Measles Vaccination Program
Question and Answers

Prepared by

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Last Updated: 15 Feb 06

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Questions and Answers

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Adapted from the Immunization Action Coalition (with permission) and the Centers for Disease Control and Prevention (CDC).

The Disease

Overview

1) What causes measles?
Measles is caused by a virus and is best known by its typical skin rash although it is primarily a respiratory infection. Measles used to be called rubeola, but this term should not be used, to avoid confusion with a different disease that sounds similar: rubella.

2) How do I know if I have measles?
Measles usually begins with a fever that lasts for a few days followed by a cough, runny nose, and “pink eye” (conjunctivitis). A characteristic rash inside the mouth (called Koplik spots) may be seen. A rash starts on the face and upper neck, spreads down the back and trunk, then extends to the arms, hands, legs, and feet. After about five days the rash fades in the same order it appeared. As the rash disappears, the healing skin may look brown temporarily, before it sheds in a finely textured peel.

3) How serious is measles, especially to the Armed Forces?
Measles is unpleasant and its complications can be very serious. About one out of a thousand people infected with measles will develop acute encephalitis, an inflammation of the brain. This serious complication can lead to permanent brain damage. Measles during pregnancy increases the risk of premature labor, miscarriage, and low-birth-weight infants. Birth defects have not been linked to measles exposure. Measles can be especially severe in people with compromised immune systems. Six to 20 percent of people with measles will also develop an ear infection, diarrhea, or pneumonia. Complications from measles are more common among very young children (younger than five years old) and adults older than 20 years of age. For every thousand people infected with measles, 1 to 2 die.

4) Is there a treatment for measles?
There is no specific treatment for measles. People with measles need bed rest, fluids, and control of fever. Patients with complications may need treatment specific to their problem.

Rate and Spread

1) How common is measles in the United States?
Before a vaccine was licensed in1963, there were an estimated 3 to 4 million cases of measles each year. In the years following 1963, the number of measles cases dropped dramatically, with only 1,497 cases in 1983, the lowest annual total reported up to that time.

From 1989 to 1991, 55,622 cases were reported with a total of 123 measles-associated deaths. Half of the cases and deaths were in young children. The most important cause of this epidemic was low immunization rates among preschool-age children. Due to increased immunization efforts after this epidemic, measles cases fell during the 1990s. Only 44 cases were reported in 2002. However, measles is still common in many other countries in the world and can easily be imported, so continued immunization against the disease is still important.

2) How does measles spread from one person to another?
Measles is highly contagious. Infected people are usually contagious from about 4 days before their rash starts and for up to 4 days afterwards. The measles virus resides in the mucus in the nose and

throat of infected people. When they sneeze or cough, droplets spray into the air and the droplets remain active and contagious on infected surfaces for up to 2 hours.

3) How long is someone with measles contagious?
Measles is highly contagious and can be transmitted from 4 days before the rash becomes visible to 4 days after the rash appears.

4) Can you get measles more than once?
No.

5) If I think someone has been exposed to measles, what should I do?
Refer anyone exposed to measles to their doctor immediately. If a child has not been vaccinated, measles vaccine may prevent illness if given within 72 hours of exposure. Immune globulin (a blood product containing antibodies to the measles virus) may prevent or lessen the severity of measles if given within 6 days of exposure.

The Vaccine

Immunization

1) What kind of vaccine is given to prevent measles?
Most people receive measles vaccine as part of a combination vaccine known as M-M-R II® which also protects against two other viruses – mumps and rubella. Another option is a vaccine called Proquad® which provides protection against measles, mumps, rubella and varicella (chicken pox) in one shot. A vaccine protective against measles only is also available and called Attenuvax®. All three of these vaccines are produced by Merck and Co, Whitehouse Station, NJ.

Measles vaccines are live, attenuated (weakened) virus vaccines. This means that after injection, the virus grows, and causes a harmless infection in the person immunized. The body's immune system fights the infection caused by the weakened virus, which results in the person becoming immune to measles infection.

2) Who should get this vaccine?
Two doses of measles vaccine (given as combination MMR) are recommended for all children and adolescents and certain adults.

3) Why do health care workers need proof of immunity to measles?
People who work in medical facilities are at much higher risk for acquiring and transmitting measles than the general population is. Making sure that all health care workers are immune to this disease protects both the employee and the patients with whom he or she may have contact. All people working in a health care facility should have evidence of immunity to measles, including full- or part-time employees, medical or non-medical, paid or volunteer, students, and those with or without direct patient responsibilities. Health care workers should have one of the following: two doses of MMR vaccine, a laboratory test that indicates immunity, or written evidence of previous measles disease diagnosed by a physician.

4) How safe is this vaccine?
Hundreds of millions of doses of measles vaccine have been given in the United States, and its safety record is excellent. Because it is a live vaccine, side effects following vaccination can be similar to a very mild case of measles. More than 80% of children will have no side effects at all.

5) 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 appear 7-10 days after vaccination. About 25% of adult women receiving MMR vaccine develop temporary joint pain, although this symptom is related to the rubella component of the combined vaccine. Joint pain only occurs in women who are susceptible to rubella at the time of vaccination.

More severe reactions, including allergic reactions, are rare. About one person per million develops inflammation of the brain due to the measles component of the MMR vaccine.

6) If someone develops a rash after getting the MMR vaccine, is he or she contagious?
Transmission of the measles vaccine virus does not occur from a vaccinated person, including those who develop a rash. No special precautions (e.g., staying home from school or work) need to be taken.

7) Does the MMR vaccine cause autism?
Current scientific evidence does not support the hypothesis that measles-mumps-rubella (MMR) 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 MMR-autism theory had its origins in research by Andrew Wakefield and colleagues in England. Those colleagues have retracted their article about the theory. Studies that suggest a cause-and-effect relationship between MMR vaccine and autism have received a lot of attention by the media. However, these studies have significant weaknesses and are far outweighed by many population studies that have consistently failed to show a causal relationship between MMR vaccine and autism. For a summary of the issues surrounding this topic, please read "Vaccines and Autism," by Paul A. Offit, MD, Director, Vaccine Education Center, Children's Hospital of Philadelphia. This article can be accessed online at: www.immunize.org/catg.d/p2065.htm. For more information and links to related journal articles, visit IAC's "Autism" page at: www.immunize.org/safety/autism.htm

8) How effective is this vaccine?
The first dose of MMR vaccine produces immunity to measles in 95% to 98% of children vaccinated. The reason for the second dose is to protect those people who did not become immune after one dose. After two doses of measles vaccine, 99% of people become immune to the disease.

9) Can the vaccine cause measles?
As mentioned above, because the measles vaccine is "live," it can cause mild measles-like symptoms in some recipients, but it does not cause measles.

Administration

1) At what age should the first MMR shot be given?
The first dose of M-M-R II® should be given on or after the first birthday; the recommended range is from 12 to 15 months. A dose given before 12 months of age—even one day early—may not be counted as a valid dose, so the child's medical appointment should be scheduled with this in mind.

2) When should children get the second MMR shot?
The second dose, at least 28 days after the first dose, is usually given when the child is 4-6 years of age or before he or she enters kindergarten or first grade. The second dose can be given anytime as long as it is at least four weeks after the first dose. There is a catch up opportunity at 11 to 18 years of

age for the second dose.

3) How is this vaccine given?
This vaccine is a 0.5-mL dose shot given subcutaneously (in the fatty layer of tissue under the skin). Give children the first dose at 12 to 15 months of age and the second dose at 4 to 6 years of age. Give MMR to children who have not received the second dose by their 11- to 12-year-old visit. There should always be at least 4 weeks between the first and second dose.

ProQuad®, the quadruple vaccine, is indicated for children 12 months to 12 years of age if a second dose of measles, mumps, and rubella vaccine is to be administered.

Adults born before 1957 are assumed to be immune to measles by natural infection. Give adults born in 1957 or later, who do not have medical restrictions, at least one dose of MMR vaccine during their lifetime. Give two lifetime doses of MMR vaccine to certain adults born in 1957 or later including healthcare workers, those who travel overseas, or those who attend college, or post-secondary educational institutions. These adults should receive two doses of MMR or have other evidence of measles immunity (lab test or physician-diagnosed measles).

A second dose of MMR is also recommended for adults who have been recently exposed to measles or who are in an outbreak setting, were previously vaccinated with killed measles vaccine, were vaccinated with an unspecified measles vaccine between 1963 and 1967, or plan to travel internationally.

M-M-R II® is administered to military basic trainees, unless they have positive blood tests or documented evidence of two prior vaccinations. For other adults and children, DoD follows guidelines of the Advisory Committee on Immunization Practices (ACIP). In general, ACIP prefers use of M-M-R II® to monovalent (Attenuvax®) or bivalent vaccines, to optimize immunity to all three diseases.

Contraindications

1) Who should NOT receive measles vaccine?
The following people should not receive MMR vaccine:

- People who had a severe allergic reaction to the vaccine or one of its components (e.g., generalized hives, swelling of the lips, tongue, or throat, difficulty breathing).
- Anyone who experiences a severe allergic reaction before or after the first dose of MMR should not receive a second dose.
- Pregnant women or women who are considering pregnancy within the next month.
- People who are immune suppressed.
- People with moderate to severe acute illnesses.

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.

Some of these serious allergic reactions may be related to a severe allergy to gelatin. If you or a family member has a severe allergy to gelatin, tell your health care worker.

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.

2) What about pregnant or breastfeeding women?
Women who are breast-feeding can be vaccinated. Children and other household contacts of pregnant women should be vaccinated according to the recommended schedule.