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Multi-State Measles Outbreak Continues to Spread: These Resources Can Help You

The U.S. is experiencing a large multi-state measles outbreak linked to Disneyland (California). Two other unrelated measles outbreaks are also occurring in Illinois and Nevada. From January 1–February 20, the U.S. measles outbreaks have grown to include 154 people in 17 states and Washington, DC, according to the Centers for Disease Control and Prevention (CDC). According to the CDC, the majority of the people who contracted measles were unvaccinated. Please refer to the following information and resources as we all work together to help stop the spread of measles during this multi-state outbreak. In addition, this issue of *Needle Tips* features several "Ask the Experts" Q&As about measles and MMR vaccine (see pages 1, 26–27), as well as two popular handouts that can help you with vaccine-hesitant parents (see pages 22–23).

CDC Guidance for Healthcare Providers (HCP)

- Be vigilant about measles.
- Ensure all patients are up to date on measles-mumps-rubella (MMR) vaccine.
- Suspect measles in patients presenting with febrile rash illness and clinically compatible measles symptoms (cough, coryza, and conjunctivitis).
- Ask patients about their recent travel history, as well as a history of exposure to measles in their community.
- Promptly isolate patients with suspected measles to avoid disease transmission and immediately report the suspect measles case to the health department.
- Obtain specimens for testing from patients with suspected measles, including viral specimens for genotyping, which can help determine the source of the virus; contact your local or state health department with questions about submitting specimens for testing.

Resources About Measles for HCP

- Healthcare provider guidance from CDC: www.cdc.gov/measles/hcp/index.html
- Updates on the U.S. measles cases and outbreak: www.cdc.gov/measles/cases-outbreaks.html
- Ask the Experts: Measles, Mumps, and Rubella: www.immunize.org/askexperts/experts_mmr.asp
- Measles images from IAC's Image Library: www.immunize.org/photos/measles-photos.asp
- Standing Orders for Administering Measles, Mumps & Rubella Vaccine to Children & Teens: www.immunize.org/catg.d/p3079a.pdf

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Ask the Experts

The Immunization Action Coalition extends thanks to our experts, medical officer Andrew T. Kroger, MD, MPH, and nurse educator Donna L. Weaver, RN, MN, both with the National Center for Immunization and Respiratory Diseases at the Centers for Disease Control and Prevention (CDC).

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MMR vaccine

What are the signs and symptoms healthcare providers should look for in diagnosing measles?

Healthcare providers should suspect measles in patients with a febrile rash illness and the clinically compatible symptoms of cough, coryza (runny nose), and/or conjunctivitis (red, watery eyes). A clinical case of measles is defined as an illness characterized by

- a generalized rash lasting 3 or more days, and
- a temperature of 101°F or higher (38.3°C or higher), and
- cough, coryza, and/or conjunctivitis.

Koplik spots, a rash present on mucous membranes, are considered pathognomonic for measles. Koplik spots occur from 1–2 days before the measles rash appears to 1–2 days afterward. They appear as punctate blue-white spots on the bright red background of the buccal mucosa (inside lining of cheek).

Providers should be especially aware of the possibility of measles in people with fever and rash who have recently traveled abroad, who have had contact with international travelers, or who have visited or had contact with someone who has visited an area affected by the current measles outbreak (such as Disneyland in California).

Providers should immediately isolate and report suspected measles cases to their local health department and obtain specimens for measles testing, including viral specimens for confirmation and genotyping. Providers should also collect blood for serologic testing during the first clinical encounter with a person who has suspected or probable measles.

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Immunization questions?

- ▶ Email nipinfo@cdc.gov
- ▶ Call your state health department (phone numbers at www.immunize.org/coordinators)

Andrew T. Kroger, MD, MPH

Donna L. Weaver, RN, MN

IAC's "Ask the Experts" team from the Centers for Disease Control and Prevention

How long does it take to show signs of measles after being exposed?

There is an average of 10–12 days from exposure to a person infected with measles virus to the appearance of the first symptom, which is usually fever. The measles rash doesn't usually appear until approximately 14 days after exposure, 2–4 days after the fever begins.

Has ACIP made any new recommendations for use of MMR vaccine (Merck) because of the current multi-state outbreak of measles?

No. Existing recommendations for use of MMR are still applicable. The most current recommendations were published in June 2013 and are available at www.cdc.gov/mmwr/pdf/rr/rr6204.pdf.

What is the earliest age at which I can give MMR to an infant who will be traveling internationally?

ACIP recommends that children who travel or live abroad should be vaccinated at an earlier age than that recommended for children who reside in the United States. Before their departure from the United States, children age 6 through 11 months should receive 1 dose of MMR. The risk for measles exposure can be high in both developed and developing countries. Consequently, CDC encourages all international travelers to be up to date on their immunizations regardless of their travel destination and to keep a copy of their immunization records with them as they travel. For additional information on the worldwide measles situation, and on CDC's measles vaccination information for travelers, go to wwwnc.cdc.gov/travel.

We have young adult patients in our practice at high risk for measles, including those going back to college, going to Disneyland, or preparing for international travel, who don't remember ever receiving MMR vaccine or having had measles disease. How should we manage these patients?

You have two options. You can test for immunity or you can just give 2 doses of MMR at least 4 weeks apart. There is no harm in giving MMR vaccine to a person who may already be immune to one or more of the vaccine viruses. If you or the patient opt for testing, and the tests indicate the patient is not immune to one or more of the vaccine components, give your patient 2 doses of MMR at least 4 weeks apart. If any test results are indeterminate or equivocal, consider your patient nonimmune. ACIP does not recommend serologic testing after vaccination because commercial tests may not be sensitive enough to reliably detect vaccine-induced immunity.

We have measles cases in our community. How can I best protect the young children in my practice?

First of all, make sure all your patients are fully vaccinated according to the U.S. immunization schedule.

In certain circumstances, such as for international travel, MMR is recommended for infants age 6 through 11 months. During a measles outbreak situation, consult your local or state health department to find out if measles vaccination of infants as young as age 6 months is recommended in your area as a control measure. Do not count any dose of MMR vaccine as part of the 2-dose series if it is administered before a child's first birthday. Instead, repeat the dose when the child is age 12 months.

In the case of a local outbreak, you also might consider vaccinating children age 12 months and older at the minimum age (12 months, instead of 12–15 months) and giving the second dose 4 weeks later (at the minimum interval) instead of waiting until age 4–6 years.

Finally, remember that infants too young for routine vaccination and people with medical conditions that contraindicate measles immunization depend on high MMR vaccination coverage among those around them. Urge all your patients and their family members to get vaccinated if they are not immune.

What are the contraindications and precautions for MMR vaccine?

Contraindications are the following:

- History of a severe (anaphylactic) reaction to neomycin (or other vaccine component) or following previous dose of MMR
- Pregnancy
- Severe immunosuppression from either disease or therapy

Precautions are the following:

- Receipt of an antibody-containing blood product in the previous 11 months
- Moderate or severe acute illness with or without fever
- History of thrombocytopenia or thrombocytopenic purpura

Important details about the contraindications and precautions for MMR vaccine are in the current MMR ACIP statement, available at www.cdc.gov/mmwr/pdf/rr/rr6204.pdf.

I have patients who remember receiving MMR vaccine but have no written record, or whose parents report the patient has been vaccinated. Should I accept this as evidence of vaccination?

No. Self-reported doses and history of vaccination provided by a parent or other caregiver are not considered to be valid. You should only accept a written, dated record as evidence of MMR vaccination.

If you can give the second dose of MMR as early as 28 days after the first dose, why do we routinely wait until kindergarten entry to give the second dose?

The second dose of MMR may be given as early as 4 weeks after the first dose, and be counted as a valid dose if both doses were given after the first birthday. The second dose is not a booster, but rather it is intended to produce immunity in the small number of people who fail to respond to the first dose. The risk of measles is higher in school-age children than those of preschool age, so it is important to receive the second dose by school entry. It is also convenient to give the second dose at this age, since the child will have an immunization visit for other school entry vaccines.

Can I give MMR to a breastfeeding mother?

Yes. Breastfeeding does not interfere with the response to MMR vaccine. Vaccination of a woman who is breastfeeding poses no risk to the infant being breastfed. Although it is believed that rubella vaccine virus, in rare instances, may be transmitted via breast milk, the infection in the infant is asymptomatic.

What is the recommended length of time a woman should wait after receiving MMR vaccine before becoming pregnant?

Although the MMR package insert recommends a 3-month deferral of pregnancy after MMR vaccination, ACIP recommends deferral of pregnancy for four weeks. For details on this issue see ACIP recommendations (*MMWR* 2013; 62[4]: 1–34) at www.cdc.gov/mmwr/pdf/rr/rr6204.pdf.

Can we give an MMR to a 15-month-old whose mother is pregnant?

Yes. Measles, mumps, and rubella vaccine viruses are not transmitted from the vaccinated person,

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Ask the Experts… *continued from page 26*

so MMR vaccination of a household contact does not pose a risk to a pregnant household member.

What is the recommendation for MMR vaccine for healthcare personnel (HCP)?
ACIP recommends that all HCP born during or after 1957 have adequate presumptive evidence of immunity to measles, mumps, and rubella, defined as documentation of two doses of measles and mumps vaccine and at least one dose of rubella vaccine, laboratory evidence of immunity, or laboratory confirmation of disease. ACIP also recommends consideration of MMR vaccination of all unvaccinated HCP who were born before 1957 and who lack laboratory evidence of measles, mumps, and/or rubella immunity or laboratory confirmation of disease.

During an outbreak of measles or mumps, healthcare facilities should recommend 2 doses of MMR separated by at least 4 weeks for unvaccinated HCP, regardless of birth year, who lack laboratory evidence of measles or mumps immunity or laboratory confirmation of disease. During outbreaks of rubella, healthcare facilities should recommend 1 dose of MMR for unvaccinated personnel, regardless of birth year, who lack laboratory evidence of rubella immunity or laboratory confirmation of infection or disease.

Would you consider HCP with 2 documented doses of MMR vaccine to be immune even if their serology for 1 or more of the antigens comes back negative?
Yes. HCP with 2 documented doses of MMR vaccine are considered to be immune regardless of the results of a subsequent serologic test for measles, mumps, or rubella. Documented age-appropriate vaccination supersedes the results of subsequent serologic testing. HCP who do not have documentation of MMR vaccination and whose serologic test is interpreted as "indeterminate" or "equivocal" should be considered not immune and should receive 2 doses of MMR. ACIP does not recommend serologic testing after vaccination.

If a healthcare professional had a positive test for measles antibody more than 10 years ago, is it necessary to retest them now?
No. Once measles immunity is documented, there is no need for further vaccination or testing. "Once immune, always immune" is true for varicella, mumps, and rubella, as well as for measles, regardless of the results of subsequent testing. ACIP does not recommend repeat antibody testing once evidence of immunity (such as appropriate vaccination or IgG seropositivity) has been established.

Can I give MMR to a child whose sibling is receiving chemotherapy for leukemia?
Yes. MMR vaccine should be given to the healthy household contacts of immunosuppressed children.

Is there any evidence that MMR causes autism?
No. This issue has been studied extensively in recent years, including a thorough review by the Institute of Medicine (IOM), an impartial group of the world's leading experts that advises Congress on science issues. After reviewing more than 200 studies in 2004 and more than 1,000 studies in 2011, the consensus report strongly stated that the evidence did not show a link between vaccines and autism. To access the IOM committee minutes, as well as the executive summaries and full reports, visit www.immunize.org/iom.

In 2014, researchers from the RAND Corporation published an update to the 2011 IOM report. In a systematic review of the evidence published on vaccine safety to date, they found the evidence was strong that MMR vaccine is not associated with autism. For more information, see "Evidence Shows Vaccines Unrelated to Autism" at www.immunize.org/catg.d/p4028.pdf and "MMR Vaccine Does Not Cause Autism" at www.immunize.org/catg.d/p4026.pdf.

Pneumococcal vaccines

We have a healthy 78-year-old female patient who received PCV13 (Prevnar13, Pfizer), then received PPSV23 (Pneumovax 23, Merck) approximately 5 weeks later. She had not received PPSV23 previously. Is the PPSV23 dose valid, or does it need to be repeated?
What to do when doses of PCV13 and PPSV23 are given without the recommended minimum interval between them isn't spelled out in the new ACIP pneumococcal recommendations. The CDC subject matter experts have provided the following guidance: in such a case, the dose given second does not need to be repeated. This is an exception to the usual procedure for a minimum interval violation (as described in ACIP's *General Recommendations on Immunization*). For your reference, the recommended interval between the dose of PCV13 and PPSV23 is 6–12 months and the acceptable minimum interval is 8 weeks.

Why is it recommended to give PCV13 before PPSV23 to adults age 65 years and older? Wouldn't PPSV23 protect them against ten additional strains of the pneumococcal virus?
PCV13 is recommended to be given first because of the immune response to the vaccine when given in this sequence. An evaluation of immune response after a second pneumococcal vaccination administered 1 year after an initial dose showed that subjects who received PPSV23 as the initial dose had lower antibody responses after subsequent administration of PCV13 than those who had received PCV13 as the initial dose followed by a dose of PPSV23.

Scheduling vaccines

Two live virus vaccines can be given on the same day. How do you define "day"?
The "same day" generally means at the same visit. This interval has not been precisely defined and probably will never be since it would be extremely difficult to study in order to develop an evidence-based recommendation. Immunization programs (and their computer systems) likely define this differently. It seems reasonable that if two vaccines were given on the same date then they would both be valid.

Combination vaccines

A dose of Kinrix (DTaP-IPV; GlaxoSmithKline) was inadvertently given to a 4-month-old in our practice who needed DTaP and IPV. Can these doses be considered valid?
As you know, Kinrix is only licensed for use as the fifth dose of the DTaP vaccine series and the fourth dose of the IPV series in children aged 4–6 years. CDC has provided this guidance for when Kinrix is given off-label:

- Kinrix given to a child younger than 4 years as DTaP and IPV doses 1, 2, or 3: Count as valid if all minimum intervals met.
- Kinrix given to a child younger than 4 years as DTaP and IPV doses #4 and/or #5: Count as valid for DTaP #4; not valid for DTaP #5 or IPV #4, both of which must be administered at age 4–6 years.

However, you should check with your state immunization manager to see what they will accept. Checking with your state is particularly important for validating a last dose of IPV vaccine administered before the fourth birthday. Their guidance may vary depending on the date of administration or your upcoming travel plans. Contact information can be found here: www.immunize.org/coordinators.

To find more than 1,000 "Ask the Experts" Q&As answered by CDC experts, visit www.immunize.org/askexperts

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