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AAP News

What are the indications, precautions, contraindications for MMR vaccination?

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Editor's note: *This is the second of three articles on the safety of measles vaccine. The first article "When should measles vaccine be given? What is interval between doses?" can be found at*https://www.aappublications.org/news/2019/04/19/measles041919.

Following licensure of the first measles vaccines in 1963, measles cases declined dramatically. Small numbers of cases continued to occur in the 1970s and 1980s. Then, more than 55,000 cases of measles were reported in the U.S. from 1989 through 1990, resulting in 123 measles-associated deaths.

Disease occurred primarily in two groups: unvaccinated children in the first five years of life and individuals who were vaccinated appropriately at or after 12 months of age (only one dose of measles vaccine was recommended until 1989) but experienced an inadequate immune response and remained susceptible (primary vaccine failure).

To combat this increase in cases, routine administration of two doses of measles, mumps, rubella (MMR) vaccine was recommended in 1989 (MMR was licensed in 1971), with both doses administered after the first 12 months of life. Subsequently, the number of reported measles cases declined, and the U.S. was declared free of measles in 2000.

But measles again is making a resurgence. So far this year, 839 cases have been reported, the highest number since 1994, according to the Centers for Disease Control and Prevention.

Measles virus generally is introduced into a community by U.S. residents returning from or people visiting from countries where measles outbreaks are occurring, such as Israel, Ukraine and the Philippines. Yearly variation in the number of reported cases in the U.S. depends on the number of travelers who contract measles abroad and return to the U.S. Once introduced, the extent of spread of the virus depends on the number of undervaccinated children and adults exposed to an infectious case.

Which of the following statements are false?

a) Adequate vaccination for measles, mumps and rubella for health care personnel born during or after 1957 (62 years of age or younger) consists of two doses of MMR.

b) Breastfeeding is a contraindication to MMR vaccination of either the woman or the breastfeeding child.

c) MMR may be administered to egg-allergic children without prior routine skin testing.

d) MMR should not be administered to anyone with a penicillin or cephalosporin allergy.

e) Receipt of antibody-containing blood products (e.g., immune globulin, whole blood or packed red blood cells, intravenous immune globulin) may interfere with seroconversion after measles vaccine administration.

Answer: b and d are false

Adults born in 1957 or later who do not have a medical contraindication should receive at least one dose of MMR vaccine unless they have documentation of vaccination or other acceptable evidence of immunity to these three diseases. Serologic studies have demonstrated that it can be assumed that people born before 1957 had measles and are immune. Health care providers born during or after 1957 should have documentation of two

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doses of MMR or other evidence of immunity.

Contraindications for MMR vaccination include history of a severe (anaphylactic) reaction to a previous dose or to any component of the vaccine (such as gelatin or neomycin), pregnancy and immunosuppression.

The attenuated vaccine strain of measles is propagated in chick embryo cell culture and is grown in a buffered salt solution (Medium 199) plus sucrose, phosphate, glutamate, neomycin and recombinant human albumin. Sorbitol and hydrolyzed gelatin are added as a stabilizer for rubella virus. MMR vaccine does not contain penicillin. A history of penicillin or cephalosporin allergy is not a contraindication to vaccination with MMR or any other U.S. vaccine.

Women known to be pregnant should not receive measles vaccine, although evidence does not suggest an increased risk of adverse effects among infants born to women who inadvertently receive MMR during pregnancy. Close contact with a pregnant woman is not a contraindication to MMR vaccination of the contact.

Breastfeeding is not a contraindication to vaccination of either the woman or the breastfeeding child. An immunized person does not shed or transmit the attenuated vaccine measles strain.

Replication of attenuated vaccine viruses can be prolonged in people who are immunosuppressed. Patients who are severely immunocompromised should not be given MMR vaccine. Healthy susceptible close contacts of severely immunocompromised people should be vaccinated. Patients with leukemia in remission who have not received chemotherapy for at least three months may receive MMR.

Precautions to MMR administration include acute severe illness, high-dose steroid use, recent receipt of a blood product or a history of thrombocytopenia.

People with moderate or severe acute illness should not be vaccinated until the illness has improved. This precaution is intended to prevent complicating the management of an ill patient with a potential vaccine adverse reaction, such as fever. Minor illness (e.g., otitis media, mild upper respiratory or gastrointestinal infections) or concurrent antibiotic therapy is not a precaution to measles vaccination. Fever alone is not a contraindication.

Unless benefit is felt to outweigh risk, a person receiving daily high-dose corticosteroid therapy (2 or more milligrams/kilogram per day or 20 mg or more per day of prednisone) for 14 days or more should not receive MMR vaccine. MMR administration should be avoided for four weeks after cessation of high-dose therapy. In most cases, people receiving low-dose (less than 2 mg/kg/day) or short-course (less than 14 days) corticosteroid therapy, alternate-day treatment, maintenance physiologic doses, or topical, aerosol, intra-articular, bursal or tendon injections may be vaccinated.

Receipt of antibody-containing blood products (e.g., immune globulin, whole blood or packed red blood cells, intravenous immune globulin) may interfere with seroconversion after measles vaccine administration. Guidance regarding appropriate intervals between administration of a blood product and MMR administration is available on page 40 of the 2018 AAP *Red Book*, http://bit.ly/2L5pjl1).

In the past, people with a history of anaphylactic reactions following egg ingestion were considered to be at increased risk for reactions after receipt of MMR. The risk of a hypersensitivity reaction (anaphylaxis) to egg protein (ovalbumin) now is recognized as extremely rare following MMR administration, and egg allergy is no longer a contraindication. Skin testing with vaccine is not recommended because it does not predict an allergic reaction.

People with a history of thrombocytopenia may be at increased risk for developing thrombocytopenia after MMR vaccination. However, no reports describe hemorrhagic complications due to thrombocytopenia after MMR

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administration. The benefits of immunization usually are greater than the potential risks, and vaccination is justified because of the even greater risk for thrombocytopenia after measles disease.

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