Measles Post-Exposure Prophylaxis (PEP) for Non-Symptomatic Susceptible Contacts

To determine appropriate post-exposure prophylaxis:

- Determine patient's risk factor and identify time from first exposure to measles case.
- PEP should only be given to a person without presumptive evidence of immunity to measles.
- Contact the NCDHHS Communicable Disease Branch (CDB) Epidemiologist On Call (919-733-3419) with questions or if further guidance is needed.

People exposed to measles who do not have presumptive evidence of immunity to measles should be offered post-exposure prophylaxis (PEP). There are two types of PEP for measles: MMR vaccine or immune globulin (IG). The efficacy of either form of PEP for preventing measles disease is greatest when administered as soon as possible after exposure. Timing is crucial for both forms of PEP as MMR must be given within 72 hours of exposure to measles and IG must be given within six days of exposure.

Recommended Dose and Timing of Measles PEP (see footnotes 1-5)

Risk Factor	Time from First Exposure If no PEP given, home quarantine for 21 days	
	Less than 72 hours	**72 hours through day six**
Infant less than 6 months old [1]	Give intramuscular IG (IMIG): 0.5 ml/kg (max dose = 15 mL) Home quarantine for 28 days	Give IMIG: 0.5 ml/kg IM (max dose = 15 mL) Home quarantine for 28 days
Infant 6 through 11 months old [1, 2]	Give MMR vaccine if no contraindications No quarantine needed	Give IMIG: 0.5 ml/kg IM (max dose = 15 mL) Home quarantine for 28 days
Susceptible pregnant woman [3]	Give intravenous IG (IVIG): 400 mg/kg Home quarantine for 28 days	Give IVIG: 400 mg/kg Home quarantine for 28 days
Severely immunocompromised [3, 4] (Regardless of immune status)	Give IVIG: 400 mg/kg Home quarantine for 28 days	Give IVIG: 400 mg/kg Home quarantine for 28 days
Susceptible close contact[5] over 1 year old	Give MMR vaccine if no contraindications No quarantine needed	Not generally recommended for healthy individuals over 1 year old

1. IMIG is recommended for infants younger than 6 months old, and for infants age 6-11 months who do not receive MMR within 72 hours of exposure. Wait six months after IMIG administration before vaccinating with MMR/varicella (MMRV). Do not administer MMR vaccine and IG at the same time.
2. Infants ages 6-11 months who receive MMR vaccine should be revaccinated with two additional doses after their first birthday according to the routine pediatric schedule.
3. IVIG is recommended for severely immunocompromised people and pregnant women. IG is not indicated for people who have received one dose of measles-containing vaccine at 12 months or older unless they are severely immunocompromised. Wait eight months after IVIG before vaccinating with MMR or MMRV.
4. The degree of altered immunocompetence and appropriate PEP in a patient should be determined by a physician. Immunocompromising conditions may include people:
   - With severe primary immunodeficiency
   - Who have received a hematopoietic cell transplant until at least 12 months after finishing all immunosuppressive treatment, or longer in patients who have developed graft-versus-host disease
   - On treatment for acute lymphoblastic leukemia (ALL) until at least six months after completion of immunosuppressive chemotherapy
   - Within two months after solid organ transplantation
   - Who are 12 months post immunosuppressive treatment who have received a bone marrow transplant, or longer in patients who have developed graft-versus-host disease
   - Who are living with HIV with severe immunosuppression with a CD4 T-lymphocyte count <200 cells/mm^3 (age >5 years) and percentage <15 (all ages), and those who have not received MMR vaccine since receiving effective antiretroviral therapy
   - Other severely immunocompromising conditions can be found in the ***Red Book* Measles chapter**
5. A susceptible contact is a person without documentation of at least one MMR or other evidence of immunity and has been exposed in settings with contact to a measles case. CDB can help determine who is a contact.

For additional PEP information for people exposed to measles, please see *Red Book* Measles chapter Table 3.32 and Table 3.33.

IMIG Dosing: For Persons Weighing Less than 30 kg (66 lbs.)

- Administer 0.5 ml/kg of IMIG in the anterolateral aspect of the upper thigh(s).
- Do not administer more than 3 mL of IMIG per injection site; for infants and children weighing greater than 6 kg, multiple injections are required.
- The maximum total dose per IMIG administration is 15 mL.
- Persons weighing greater than 30 kg (66 lbs.) should receive IVIG since they are unlikely to receive an adequate dose via IMIG.

Contraindications

- Do not give IG to people with immunoglobulin A (IgA) deficiency. Persons with IgA deficiencies have the potential for developing antibodies to IgA and therefore could experience an anaphylactic reaction when IG is administered.
- Do not give IMIG to persons with severe thrombocytopenia or any coagulating disorder that would contraindicate intramuscular injections.
- Do not give IG to persons with a history of anaphylactic reaction to a previous dose of IG.

Precautions

- Pregnancy: While impacts of IG on fetal development and pregnant women is unknown, measles during pregnancy can result in adverse outcomes for pregnant women, such as pneumonia and death. Measles can also lead to adverse pregnancy outcomes including pregnancy loss, premature delivery and low birth weight. Clinicians should weigh all risks/benefits when considering IG administration in pregnant women. For more information visit: *The Society for Maternal-Fetal Medicine Measles and Pregnancy: What Maternal-Fetal Medicine Subspecialists Need to Know*.
- Careful administration is required in persons with a known hypersensitivity to immune globulin preparations. Have epinephrine available to immediately treat any acute hypersensitivity reactions. Concerns/side effects from IG: thrombosis, risks with human blood products, infusion reactions.

Planning Access to PEP

Preparing for measles outbreaks includes planning for PEP. Measles PEP provides protection and/or modifies the clinical course of measles among susceptible people. Prior planning is critical to ensure rapid availability of PEP following a verified measles exposure. Public health officials and health care providers should review and update their plan to obtain MMR and IG doses when needed for measles PEP.

Before Cases are Identified

1. Establish a plan for obtaining MMR and IG, especially if there are areas with low MMR vaccine coverage. IG is not available through the Childhood Vaccine Program and the Adult Vaccine Program.
2. Local health departments should work with local hospitals, health care systems and health care coalitions to identify avenues for accessing MMR and IG.
3. Explore options for purchasing IG and process to procure or obtain when needed. Dependent upon available funding, state and local governments can become members of MMCAP Infuse (a national cooperative group purchasing organization for government facilities that provide health care services). IMIG can be purchased at a contracted rate.

After Cases are Identified

1. Coordinate with local health departments, hospitals, and/or health care systems/coalitions to identify MMR or IG doses that are immediately available. IMIG does not require an infusion center or administration at a hospital, but local hospitals may have doses that could be immediately accessible.
2. If LHDs, hospitals and other sources do not have sufficient supply of IG doses, consider these options for product ordering:
    a. Government run facilities may contact the Senior Healthcare Consultant (SHCs) for MMCAP Infuse distributors for the Southeastern Region. To fill orders rapidly, you must establish an MMCAP account.
    b. Contact distributors identified by Grifols where GamaSTAN may be available.
    c. If existing local supplies are not sufficient and local procurement is not possible, contact NCDHHS CDB Epi-On Call to determine if you may be able to receive state-supplied MMR or IMIG.

Intramuscular Immune Globulin

GamaSTAN is the only IMIG available in the U.S. GamaSTAN is supplied in 2 mL and 10 mL single dose vials. It is stored at 2-8ºC (36-46ºF) and has a shelf life of three years. Providers should be aware that the GamaSTAN package insert indicates a 0.25 mL/kg dose that is lower than the current CDC recommendation of 0.5 mL/kg. CDC's recommendation is based on a 2013 ACIP article citing the need for the higher dose due to decreased antibody concentration in IG products.

Additional Resources

- Chapter 7: Measles | Manual for the Surveillance of Vaccine-Preventable Diseases | CDC
- Measles (Rubeola) North Carolina DHHS
- Measles | Red Book: 2024–2027 Report of the Committee on Infectious Diseases | Red Book Online | American Academy of Pediatrics
- Measles Vaccine Recommendations | Measles (Rubeola) | CDC
- Prevention of Measles, Rubella, Congenital Rubella Syndrome, and Mumps, 2013

Program Contacts

- **North Carolina Immunization Program Nurse On-Call:** 919-707-5575
- **North Carolina Communicable Disease On-Call:** 919-733-3419
- **North Carolina Public Health Preparedness and Response (PHP&R) On-Call:** 1-888-820-0520