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# Mumps: Questions and Answers

## *Information about the disease and vaccines*

### **What causes mumps?**

Mumps is caused by a virus.

### **How does mumps spread?**

Mumps spreads from person to person via droplets of saliva or mucus from the mouth, nose, or throat of an infected person, usually when the person coughs, sneezes, or talks. The virus may also be spread indirectly when someone with mumps touches items or surfaces without washing their hands and then someone else touches the same surface and rubs their mouth or nose. Mumps is less contagious than measles or chickenpox.

### **How long does it take to show signs of mumps after being exposed?**

The incubation period of mumps is usually 16–18 days, but can range from 12–25 days.

### **What are the symptoms of mumps?**

Individuals with mumps usually first feel sick with nonspecific symptoms like headache, loss of appetite, and low-grade fever.

The most well-known sign of mumps is "parotitis," the swelling of the salivary glands, or parotid glands, below the ear. Parotitis occurs only in 30%–40% of individuals infected with mumps. Some people with mumps have no signs or symptoms of illness; others may have respiratory symptoms or only nonspecific symptoms such as headache, loss of appetite, and low-grade fever.

### **How serious is mumps?**

In children, mumps is usually a mild disease. Adults may have more serious disease and more complications.

### **What are possible complications from mumps?**

Central nervous system involvement (meningitis) is common, but is usually not serious. Meningitis (with headache, stiff neck) occurs in up to 15% of people with mumps, but usually resolves without any permanent damage. Up to 50% of postpubertal males experience orchitis (testicular inflammation) as a complication of mumps. This may involve pain, swelling, nausea, vomiting, and fever, with tenderness of the area possibly lasting for weeks. Approximately half of patients with orchitis have some degree of testicular atrophy, but sterility is rare.

Inflammation of the ovaries (oophoritis) and/or

breasts (mastitis) can occur in females who have reached puberty. An increase in spontaneous abortion (miscarriage) has been found among women who developed mumps during the first trimester of pregnancy in some studies but not in others; however, there is no evidence that mumps causes birth defects. Deafness, in one or both ears, can occur in approximately one per 20,000 reported cases of mumps.

### **Is there a treatment for mumps?**

There is no "cure" for mumps, only supportive treatment (bed rest, fluids, and fever reduction).

### **How is mumps diagnosed?**

Mumps is diagnosed by a combination of symptoms and physical signs and laboratory confirmation of the virus, as not all cases develop characteristic parotitis and not all cases of parotitis are caused by mumps.

### **How long is a person with mumps contagious?**

People with mumps are usually considered most infectious from a few days before until 5 days after the onset of parotitis. Therefore, CDC recommends isolating mumps patients for 5 days after their glands begin to swell.

### **What should be done if someone is exposed to mumps?**

If the exposed person has not been vaccinated against mumps, receiving the vaccine after exposure to the virus will not help prevent disease if the child has already been infected. However, if they did not become infected after this particular exposure, the vaccine may help protect him or her against future exposure to mumps.

### **How common is mumps in the United States?**

Due to good immunization coverage, mumps is now rare in the United States. An estimated 212,000 cases occurred in 1964, while only 454 cases were reported in 2008. Large outbreaks of mumps occurred in the United States in 2006 and 2009–10 with more than 6,000 and 3,000 cases, respectively, reported in those years.

### **Can someone get mumps more than once?**

People who have had mumps are usually protected for life against another mumps infection. However, second occurrences of mumps do rarely occur.

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**When did vaccines for measles, mumps, and rubella become available?**

The first measles vaccines (an inactivated and a live virus product) became available in 1963, both of which were largely replaced by a further attenuated live virus vaccine that was licensed in 1968. The mumps vaccine first became available in 1967, followed by the rubella vaccine in 1969. These three vaccines were combined in 1971 to form the measles-mumps-rubella (MMR) vaccine. A single antigen mumps vaccine was available until 1975. A vaccine that combines both MMR and varicella (chickenpox) vaccines, known as MMRV, became available in 2005. Single antigen measles, mumps, and rubella vaccines are no longer available in the U.S.

**What kind of vaccine is it?**

The MMR vaccine is made by using live, attenuated (or weakened) strains of the measles, mumps, and rubella viruses.

**How is this vaccine given?**

This vaccine is a shot given subcutaneously (in the fatty layer of tissue under the skin).

**Who should get this vaccine?**

All children, adolescents, and adults born in 1957 or later without a valid contraindication should have documentation of vaccination or other evidence of immunity. Additionally, some healthcare workers who were born before 1957 may also need proof of vaccination or other evidence of immunity.

**What kind of “evidence of immunity” can substitute for MMR vaccination?**

Evidence of immunity can be shown by having laboratory evidence of immunity to measles, mumps, and/or rubella or, for measles and mumps only, having documentation of disease that was diagnosed by a physician. However, if a person doesn't have evidence of immunity to all three diseases (e.g., measles, mumps, and rubella), they would still need to get vaccinated with MMR since the vaccine is not available as a single antigen product in the U.S.

**At what age should the first dose of MMR be given?**

The first dose of MMR should be given on or after the child's first birthday; the recommended age range is from 12–15 months. A dose given before 12 months of age will not be counted, so the child's medical appointment should be scheduled with this in mind.

**When should children get the second MMR shot?**

The second dose is usually given when the child is 4–6 years old, or before he or she enters kindergar-

ten or first grade. However, the second dose can be given earlier as long as there has been an interval of at least 28 days since the first dose.

**How effective is this vaccine?**

The first dose of MMR vaccine produces good immunity to measles (95–98%), mumps (97%), and rubella (95%). The second dose of MMR is intended to produce immunity in those who did not respond to the first dose, but a very small percentage of people may not be protected even after a second dose.

**Which adolescents and adults should receive the MMR vaccine?**

All unvaccinated adolescents without a valid contraindication to the vaccine should have documentation of two doses of MMR. All adults born in or after 1957 should also have documentation of vaccination or other evidence of immunity.

Adults born before 1957 are likely to have had measles and/or mumps disease as a child and are generally (but not always) considered not to need vaccination. However, facilities should consider vaccinating healthcare workers born before 1957 who lack laboratory evidence (e.g., blood test) of measles, mumps, and rubella immunity or laboratory confirmation of previous disease with MMR vaccine. These facilities should vaccinate healthcare workers with MMR during an outbreak of any of the diseases, regardless of birth date.

**Which adults need two doses of MMR vaccine?**

Certain adults are at higher risk of exposure to measles, mumps, and/or rubella and may need a second dose of MMR unless they have other evidence of immunity; this includes adults who are:

- students in postsecondary educational institutions (for measles and mumps)
- healthcare workers (for measles and mumps)
- living in a community experiencing an outbreak or recently exposed to the disease (for measles and mumps)
- planning to travel internationally (for measles)

**Why do healthcare workers need vaccination or other evidence of immunity to measles, mumps, and rubella?**

People who work in medical facilities are at much higher risk for being exposed to disease than is the general population. Making sure that all workers are immune to these diseases protects both the employee and the patients with whom he or she may have contact. All people working in a healthcare facility in any capacity should have documentation of vac-

ination or evidence of immunity, including full- or part-time employees, medical or non-medical, paid or volunteer, students, and those with or without direct patient responsibilities.

#### **Who recommends this vaccine?**

The Centers for Disease Control and Prevention (CDC), the American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP), the American College of Obstetricians and Gynecologists, and the American College of Physicians (ACP) have all recommended this vaccine.

#### **How safe is this vaccine?**

Hundreds of millions of doses of measles, mumps, and rubella vaccine prepared either as separate vaccines or as the combined MMR have been given in the United States, and its safety record is excellent.

#### **What side effects have been reported with this vaccine?**

Fever is the most common side effect, occurring in 5%–15% of vaccine recipients. About 5% of people develop a mild rash. When they occur, fever and rash usually appear 7–12 days after vaccination. About 25% of adult women receiving MMR vaccine develop temporary joint pain, a symptom related to the rubella component of the combined vaccine. Joint pain only occurs in women who are not immune to rubella at the time of vaccination. MMR vaccine may cause thrombocytopenia (low platelet count) at the rate of about 1 case per 30,000–40,000 vaccinated people. Cases are almost always temporary and benign. More severe reactions, including allergic reactions, are rare. Other severe problems (e.g., deafness, permanent brain damage) occur so rarely that experts cannot be sure whether they are caused by the vaccine or not.

#### **If a child develops a rash after getting the MMR vaccine, is he contagious?**

Transmission of the vaccine viruses does not occur from a vaccinated person, including those who develop a rash. No special precautions (e.g., exclusion from school or work) need be taken.

#### **Who should NOT receive MMR vaccine?**

Anyone who had a severe allergic reaction (e.g., generalized hives, swelling of the lips, tongue, or throat, difficulty breathing) following the first dose of MMR should not receive a second dose. Anyone knowing they are allergic to an MMR component (e.g., gelatin, neomycin) should not receive this vaccine.

As with all live virus vaccines, women known to be pregnant should not receive the MMR vaccine, and

pregnancy should be avoided for four weeks following vaccination with MMR. Children and other household contacts of pregnant women should be vaccinated according to the recommended schedule. Women who are breast-feeding can be vaccinated.

Severely immunocompromised people should not be given MMR vaccine. This includes people with conditions such as congenital immunodeficiency, AIDS, leukemia, lymphoma, generalized malignancy, and those receiving treatment for cancer with drugs, radiation, or large doses of corticosteroids. Household contacts of immunocompromised people should be vaccinated according to the recommended schedule.

Although people with AIDS or HIV infection with signs of serious immunosuppression should not be given MMR, people with HIV infection without symptoms can and should be vaccinated against measles.

#### **Can individuals with egg allergy receive MMR vaccine?**

In the past it was believed that people who were allergic to eggs would be at risk of an allergic reaction from the vaccine because the vaccine is grown in tissue from chick embryos. However, recent studies have shown that this is not the case. Therefore, MMR may be given to egg-allergic individuals without prior testing or use of special precautions.

#### **Does the MMR vaccine cause autism?**

There is no scientific evidence that measles, MMR, or any other vaccine causes autism. The question about a possible link between MMR vaccine and autism has been extensively reviewed by independent groups of experts in the U.S. including the National Academy of Sciences' Institute of Medicine. These reviews have concluded that the available epidemiologic evidence does not support a causal link between MMR vaccine and autism.

The suggestion that MMR vaccine might lead to autism had its origins in research by Andrew Wakefield, a gastroenterologist, in the United Kingdom. In 1998, Wakefield and colleagues published an article in *The Lancet* claiming that the measles vaccine virus in MMR caused inflammatory bowel disease, allowing harmful proteins to enter the bloodstream and damage the brain. The validity of this finding was later called into question when it could not be reproduced by other researchers. In addition, the findings were further discredited when an investigation found that Wakefield did not disclose he was being funded for his research by lawyers seeking evidence to use against vaccine manufacturers. Wakefield was permanently barred from practicing medicine in the

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U.K. and *The Lancet* retracted the original article in 2010.

For a summary of the issues on this topic, please read “Vaccines and Autism,” by Paul A. Offit, MD, Director, Vaccine Education Center, Children’s Hospital of Philadelphia. This discussion can be accessed online at [www.chop.edu/service/vaccine-education-center/hot-topics/autism.html](http://www.chop.edu/service/vaccine-education-center/hot-topics/autism.html)

“MMR vaccine does not cause autism. Examine the evidence!” lists all the major studies related to this issue with links to journal article abstracts: [www.immunize.org/catg.d/p4026.pdf](http://www.immunize.org/catg.d/p4026.pdf)

Dr. Ari Brown has written a good piece for parents questioning the safety of vaccines. To access “Clear Answers & Smart Advice about Your Baby’s Shots,” go to: [www.immunize.org/catg.d/p2068.pdf](http://www.immunize.org/catg.d/p2068.pdf)

For more information, visit CDC’s web page about MMR vaccine safety at [www.cdc.gov/vaccinesafety/Vaccines/MMR/index.html](http://www.cdc.gov/vaccinesafety/Vaccines/MMR/index.html)

**Can the live virus in the vaccine cause measles, mumps, and/or rubella?**

Because the measles, mumps, and rubella viruses in the MMR vaccine are weak versions of the disease viruses, they may cause a very mild case of the disease they were designed to prevent; however, it is usually much milder than the natural disease and is referred to as an adverse reaction to the vaccine.

**What if a pregnant woman inadvertently got the MMR vaccine?**

Women are advised not to receive any live virus vaccine during pregnancy as a safety precaution based on the theoretical possibility of a live vaccine causing disease (e.g., rubella virus leading to congenital rubella syndrome [CRS]).

Because a number of women have inadvertently received this vaccine while pregnant or soon before conception, the Centers for Disease Control and Prevention has collected data about the outcomes of their births. From 1971–1989, no evidence of CRS occurred in the 324 infants born to 321 women who received rubella vaccine while pregnant and continued pregnancy to term. As any risk to the fetus from rubella vaccine appears to be extremely low or zero, individual counseling of women in this situation is recommended, rather than routine termination of pregnancy.