Measles: A continuing saga
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Measles is a highly contagious vaccine-preventable disease that still causes epidemics around the world. Because of the highly contagious nature of this virus, an estimated 400,000 to 500,000 cases were reported annually in the United States before the release of the vaccine in 1963. At that time, it was estimated that up to 3.5 million individuals, equivalent to all the children born each year, were infected. More than 90% of U.S. citizens had been infected by the time they were 15 years old. The measles vaccine has eliminated the occurrence of epidemics in the United States and other regions of the world in which it has been widely adopted. Unfortunately, measles remains common in underdeveloped countries, and the incidence is increasing worldwide.

The measles virus is transmitted via airborne or droplet exposure. The virus incubates for 10 to 12 days, at which time the prodromal phase begins. Symptoms include an increasing fever, cough, coryza, conjunctivitis, and Koplik spots. Koplik spots are blue-white spots that appear on the buccal mucosa and are responsible for the spread of the virus before and after the skin rash develops. At approximately day 4, a maculopapular rash starts to appear. The rash characteristically begins at the hairline and continues down the face and neck before spreading to the extremities. The rash lasts 5 to 6 days before fading in the same sequence that it appeared. Measles can result in severe complications such as pneumonia, otitis media, diarrhea, encephalitis, or death.

According to the Council of State and Territorial Epidemiologists, the illness is defined by a generalized rash lasting greater than 3 days, a temperature above 101°F (38.3°C), and a cough, coryza, or conjunctivitis. Even if this definition is met, laboratory tests are needed for a clinical diagnosis to occur. Laboratory evidence consists of a positive serologic test for the measles immunoglobulin M antibody, a substantial increase in the measles immunoglobulin G antibody, isolation of measles virus from a clinical specimen, or detection of measles virus–specific nucleic acid by polymerase chain reaction. Clinical diagnosis can also be made if all specifications of an illness are met and epidemiologic linkage to a confirmed case of measles is present.

The Advisory Committee on Immunization Practices (ACIP) recommends all children receive two doses of the measles vaccine, available in the United States as a combination containing measles, mumps, and rubella (MMR) vaccines. The first dose is scheduled to be administered between 12 and 15 months of age and the second dose between 4 and 6 years. The second dose of vaccine is not meant to boost the first but to provide immunity for those who did not respond to the initial dose. Approximately 99% of those receiving both doses develop serologic immunity, which is thought to provide lifelong protection. Individuals who lack evidence of immunity should be vaccinated, even if they believe they have received the vaccination previously. Evidence of immunity includes documentation of two doses of the vaccine, laboratory evidence of immunity, birth before 1957, or documentation of physician-diagnosed disease. For instances in which vaccination is occurring outside the schedule, two doses of vaccine should be administered and separated by a minimum of 28 days.

Because MMR is a live virus vaccine, it is contraindicated in patients who are immunosuppressed or have received a blood product.

In 2011, substantial outbreaks occurred in European countries. As of October 26, 2011, 26,074 cases were reported in 36 of the 53 European Region member states. Of these cases, 45% of infected individuals had not been vaccinated and the vaccination status was unknown in 45%. These outbreaks have also affected the United States as a result of importation. According to the Centers for Disease Control & Prevention, 222 cases of measles were reported in the United States in 2011. This is a substantial increase from 2001 to 2008, when a median of 56 (range 37–140) measles cases were reported annually. A total of 166 (75%) of these infected individuals were unvaccinated or had unknown vaccination status, and 32% of these cases resulted in hospitalization. Some of those who contracted measles were too young for immunization. However, 70% of these individuals were not vaccinated because of religious, philosophical, or personal objection. Vaccinations could have prevented a majority of these infections.

Measles outbreaks occur in both vaccinated and unvaccinated individuals. Measles cases in vaccinated individuals have caused speculation about a decrease in the efficacy of the vaccine. A small percentage of individuals receiving two doses of the vaccine never develop immunity. Other infections such as HIV have caused a decrease in the effectiveness of the vaccine and an increase in the transmissibility of measles.

Send your immunization questions to the JAPhA Contributing Editors who coordinate the Vaccine Update column:

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Vaccine Update

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References


