:

- Fever reducers.
- Pain relievers, such as ibuprofen or acetaminophen.
- Cough syrup or medicine.

If you are at high risk of serious COVID-19 illness, your healthcare professional may suggest medicine to prevent mild illness from getting worse. These medicines can include nirmatrelvir and ritonavir (Paxlovid), remdesivir (Veklury) or molnupiravir (Lagevrio).

Paxlovid and Lagevrio are taken by mouth as pills. Veklury is given through a needle in a vein.

If you're very ill, you may need to be treated in the hospital.

**Treatment for serious COVID-19 illness**

For people who are in the hospital for COVID-19 care, care is given based on a person's immune system response and the need for oxygen support.

Added oxygen may be given through a tube in the nose. Some people may need to have a tube placed in their airway to push air into the lungs. That's called mechanical ventilation. In very severe situations, a machine called extracorporeal membrane oxygenation, also known as ECMO, can be used to mimic the function of the heart and lungs.

Medicines for severe COVID-19 may be remdesivir, baricitinib (Olumiant) and tocilizumab (Actemra), or a corticosteroid such as dexamethasone.

Baricitinib is a pill. Tocilizumab is an injection. Dexamethasone may be either a pill or given through a needle in a vein.

Another option may come from blood donated by people who have recovered from COVID-19, called convalescent plasma. The blood is processed to remove blood cells, leaving behind a liquid called plasma that has immune system proteins called antibodies. Convalescent plasma with high antibody levels may be used to help people with a weakened immune system recover from COVID-19.

# Measles

Measles is caused by the rubeola virus. It spreads through direct contact with a person with the virus or through droplets in the air. Measles is a highly contagious condition that can lead to life-threatening complications.

## Symptoms

Measles is a viral disease that causes uncomfortable symptoms and can lead to life-threatening or life-changing complications.

The CDC state that symptoms usually appear 7–14 days

after exposure. However, according to the WHO, they can take up to 23 days.

Symptoms include:

a fever, possibly up to 104°F (40°C)

a cough

a runny nose

sneezing

watery eyes

body aches

small white spots in the mouth, appearing 2–3 days after early symptoms

a red rash, appearing around 3–5 days after symptoms start

The rash usually starts at the hairline and spreads down through the body. It may begin as flat, red spots, but small bumps may appear on top. The spots may join together as they spread.

## Complications

Complications can arise, some of which can be severe.

They include

vision loss

encephalitis, an infection that causes brain swelling

severe diarrhea and dehydration

additional infections

pneumonia and other respiratory infection

During pregnancy, measles can lead to:

loss of pregnancy

early delivery

low birth weight

Those most at risk of complications include:

people with a weakened immune system

very young children

adults over the age of 20 years

pregnant women

**Causes**

Infection with the rubeola virus causes measles.

**How symptoms develop**

The virus enters the body through the mouth, nose, or eyes

. Once there, it most likely enters the lungs, where it infects immune cells.

These cells move to the lymph nodes, where the virus transfers to other cells. These cells travel through the body, releasing virus particles into the blood.

As the blood travels around the body, it carries the virus to different body organs, including the liver, the skin, the central nervous system, and the spleen.

In the skin, the measles virus causes inflammation in the capillaries. This gives rise to the hallmark measles rash.

The virus crosses the blood-brain barrier and enters the brain in around 1 in 1,000 people

. This can cause swelling in the brain that may be life-threatening.

An infection in the lungs causes a person to cough, which transmits the virus to other people.

Anyone who has never had measles or the vaccination can become ill if they breathe in infected droplets or are in close physical contact with someone who has measles.

**How does it spread?**

The disease is contagious. The CDC indicate that a person can transmit the virus from 4 days before and about 4 days after the rash appears.

The infection spreads through:

physical contact with a person who has measles

being near a person with measles when they cough or sneeze

touching a surface with the virus on and then putting fingers into the mouth, or rubbing the nose or eyes

After a person coughs or sneezes, the virus remains active in the air for around 2 hours

If one person has measles, they can pass it to up to 90% of those around them, unless they have immunity or have had the vaccination Measles only affects humans. No animal species can transmit it.

**When to see a doctor**

A person should see a doctor if:

they have symptoms that could indicate measles

the fever rises over 100.4º F (38º C)

there is chest pain or breathing difficulty

they cough up blood

there are signs of confusion or drowsiness

they experience a convulsion

A doctor can usually diagnose measles by looking at the signs and symptoms, but they may order a blood test to confirm a diagnosis.

**Treatment**

There is no specific treatment for measles, and symptoms usually go away within 7 to 10 days.

If there are no complications, the doctor will recommend rest and plenty of fluids to prevent dehydration. If there is a risk of complications, the doctor may recommend spending time in the hospital.

If a child needs treatment in the hospital, a doctor will prescribe vitamin A.

The following tips may help manage symptoms:

Pain and fever: Tylenol or ibuprofen can help manage a fever, aches, and pains. A doctor can advise on options for young children. Children under 16 years should not take aspirin.

A cough: Use a humidifier or put a wet towel on a warm radiator to moisten the air. A warm lemon and honey drink may help, but do not give honey to babies under 1 year.

Dehydration: Encourage the person to drink plenty of fluids.

Eyes: Remove any crustiness with cotton wool soaked in water. Dim the lights if the eyes are hypersensitive.

The measles is a viral infection, and antibiotics will not help. However, a doctor may prescribe them if a person develops an additional bacterial infection.

Tylenol or ibuprofen are available for purchase online.

**Prevention**

After a person has measles once, they usually have immunity and are unlikely to have it again.

A doctor will usually recommend vaccination for those who have not had measles and do not have immunity.

**Measles vaccination**

In the United States, the CDC recommend that people have the measles, mumps, and rubella (MMR) vaccine as follows:

one shot at 12–15 months of age

a booster shot at 4–6 years, before starting school

Newborns have immunity from their mother for several months after birth if the mother has immunity.

In some cases, however, a doctor may recommend vaccination before the age of 12 months. This may happen if there is a risk of an outbreak in the area where they live.

Adults do not need a vaccine in the U.S. if:

They were born or lived in the U.S. before 1957 unless they work in a healthcare setting

and have no evidence of immunity.

They received at least one MMR shot after the age of 12 months, or two doses for those at high risk, such as healthcare workers.

A blood test shows they have immunity.

Some people should not have the vaccine. They include those who:

are pregnant or may be pregnant

have certain allergies

have a personal or family history of immune system problems

have tuberculosis

currently feel moderately to severely unwell

have had another vaccination within the last 4 weeks

Anybody who is not sure whether they should have the vaccine should ask their doctor for advice.

# Mumps

Mumps is an illness caused by a virus. It usually affects the glands on each side of the face. These glands, called parotid glands, make saliva. Swollen glands may be tender or painful.

There are three pairs of major salivary glands — parotid, sublingual and submandibular. Each gland has its own tube (duct) leading from the gland to the mouth.

Mumps are not common in the United States because of vaccines. But outbreaks do happen. People who are not vaccinated are at high risk of infection. Vaccinated people who get mumps usually have milder symptoms and fewer complications.

There is no specific medicine for mumps. Treatment relieves pain and discomfort.

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**Symptoms**

Symptoms of mumps show up about 2 to 3 weeks after exposure to the virus. Some people may have no symptoms or very mild symptoms.

The first symptoms may be similar to flu symptoms such as:

Fever.

Headache.

Muscle aches or pain.

Not wanting to eat.

Tiredness.

Swelling of the salivary glands usually starts within a few days. Symptoms may include:

Swelling of one or both glands on the sides of the face.

Pain or tenderness around the swelling.

Less often, swelling of glands below the floor of the mouth.

**Causes**

Mumps is caused by a type of germ called a virus. When someone has mumps, the virus is in saliva. Coughing or sneezing can release tiny droplets with the virus into the air.

You can get the virus by breathing in tiny droplets. Or you can get the virus by touching a surface where droplets have landed and then touching your face. You also can pick up the virus from direct contact, such as kissing or sharing a water bottle.

Outbreaks in the United States most often happen where people live or work in close contact. These may include college campuses, summer camps and schools.

## Complications

Complications of mumps are more likely among people who aren't vaccinated. They can happen even if a person didn't have swollen salivary glands.

Complications happen when the virus reaches other tissues in the body. Complications may include:

**Swollen testicles.** This complication, also called orchitis, causes severe pain. It's more common with a mumps infection after puberty. A swollen testicle may lead to a decrease in the size of the testicle and a decline in fertility.

**Swollen ovaries.** This complication, also caused oophoritis, causes pain, upset stomach, vomiting and fever. This complication is more likely after puberty. The condition doesn't seem to affect fertility.

**Encephalitis**. Encephalitis is swelling, called inflammation, in the brain that may damage tissues. This complication can cause changes in consciousness, seizures and loss of muscle control.

**Meningitis.** Meningitis is swelling, or inflammation, of the membranes around the brain and spinal cord. It may cause head, fever and neck stiffness. Meningitis related to mumps rarely causes long-term problems.

**Hearing loss.** This complication can happen suddenly or over time. Hearing usually gets better after the illness.

**Pancreatitis.** Mumps can cause damage to the pancreas, called pancreatitis, from swelling. Symptoms may include pain or tenderness near the stomach, upset stomach, vomiting and fever.

**Miscarriage.** Getting mumps during the first 12 weeks of pregnancy may increase the risk that a pregnancy will end, called miscarriage.

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## Prevention

Most people who have had the mumps vaccines, called fully vaccinated, are protected from mumps infections. People who aren't vaccinated are more likely to get mumps.

For some people, vaccine protection may go down over time. When fully vaccinated people get mumps, they usually have milder symptoms and fewer complications.

### The MMR vaccine

The mumps vaccine is a part of the recommended childhood vaccinations. It's usually given as a combined measles-mumps-rubella (MMR) vaccine. The schedule is:

The first dose between the ages of 12 and 15 months.

The second dose between the ages of 4 and 6 years before entering school.

Another version of measles-mumps-rubella (MMR) includes the vaccine against the virus that causes chickenpox, called varicella-zoster virus. But that vaccine, called the

measles-mumps-rubella-varicella vaccine (MMRV) is not used for the first dose in the standard vaccination schedule for children.

Extensive studies in several countries have shown that there is no link between the MMR or measles-mumps-rubella-varicella (MMRV) vaccines and autism. The original study that suggested this connection in 1998 was based on scientific errors. That study was removed from the scientific record in 2010.

Extensive reports from the American Academy of Pediatrics, the National Academy of Medicine, and the Centers for Disease Control and Prevention conclude that there is no scientifically proven link between the MMR vaccine and autism.

**People who need the MMR vaccine**

If you haven't had two doses or aren't sure, talk to your health care provider. You may need two doses of the vaccine or a booster. This is especially important if you are in a high-risk setting or in an outbreak. The following people may need proof of vaccination or more doses:

College students.

People in the military.

International travelers.

Health care workers.

**People who don't need the MMR vaccine**

If you're not sure if you're vaccinated, a blood test can show whether you have antibodies to mumps. If you have antibodies to the virus, then your immune system would fight a mumps infection and you don't need another vaccine.

People who were born before 1957 were likely exposed to the virus. They likely are immune to mumps.

The mumps vaccine is made from a weak but still infectious mumps virus. A typical immune system can handle this weak virus easily. But people with immune systems that won't respond quickly or strongly to the vaccine don't usually get this vaccine. But there are some exceptions if the benefits outweigh the risks. Also, this type of vaccine is not suggested for people who are pregnant.

**Side effects of the MMR vaccine**

The MMR vaccine is safe and effective. Most people have no side effects.

If they happen, mild side effects may include:

Soreness at the site of the shot.

Fever.

Rash at the site of the shot.

Swelling of the glands in the cheeks or neck.

In rare cases, some people may have symptoms such as pain and stiffness in joints, seizures, short-term drop in blood platelets or a rash.

Severe allergic reactions are rare. People who have a severe allergic reaction to the first dose aren't given a second dose. Also, people won't get the vaccine if they've had a severe allergic reaction to an ingredient in the vaccine.

**Mumps**

A common symptom of mumps is painful swelling on one or both sides of the face.

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**When to see a doctor**

See your health care provider if you or your child has symptoms of mumps. Mumps spreads very easily for about five days after the swelling starts. If you think you have mumps, let the clinic know before you go. The clinic staff likely will take steps to prevent the spread of disease.

Other conditions may have similar symptoms, so it's important to get a quick diagnosis.

If you think your child has mumps, call your care provider if your child develops:

Fever of 103 F (39 C) or greater.

Trouble eating or drinking.

Confusion or disorientation.

Stomach pain.

Pain and swelling of the testicles.

In the meantime:

Rest as much as possible.

Use pain relievers you can get without a prescription, such as ibuprofen (Advil, Motrin IB, others) and acetaminophen (Tylenol, others).

Use a cold or warm cloth over swollen salivary glands.

**Treatment :** There is no specific treatment for mumps. Most people recover within 3 to 10 days.

Steps you can take to aid recovery and lessen symptoms include:

Rest.

Pain relievers that you can get without a prescription such as ibuprofen (Advil, Motrin IB, others) and acetaminophen (Tylenol, others).

A cold or warm cloth for swollen salivary glands.

A cold cloth or ice pack for swollen testicles.

Drinking plenty of fluids.

It's important to isolate yourself or your child during the illness to prevent spreading the infection. Avoid contact with others until at least five days after the start of swollen salivary glands

# Rubella

Rubella is a contagious viral infection best known by its distinctive red rash. It's also called German measles or three-day measles. This infection may cause mild or no symptoms in most people. However, it can cause serious problems for unborn babies whose mothers become infected during pregnancy.
Rubella isn't the same as measles, but the two illnesses share some signs and symptoms, such as the red rash. Rubella is caused by a different virus than measles, and rubella isn't as infectious or as severe as measles.
The measles-mumps-rubella (MMR) vaccine is safe and highly effective in preventing rubella. The vaccine provides lifelong protection against rubella.
In many countries, rubella infection is rare or even nonexistent. However, because the vaccine isn't used everywhere, the virus still causes serious problems for babies whose mothers are infected during pregnancy.

**Rubella**

Rubella results in a fine, pink rash that appears on the face, the trunk (shown in image), and then the arms and legs.

**Products & Services**

A Book: Mayo Clinic Guide to a Healthy Pregnancy

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**Symptoms**

The signs and symptoms of rubella are often difficult to notice, especially in children. Signs and symptoms generally appear between two and three weeks after exposure to the virus. They usually last about 1 to 5 days and may include:

- Mild fever of 102 F (38.9 C) or lower
- Headache
- Stuffy or runny nose
- Red, itchy eyes
- Enlarged, tender lymph nodes at the base of the skull, the back of the neck and behind the ears
- A fine, pink rash that begins on the face and quickly spreads to the trunk and then the arms and legs, before disappearing in the same order
- Aching joints, especially in young women

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**When to see a doctor**

Contact your health care provider if you think you or your child may have been exposed to rubella or if you notice the signs or symptoms that may be rubella.
If you're considering getting pregnant, check your vaccination record to make sure you've received your measles-mumps-rubella (MMR) vaccine. If you're pregnant and you develop rubella, especially during the first trimester, the virus can cause death or serious birth defects in the developing fetus. Rubella during pregnancy is the most common cause of congenital deafness. It's best to be protected against rubella before pregnancy.
If you're pregnant, you'll likely undergo a routine screening for immunity to rubella. But if you've never received the vaccine and you think you might have been exposed to rubella, contact your health care provider immediately. A blood test might confirm that you're already immune.
Request an appointment

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**Causes**

Rubella is caused by a virus that's passed from person to person. It can spread when an infected person coughs or sneezes. It can also spread by direct contact with infected mucus from the nose and throat. It can also be passed on from pregnant women to their unborn children through the bloodstream.
A person who has been infected with the virus that causes rubella is contagious for about one week before the onset of the rash until about one week after the rash disappears. An infected person can spread the illness before the person realizes he or she has it.
Rubella is rare in many countries because most children are vaccinated against the infection at an early age. In some parts of the world, the virus is still active. This is something to consider before going abroad, especially if you're pregnant.
Once you've had the disease, you're usually permanently immune.

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### Complications

Rubella is a mild infection. Some women who have had rubella experience arthritis in the fingers, wrists and knees, which generally lasts for about one month. In rare cases, rubella can cause an ear infection or inflammation of the brain.
However, if you're pregnant when you get rubella, the effect on your unborn child may be severe, and in some cases, fatal. Up to 90% of infants born to mothers who had rubella during the first 12 weeks of pregnancy develop congenital rubella syndrome. This syndrome can cause one or more problems, including:

- Growth delays
- Cataracts
- Deafness
- Problems with the development of the heart (congenital heart defects)
- Problems with the development of other organs
- Problems with mental development and learning

The highest risk to the fetus is during the first trimester, but exposure later in pregnancy also is dangerous.

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### Prevention

The rubella vaccine is usually given as a combined measles-mumps-rubella (MMR) vaccine. This vaccine may also include the chickenpox (varicella) vaccine — MMRV vaccine. Health care providers recommend that children receive the MMR vaccine between 12 and 15 months of age, and again between 4 and 6 years of age — before entering school.
The MMR vaccine prevents rubella and protects against it for life. Getting the vaccine can prevent rubella during future pregnancies.
Babies born to women who have received the vaccine or who are already immune are usually protected from rubella for 6 to 8 months after birth. If a child requires protection from rubella before 12 months of age — for example, for certain foreign travel — the vaccine can be given as early as 6 months of age. But children who are vaccinated early still need to be vaccinated at the recommended ages later.
Providing the MMR vaccine as a combination of recommended vaccines can prevent delays in protection against measle, mumps and rubella — and with fewer shots. The combination vaccine is as safe and effective as the vaccines given separately.

### No proven link between the MMR vaccine and autism

Widespread concerns have been raised about a possible link between the MMR vaccine and autism. However, extensive reports from the American Academy of Pediatrics, the National Academy of Medicine, and the Centers for Disease Control and Prevention conclude that there is no scientifically proven link between the MMR vaccine and autism.
These organizations note that autism is often identified in toddlers between the ages of 18 and 30 months, which is about the time children are given their first MMR vaccine. But this coincidence in timing shouldn't be mistaken for a cause-and-effect relationship.

### Do you need the MMR vaccine?

You **don't** need a vaccine if you:

- Had two doses of the MMR vaccine after 12 months of age.
- Have

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### Self care

Simple self-care measures are required when a child or adult is infected with the virus that causes rubella, such as:

- Bed rest
- Acetaminophen (Tylenol, others) for relief from fever and aches

Use caution when giving aspirin to children or teenagers. Though aspirin is approved for use in children older than age 3, children and teenagers recovering from chickenpox or flu-like

symptoms should never take aspirin. This is because aspirin has been linked to Reye's syndrome, a rare but potentially life-threatening condition, in such children. For treatment of fever or pain, consider giving your child infants' or children's over-the-counter fever and pain medications such as acetaminophen (Tylenol, others) or ibuprofen (Advil, Motrin, others) as a safer alternative to aspirin.

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### Preparing for your appointment

As you prepare for your appointment, it's a good idea to write down any questions you have. Your health care provider is likely to ask you a number of questions as well. Being ready to answer them may reserve time to go over any points you want to spend more time on.
Your provider may ask:

- Have you been vaccinated for rubella?
- How long have you had signs or symptoms, such as a rash or aching joints?
- Have you been exposed to anyone with rubella?
- Have you traveled to other countries in recent weeks? Which countries?
- Does anything seem to improve your symptoms?
- Does anything seem to worsen your symptoms?
- When you check in for the appointment, be sure to tell the check-in desk that you suspect an infectious disease. You and your child may be asked to wear a face mask or shown to an exam room immediately. blood tests that show you're immune to measles, mumps and rubella.
- Were born before 1957. People born before 1957 are likely to have had measles, mumps and rubella during childhood and are immune. However, without a blood test that shows immunity, the MMR vaccine is recommended.

**Get** a vaccine if you have not had two doses of the MMR vaccine after age 12 months or a blood test to show that you're immune to measles, mumps and rubella.
Ensuring immunity is especially important if you:

- Are a nonpregnant woman of childbearing age
- Attend college, trade school or postsecondary school
- Work in a hospital, medical facility, child-care center or school
- Plan to travel overseas or take a cruise

The vaccine is **not** recommended for:

- Pregnant women or women who plan to get pregnant within the next four weeks
- People who have had a life-threatening allergic reaction to gelatin, the antibiotic neomycin or a previous dose of MMR vaccine

If you have cancer, a blood disorder or another disease, or you take medication that affects your immune system, talk to your health care provider before getting an MMR vaccine.

### Side effects of the vaccine

Most people experience no side effects from the vaccine.
For some people, minor side effects may appear about two weeks after vaccination, but usually occur less often after the second shot. These can include:

- Sore arm at the injection site
- Fever
- Mild rash or redness at the injection site

Very few people experience:

- Temporary joint pain or stiffness, especially in teens and adult women who weren't previously immune to rubella
- Swelling of the glands in the cheeks or neck
- Seizures that occur with a fever
- Low level of cells in the blood that help with clotting (platelets), which can cause unusual bleeding or bruising
- Rash all over the body
- Serious allergic reaction, very rarely

### After a diagnosis

If you've been exposed to the virus and get rubella, you can help keep friends, family and co-workers safe by telling them about your diagnosis. If your child has rubella, let the school or child-care provider know.

### Diagnosis

The rubella rash can look like many other viral rashes. So health care providers usually confirm rubella with the help of lab tests. You may have a virus culture or a blood test, which can detect the presence of different types of rubella antibodies in your blood. These antibodies show whether you've had a recent or past infection or a rubella vaccine.

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### Treatment

No treatment shortens the course of rubella infection, and symptoms don't usually need to be treated because they're often mild. However, health care providers usually recommend isolation from others — especially from pregnant women — during the infectious period. Isolate from others as soon as rubella is suspected and until at least seven days after the rash disappears.
Support of an infant born with congenital rubella syndrome varies depending on the extent of the infant's problems. Children who have multiple complications may require early treatment from a team of specialists.

Chickenpox is an illness caused by the varicella-zoster virus. It brings on an itchy rash with small, fluid-filled blisters. Chickenpox spreads very easily to people who haven't had the disease or haven't gotten the chickenpox vaccine. Chickenpox used to be a widespread problem, but today the vaccine protects children from it.

The chickenpox vaccine is a safe way to prevent this illness and the other health problems that can happen during it.

# Chickenpox

A Book: Mayo Clinic Guide to Your Baby's First Years

## Symptoms

The rash caused by chickenpox appears 10 to 21 days after you're exposed to the varicella-zoster virus. The rash often lasts about 5 to 10 days. Other symptoms that may appear 1 to 2 days before the rash include:

- Fever.
- Loss of appetite.
- Headache.
- Tiredness and a general feeling of being unwell.

Once the chickenpox rash appears, it goes through three phases:

- Raised bumps called papules, which break out over a few days.
- Small fluid-filled blisters called vesicles, which form in about one day and then break and leak.
- Crusts and scabs, which cover the broken blisters and take a few more days to heal.

New bumps keep showing up for several days. So you may have bumps, blisters and scabs at the same time. You can spread the virus to other people for up to 48 hours before the rash appears. And the virus stays contagious until all broken blisters have crusted over.

The disease is by and large mild in healthy children. But sometimes, the rash can cover the whole body. Blisters may form in the throat and eyes. They also may form in tissue that lines the inside of the urethra, anus and vagina.

### When to see a doctor

If you think you or your child might have chickenpox, call your health care provider. Often, chickenpox can be diagnosed with an exam of the rash and other symptoms. You may need medicines that can help fight off the virus or treat other health problems that can happen because of chickenpox. To avoid infecting others in the waiting room, call ahead for an appointment. Mention that you think you or your child may have chickenpox.

Also, let your provider know if:

- The rash spreads to one or both eyes.

- The rash gets very warm or tender. This might be a sign that the skin is infected with bacteria.
- You have more serious symptoms along with the rash. Watch for dizziness, new confusion, fast heartbeat, shortness of breath, shakiness, loss of the ability to use muscles together, a cough that becomes worse, vomiting, stiff neck or a fever higher than 102 F (38.9 C).
- You live with people who've never had chickenpox and haven't gotten the chickenpox vaccine yet.
- Someone in your household is pregnant.
- You live with someone who has a disease or takes medicines that affect the immune system.

Request an appointment



## Causes

A virus called varicella-zoster causes chickenpox. It can spread through direct contact with the rash. It also can spread when a person with chickenpox coughs or sneezes and you breathe in the air droplets.

# Risk factors

Your risk of getting infected with the virus that causes chickenpox is higher if you haven't already had chickenpox or if you haven't had the chickenpox vaccine. It's extra important for people who work in child care or school settings to be vaccinated.

Most people who have had chickenpox or have gotten the vaccine are immune to chickenpox. If you've been vaccinated and still get chickenpox, symptoms are often milder. You may have fewer blisters and mild or no fever. A few people can get chickenpox more than once, but this is rare.

# Complications

Chickenpox is often a mild disease. But it can be serious and can lead to other health problem including:

- Infected skin, soft tissues, bones, joints or bloodstream caused by bacteria.
- Dehydration, when the body runs too low on water and other fluids.
- Pneumonia, an illness in one or both lungs.
- Swelling of the brain called encephalitis.
- Toxic shock syndrome, a dangerous complication of some illnesses caused by bacteria.
- Reye's syndrome, a disease that causes swelling in the brain and liver. This can happen in children and teens who take aspirin during chickenpox.

In very rare cases, chickenpox could lead to death.

## Who's at risk?

People who are at higher risk of chickenpox complications include:

- Newborns and infants whose mothers never had chickenpox or the vaccine. This includes children under age 1, who have not yet had the vaccine.
- Teens and adults.
- Pregnant women who haven't had chickenpox.
- People who smoke.
- People with cancer or HIV who are taking medication that has an effect on the immune system.
- People with a chronic condition, such as asthma, who take medicine that calms immune response. Or those who have had an organ transplant and take medicine to limit the immune system's action.

## Chickenpox and pregnancy

Low birth weight and limb problems are more common in babies born to women who are infected with chickenpox early in their pregnancies. When a pregnant person catches chickenpox in the week before birth or within a couple of days after giving birth, the baby has a higher risk of getting a life-threatening infection.

If you're pregnant and not immune to chickenpox, talk to your health care provider about these risks.

### Chickenpox and shingles

If you've had chickenpox, you're at risk of a complication called shingles. The varicella-zoster virus stays in your nerve cells after the chickenpox rash goes away. Many years later, the virus can turn back on and cause shingles, a painful cluster of blisters. The virus is more likely to come back in older adults and people who have weaker immune systems.

The pain of shingles can last long after the blisters go away, and it can be serious. This is called postherpetic neuralgia.

In the United States, the Centers for Disease Control and Prevention (CDC) suggests you get the shingles vaccine, Shingrix, if you're 50 or older. The agency also suggests Shingrix if you're 19 or older and you have a weaker immune system because of diseases or treatments. Shingrix is recommended even if you've already had shingles or you've gotten the older shingles vaccine, Zostavax.

Other shingles vaccines are offered outside of the United States. Talk to your provider for more information on how well they prevent shingles.

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# Prevention

The chickenpox vaccine, also called the varicella vaccine, is the best way to prevent chickenpox. In the United States, experts from the CDC report that two doses of the vaccine prevent illness over 90% of the time. Even if you get chickenpox after receiving the vaccine, your symptoms may be much milder.

In the United States, two chickenpox vaccines are licensed for use: Varivax contains only the chickenpox vaccine. It can be used in the United States to vaccinate people age 1 or older. ProQuad combines the chickenpox vaccine with the measles, mumps and rubella vaccine. It can be used in the United States for children ages 1 to 12. This is also called the MMRV vaccine.

In the United States, children receive two doses of the varicella vaccine: the first between ages 12 and 15 months and the second between ages 4 and 6 years. This is part of the routine vaccination schedule for children.

For some children between the ages of 12 and 23 months, the MMRV combination vaccine may raise the risk of fever and seizure from the vaccine. Ask your child's health care provider about the pros and cons of using the combined vaccines.

Children 7 to 12 years old who haven't been vaccinated should receive two doses of the varicella vaccine. The doses should be given at least three months apart.

People age 13 or older who haven't been vaccinated should receive two catch-up doses of the vaccine at least four weeks apart. It's even more important to get the vaccine if you have a higher risk of getting exposed to chickenpox. This includes health care workers, teachers, child-care employees, international travelers, military personnel, adults who live with young children and all nonpregnant women of childbearing age.

If you don't remember whether you've had chickenpox or the vaccine, your provider can give you a blood test to find out.

Other chickenpox vaccines are offered outside the United States. Talk to your health care provider for more information on how well they prevent chickenpox.

Do not get the chickenpox vaccine if you're pregnant. If you decide to get vaccinated before pregnancy, don't try to get pregnant during the series of shots or for one month after the last dose of the vaccine.

Other people also shouldn't get the vaccine, or they should wait. Check with your health care provider about whether you should get the vaccine if you:

- Have a weaker immune system. This includes people who have HIV or take medicines that have an effect on the immune system.
- Are allergic to gelatin or the antibiotic neomycin.
- Have any kind of cancer or are getting cancer treatment with radiation or medicines.
- Recently received blood from a donor or other blood products.

Talk to your provider if you're not sure whether you need the vaccine. If you plan on getting pregnant, ask your provider if you're up to date on your vaccines.

### Is it safe and effective?

Parents often wonder whether vaccines are safe. Since the chickenpox vaccine became available, studies have found that it's safe and it works well. Side effects are often mild. They include pain, redness, soreness and swelling at the site of the shot. Rarely, you might get a rash at the site or a fever.

## Diagnosis

Most often, health care providers find out you have chickenpox based on the rash.

Chickenpox also can be confirmed with lab tests, including blood tests or a tissue study of samples of affected skin.

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## Treatment

In otherwise healthy children, chickenpox often needs no medical treatment. Some children may be able to take a type of medicine called an antihistamine to calm itching. But for the most part, the disease just needs to run its course.

### If you're at high risk of complications

For people who are at high risk of complications from chickenpox, providers sometimes prescribe medicines to shorten the length of the illness and to help lower the risk of complications.

If you or your child is at high risk of complications, your provider may suggest antiviral medicine to fight the virus, such as acyclovir (Zovirax, Sitavig). This medicine may lessen the symptoms of chickenpox. But they work best when given within 24 hours after the rash first appears.

Other antiviral drugs, such as valacyclovir (Valtrex) and famciclovir, also might make the illness less severe. But these may not be approved or right for everyone. In some cases, your provider may suggest that you get the chickenpox vaccine after you've been exposed to the virus. This can prevent the disease or help make it less severe.

### Treating complications

If you or your child gets complications, your provider will figure out the right treatment. For example, antibiotics can treat infected skin and pneumonia. Brain swelling, also called encephalitis, is often treated with antiviral medicine. Treatment in the hospital may be needed.

# Lifestyle and home remedies

To help ease the symptoms of mild chickenpox, you can follow these self-care tips.

## Try not to scratch

Scratching the skin can cause scarring and slow healing. It also can raise the risk that the sores will get infected. If your child can't stop scratching, trim your child's fingernails. It also may help to put gloves on a child's hands, especially at night.

## Relieve the itch and other symptoms

The chickenpox rash can be very itchy, and broken blisters called vesicles sometimes sting. For relief of these and other symptoms, you can try:

- A cool bath with added baking soda, aluminum acetate or uncooked oatmeal. Or you could add colloidal oatmeal, a finely ground oatmeal that is made for soaking.
- Calamine lotion dabbed on the itchy spots.
- A soft, bland diet if chickenpox sores form in the mouth.
- Antihistamines such as diphenhydramine (Benadryl) for itching. But ask your provider if your child can safely take antihistamines.
- Acetaminophen (Tylenol) for a mild fever.

Call your provider if a fever lasts longer than four days and is higher than 102 F (38.9 C). And don't give aspirin to children and teenagers who have chickenpox. This can lead to a serious medical problem called Reye's syndrome.

Talk with your provider before you give any type of nonsteroidal anti-inflammatory drug (NSAID), such as ibuprofen (Advil, Motrin IB, others), to someone who has chickenpox. Some studies suggest this type of medicine may lead to skin infections or tissue damage.

# Preparing for your appointment

Call your family health care provider if you or your child has symptoms of chickenpox. Here's some information to help you get ready for your appointment.

## Information to gather in advance

- **Pre-appointment safety measures.** Ask if you or your child should follow any restrictions before the checkup, such as staying away from other people.
- **Symptom history.** Write down any symptoms you or your child has had, and for how long.
- **Recent exposure to people who might have had chickenpox.** Try to remember if you or your child has been exposed to anyone who might have had the disease in the last few weeks.
- **Key medical information.** Include any other health problems and the names of any medicines you or your child is taking.
- **Questions to ask your provider.** Write down your questions so you can make the most of your time at the checkup.

Questions to ask your provider about chickenpox include:

- What is the most likely cause of these symptoms?
- Are there any other possible causes?
- What treatment do you suggest?
- How soon before the symptoms get better?
- Are there home remedies or self-care steps that could help relieve the symptoms?
- Am I or is my child contagious? For how long?
- How do we lower the risk of infecting others?

Feel free to ask any other questions.

## What to expect from your doctor

Your provider may ask:

- What symptoms have you noticed, and when did they first appear?
- Do you know anyone who has had symptoms of chickenpox within the last few weeks?
- Have you had or has your child had a chickenpox vaccine? How many doses?
- Are you or is your child being treated? Or have you recently been treated for other medical problems?
- Do you or your child take any medicines, vitamins or supplements?
- Is your child in school or child care?
- Are you pregnant or breastfeeding?

## What you can do in the meantime

Rest as much as possible. Try not to touch skin with chickenpox on it. And think about wearing a face mask over the nose and mouth in public. Chickenpox is highly contagious until skin blisters have fully crusted.