Pink Book Webinar 2019

Measles, Mumps, Rubella

Unanswered Chat Box Questions and Answers

August 14, 2019

1. The disease incidence stats for measles within the last 10 years show thousands of measles incidents but at a death rate below 1 in 1,000. What accounts for the difference in the reported death rate vs. the observed death rate?

There have been three measles-related deaths reported since the year 2000—one death in 2015 and two deaths in 2003.

1. Can titers be used to meet school vaccination requirements or is vaccination required?

ACIP considers laboratory evidence of immunity to be acceptable for all individuals. A patient should have titers demonstrating immunity to all three diseases covered by MMR vaccine.

State, local, and/or school requirements may vary by jurisdiction. If the jurisdiction will not accept titers, then you would need to abide by their policy. We recommend that you check within your jurisdiction to find out what the requirements are and then adhere to those requirements.

1. Is Puerto Rico included in the data (I don’t see it on the measles outbreak map of the US)? Have there been any cases of measles reported in Puerto Rico during the current outbreak?

Puerto Rico is included in the national data shown. However, there were no measles cases reported for the specified time period.

1. The majority of people we come in contact with DON'T have documentation of a dose of MMR (childhood records are hard to find). In that case, would you recommend just asking them to get a dose of MMR or performing serology?

Both are options. You can test for immunity or you can just give MMR vaccine based on the patient’s age and any risk factors. 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 opts for testing, and the tests indicate the patient is not immune to one or more of the vaccine components, administer the appropriate number of MMR vaccine doses (1 or 2) based on age and risk factors. 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.

1. How frequent is MMR-vaccine-related encephalitis reported? The anti-vax community speaks of this often.

According the manufacturer’s package insert, “Encephalitis and encephalopathy have been reported approximately once for every 3 million doses of M-M-R II or measles-, mumps-, and rubella-containing vaccine administered since licensure of these vaccines. The risk of serious neurological disorders following live measles virus vaccine administration remains less than the risk of encephalitis and encephalopathy following infection with wild-type measles (1 per 1000 reported cases).”

This and additional information can be found at https://www.fda.gov/media/75191/download.

1. Can MMR vaccine be administered to pregnant women?

No, MMR should not be administered to pregnant women. ACIP recommends that women of childbearing age be asked if they are pregnant or likely to become pregnant within the next 4 weeks. If the answer is yes, the woman should not be vaccinated until after the pregnancy. Because there is a theoretical risk to the fetus when the mother receives a live-virus vaccine, women should be counseled to avoid becoming pregnant for 4 weeks after receipt of MMR vaccine. The vaccine package insert recommends deferral of pregnancy for 3 months after vaccination, but ACIP’s off-label recommendation is a waiting period of 4 weeks. If the vaccine is inadvertently administered to a pregnant woman or a pregnancy occurs within 28 days of vaccination, the patient should be counseled about the theoretical risk to the fetus. There have been no reports of vaccine-related harm to a fetus because of inadvertent vaccination during pregnancy, so MMR vaccination during pregnancy should not be considered an indication for termination of pregnancy.

1. Can you please review the evidence of measles immunity criteria, including the criteria for health care personnel?

Acceptable presumptive evidence of immunity to measles includes at least one of the following:

• Written documentation of adequate vaccination

◦ 1 or more doses of a measles-containing vaccine administered on or after the first birthday for preschool-age children and adults not at high risk

◦ 2 doses of measles-containing vaccine for school-age children and adults at high risk, including college students, **health care personnel**, and international travelers

• Laboratory evidence of immunity

• Laboratory confirmation of measles

• Birth before 1957

Although birth before 1957 is considered acceptable evidence of measles immunity, health care facilities should consider vaccinating unvaccinated personnel born before 1957 who do not have other evidence of immunity with 2 doses of MMR vaccine (minimum interval of 28 days between doses).

During an outbreak of measles, health care facilities should recommend 2 doses of MMR vaccine at the appropriate interval for unvaccinated health care personnel regardless of birth year if they lack laboratory evidence of measles immunity.

1. How should we handle cases where the physician administers a dose of MMR at 1–2 years of age, then runs labs for titers a month later that show immunity to measles, mumps, and rubella?

Laboratory evidence of immunity is considered valid per ACIP recommendations, so we would consider this person to be immune as long as the labs demonstrated immunity to all three diseases covered by MMR vaccine. If even one disease shows as equivocal or not immune, the second dose of MMR should be administered to complete the series. Additionally, if the school or jurisdiction will not accept the laboratory evidence and requires 2 doses of MMR vaccine for all school-age children, we recommend you follow those local requirements. If a second dose of MMR vaccine is given, further serologic testing is not recommended following the second dose of vaccine. Two valid doses of MMR vaccine are considered acceptable evidence of immunity regardless of any later titer results.

1. Could we use MMRV for the second dose of MMR and the first dose of varicella vaccine in a 4-year-old patient?

Yes. As long as there are no medical contraindications, MMRV can be used in anyone 12 months of age through 12 years of age. MMRV is not FDA-approved or ACIP-recommended for anyone 13 years of age or older. In the presentation, we discussed a slight increased risk of febrile seizures for young children if MMRV is administered for the first dose. So, unless the parent or caregiver has a preference for MMRV, CDC recommends that separate MMR and varicella vaccines be administered at separate sites for the first dose in children 12 through 47 months of age. For the second dose at 15 months through 12 years of age, or if the first dose is given at 48 months of age or older, MMRV is generally preferred because the risk of a febrile seizure is less.

1. Do you recommend MMR vaccine for infants 6–12 months of age who are traveling within the United States to areas currently affected by measles?

Health care providers should check with the public health authorities in the area to which the family plans to travel. If that area’s public health authority recommends that infants 6–12 months of age should be vaccinated to protect them from measles, you may apply this recommendation to the infant who is traveling to the outbreak area. Be sure to tell the parents that this dose will not count toward the 2-dose series that is recommended beginning at 1 year of age. You should also discuss the option of avoiding travel to the area until the outbreak has resolved.

1. It is my understanding that MMRV is only recommended for the second dose of MMR and varicella vaccines, but in the presentation, it was said that it can be given for both doses.

If the first dose is given at 48 months of age or older, then MMRV is generally preferred. Unless the parent or caregiver has a preference for MMRV, CDC recommends that separate MMR and varicella vaccines should be administered at separate sites for the first dose in children 12 through 47 months of age. MMRV is not approved for use in persons 13 years of age and older.

1. What is the recommendation for someone who has 2 documented doses of MMR vaccine, but then has a titer done to meet job/school requirements and it shows no immunity?

ACIP recommends that documentation of 2 valid doses of MMR vaccine supersedes any subsequent serologic testing, even if titers are negative. ACIP does not recommend serologic testing after vaccination because commercial tests may not be sensitive enough to reliably detect vaccine-induced immunity. Providing the ACIP recommendation is often enough to convince the organization that required serology that the valid doses are sufficient evidence of immunity. However, if the employer or school still will not accept the ACIP recommendations for acceptable evidence of immunity, then you may have no choice but to follow their requirements for vaccination.

1. Can you please clarify the time period between administering live vaccine and other killed vaccines?

Generally, all live vaccines that are indicated for a patient should be given on the same day or you should wait 28 days between live vaccines. This is because the immune response to one live-virus vaccine might be impaired if administered within 28 days of another live-virus vaccine.

Any inactivated vaccine can be administered either simultaneously or at any time before or after a different inactivated or live vaccine. There are some exceptions, which are discussed at https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/timing.html.

1. You mentioned that adults with 2 documented doses of MMR who have a negative or equivocal measles titer should not be revaccinated. How can we be certain that the doses of MMR the person received were not compromised by vaccine storage and handling failures?

ACIP does not recommend serologic testing after vaccination because commercial tests may not be sensitive enough to reliably detect vaccine-induced immunity. In looking at any vaccination record, you are trusting that the providers who stored, handled, and administered the vaccines did so in accordance with best practice standards. We continue to recommend that providers follow the storage and handling recommendations in CDC’s Vaccine Storage and Handling Toolkit (<https://www.cdc.gov/vaccines/hcp/admin/storage/index.html>).

1. Are there single-antigen vaccines for measles, mumps and rubella in the United States?

No, there are no single-component products available in the US. If any single component of MMR vaccine is required, the combined vaccine should be used to fulfill the requirement.

1. Often travelers wish to be vaccinated less than 2 weeks before they plan to travel. With thermal screening done and potential fever 7–12 days after vaccination, should patients be given a letter about the potential for fever or should vaccine not be administered to such travelers?

Travel vaccines should be administered according to ACIP and CDC travelers’ health recommendations (<https://wwwnc.cdc.gov/travel>). Ideally, the traveler should receive those vaccines far enough in advance that they will not be at risk for fever when they travel. We also advise that providers educate patients on what to do in the event of common adverse events following vaccination (such as fever, pain, and swelling at the injection site). Be sure to recommend appropriate over-the-counter, fever-reducing medications.

We do not have a recommendation to provide a letter that would allow a febrile passenger to circumvent airport screening systems. Fevers during travel should be assessed on a case-by-case basis because a fever could be due to something other than vaccination (i.e., contagious illness or other cause posing risk to travelers).

1. Can persons who are immunocompromised receive MMR vaccine?

According to ACIP recommendations, immunosuppression is a contraindication to MMR vaccination. The ACIP recommendations state:

MMR and MMRV vaccine should not be administered to 1) persons with primary or acquired immunodeficiency, including persons with immunosuppres­sion associated with cellular immunodeficiencies, hypogam­maglobulinemia, dysgammaglobulinemia and AIDS or severe immunosuppression associated with HIV infection; 2) persons with blood dyscrasias, leukemia, lymphomas of any type, or other malignant neoplasms affecting the bone marrow or lymphatic system; 3) persons who have a family history of congenital or hereditary immunodeficiency in first-degree relatives (e.g., parents and siblings), unless the immune compe­tence of the potential vaccine recipient has been substantiated clinically or verified by a laboratory; or 4) persons receiving systemic immunosuppressive therapy, including corticosteroids ≥2 mg/kg of body weight or ≥20 mg/day of prednisone or equivalent for persons who weigh >10 kg, when administered for ≥2 weeks (*258*). Persons with HIV infection who do not have severe immunosuppression should receive MMR vaccine, but not MMRV vaccine (see subsection titled “Persons with HIV Infection”). Measles inclusion body encephalitis has been reported after administration of MMR vaccine to immunosup­pressed persons, as well as after natural measles infection with wild-type virus (see section titled “Safety of MMR and MMRV Vaccines”) (*259*–*261*).

<https://www.cdc.gov/mmwr/pdf/rr/rr6204.pdf>

1. If a person has a history of severe allergic reaction to egg, should they be vaccinated?

A history of anaphylactic reaction to a vaccine or any vaccine component is always a contraindication. This is true for every vaccine—not just MMR and MMRV.

ACIP recommendations state, “Immediate anaphylactic reactions after MMR vaccination are rare (1.8–14.4 per million doses). Although measles- and mumps-containing vaccines are grown in tissue from chick embryos, the rare, serious allergic reactions after MMR vaccination are not believed to be caused by egg antigens but by other components of the vaccine, such as gelatin or neomycin.”

<https://www.cdc.gov/mmwr/pdf/rr/rr6204.pdf>

1. A patient has received 2 doses of MMR and previously showed serological immunity, but now shows no immunity. Should they be revaccinated?

No. Written documentation of adequate vaccination supersedes subsequent serological testing.

1. I need more information about tuberculin testing (TST) and MMR vaccine.

Inactivated vaccines can be given on the same day or at any time after a TST is done. A TST can be applied before or on the same day that live-virus vaccines (e.g., MMR, varicella) are given. However, if a live vaccine was given on the previous day or earlier, the TST should be delayed for at least 4 weeks (28 days). If a live vaccine is given prior to the application of a TST, it can reduce the reactivity of the skin test because of mild suppression of the immune system and result in a false-negative TST.

A more specific test for diagnosis of tuberculosis or latent tuberculosis infection is the interferon-gamma release assay (IGRA). The same timing guidelines that apply to the interval between a live vaccine and TST apply to IGRA (i.e., 28 days between a live vaccine and IGRA if they do not occur on the same day) because IGRA (like TST) might be suppressed through immunologic mechanisms.

A two-step tuberculin test is recommended in certain situations. This test consists of two TSTs (or a TST followed by IGRA) separated by 1–3 weeks. If a live vaccine is administered, the first dose of a two-step TST should be delayed for 4 weeks, and if additional doses of live vaccines are indicated thereafter, they should be delayed until the second TST (or the IGRA after an initial TST).

For more information, please see <https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/special-situations.html#administration>.

1. Is an arthritis reaction possible after MMR vaccination?

ACIP recommendations state:

“Joint symptoms are associated with the rubella component of MMR vaccine (*301*). Among persons without rubella immunity who receive rubella-containing vaccine, arthralgia and transient arthritis occur more frequently among adults than children, and more frequently among postpubertal females than males (*302*,*303*). Acute arthralgia or arthritis are rare among children who receive RA 27/3 vaccine (*160*,*303*). In contrast, arthralgia develops among approximately 25% of nonimmune postpubertal females after vaccination with rubella RA 27/3 vaccine, and approximately 10% to 30% have acute arthritis-like signs and symptoms (*154*,*160*,*282*,*301*). Arthralgia or arthritis generally begins 1–3 weeks after vaccination, usually is mild and not incapacitating, lasts about 2 days, and rarely recurs (*160*,*301*,*303*,*304*).”

<https://www.cdc.gov/mmwr/pdf/rr/rr6204.pdf>

1. If a person was born before 1957, should they be vaccinated?

Birth before 1957 is considered acceptable evidence of immunity.

Although birth before 1957 is considered acceptable evidence of measles immunity, health care facilities should consider vaccinating unvaccinated personnel born before 1957 who do not have other evidence of immunity with 2 doses of MMR vaccine (minimum interval of 28 days between doses).

During an outbreak of measles, health care facilities should recommend 2 doses of MMR vaccine at the appropriate interval for unvaccinated health care personnel regardless of birth year if they lack laboratory evidence of measles immunity.

1. Have there been autism studies in relation to the entire vaccination schedule as opposed to just MMR vaccine?

Information on MMR vaccine safety can be found at <https://www.cdc.gov/vaccinesafety/vaccines/mmr/mmr-studies.html>.

Information on multiple vaccines and the immune system can be found at <https://www.cdc.gov/vaccinesafety/concerns/multiple-vaccines-immunity.html>.

Information on no link between vaccines and autism can be found at <https://www.cdc.gov/vaccinesafety/concerns/autism.html>.

1. In India, vaccine is administered at 9 months, with the second dose given at 15 to 18 months. What is the rationale for this schedule?

The Ministry of Health or other appropriate national public health authority for India should comment on the rationale for its vaccination schedule.

1. When will the presentation be accessible on demand?

The archived versions of the Pink Book webinars are usually posted within a few weeks of recording and can be found at <https://www.cdc.gov/vaccines/ed/webinar-epv/index.html>.

1. When a child who is current on vaccinations travels out of the country, what is the rule of thumb for vaccinations upon their return and prior to entering school?

Infants 6 through 11 months of age should receive 1 dose of MMR vaccine prior to travel. Children 12 months of age or older should have 2 doses of MMR vaccine. Adolescents without evidence of immunity to measles should have documentation of 2 doses of MMR vaccine.

To determine if there is a school rule or policy procedures following travel, you should check directly with the school system or health department in charge of your jurisdiction. Generally, if a child was fully vaccinated prior to travel, they should be immune. The concern would be greater for a child who traveled without immunity.

1. A patient works at an international airport and is in contact with international travelers but has no documented doses of MMR. Should they be vaccinated?

Adults born in 1957 or later need 1 dose or more of MMR unless they have other evidence of immunity.

1. If a health care provider has only 1 documented dose of MMR, but titers show immunity, should they still receive a second dose?

Laboratory evidence of immunity is considered valid per ACIP recommendations, so we would consider this to be acceptable as long as the lab results demonstrated immunity to all three diseases covered by MMR vaccine.

1. If someone was born before 1957 and will be traveling internationally, do they need to have a titer done?

No, people born before 1957 are presumed to be immune to measles, mumps, and rubella.