Measles Post-Exposure Prophylaxis
Recommendations for Non-Symptomatic Susceptible Contacts

Definition of susceptible contact:

Post-exposure prophylaxis (PEP) for measles can include either MMR vaccination or immune globulin (IG), and can be considered for asymptomatic susceptible contacts to measles. Either form is most effective when given as soon as possible after exposure to measles: MMR vaccine is effective as PEP if given within 72 hours of initial measles exposure, and immunoglobulin (IG) is effective if given within six days of exposure. Do not administer MMR vaccine and IG simultaneously, as this practice invalidates the vaccine.

A **contact** has had direct contact with nasal or throat secretions of infected persons or has shared airspace with an infected person.

- When assessing this, keep in mind that a measles-infected person is infectious for 4 days prior to the onset of the rash as well as 4 days thereafter, and that infectious virus particles can remain in room air for at least 2 hours after the infectious person leaves the room.
- **Intense exposure** occurs when a contact is a household member, carpools, or is in child day care with an infected person.

A **susceptible** Individual is a person who has none of the following evidence of immunity to measles:

- written documentation of adequate vaccination:
    - one 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
    - two doses of measles-containing vaccine for school-age children and adults at high risk, including college students, healthcare personnel, and international travelers
- laboratory evidence of immunity
- history of laboratory confirmed measles disease
- birth before 1957

Risk factors and choice of PEP

Appropriate post-exposure prophylaxis depends on the contact's age, the presence/absence of special risk factors, and the time that has elapsed since the individual's exposure began (see Table below).

Risk factors for severe illness or complications from measles include:

- Infants <12 months old

- Pregnant women without evidence of measles immunity
- People with compromised immune systems, regardless of previous measles vaccination status. This would include (but is not limited to):
    - Severe primary immunodeficiency
    - Bone marrow or stem cell transplant until at least 12 months after finishing all immunosuppressive treatment, or longer in patients who have developed graft-versus-host disease
    - Patients on treatment for acute lymphocytic leukemia within and until at least 6 months after completion of immunosuppressive chemotherapy
    - Patients with a diagnosis of AIDS or HIV-infected persons with severe immunosuppression defined as CD4 percent <15% (all ages) or CD4 count <200 lymphocytes/mm^3 (aged >5 years) and those who have not received MMR vaccine since receiving effective ART (some experts include HIV-infected persons who lack recent confirmation of immunologic status or measles immunity)

Individuals listed above at high risk for severe disease and complications from measles should receive IG, either IV or IM, as noted in the chart below. As a general statement, use of IG is meant to prevent or ameliorate the severity of measles in those individuals at high risk, *not* as a form of outbreak control.

TABLE – DOSE AND TIMING OF MEASLES PEP		
Risk Status	**Time from First Exposure**	
	< 72 hours	**through 6 days**
Age > 12 months, no risk factor	MMR vaccine 1st dose, or 2nd MMR if ≥28 days from MMR #1	Consider IGIM for intense exposure.
Infant < 6 months old	IGIM: 0.5 mL/kg	IGIM: 0.5 mL/kg*
Infant 6 through 12 months	MMR (preferred) or IGIM 0.5 mL/kg	IGIM: 0.5 mL/kg*
Pregnant woman	Intravenous IG (IGIV): 400 mg/kg	IGIV: 400 mg/kg
Severely immunocompromised	IGIV: 400 mg/kg	IGIV: 400 mg/kg
*Maximum IM dose: 15 mL		

Contraindications

- Contraindications for the use of MMR are the usual ones for this vaccine.
- Contraindications regarding IG include immunoglobulin A deficiency or a history of anaphylactic reaction to a previous dose of IG.

IGIM administration (for use in persons weighing less than 30 kg)

- Administer 0.5 mL/kg of IGIM in the anterolateral aspect of the upper thigh
- Do not administer more than 3 mL of IGIM per injection site; for infants and children weighing >6 kg, multiple injections are required
- Maximum total dose per IGIM administration is 15 mL

- IG may prolong the incubation period so extending the monitoring period for individuals who received IG as PEP may be considered
    - The average incubation period for measles is 11–12 days and the average interval between exposure and rash onset is 14 days, with a range of 7–21 days

Management of susceptible contacts after PEP

- Except in healthcare settings, individual's not fully vaccinated people who receive their second dose of MMR vaccine within 72 hours after exposure may return to childcare, school, or work.
    - Healthcare personnel without evidence of immunity or after receipt of IG for PEP should be excluded from duty from day 3 after first exposure to day 21 after last exposure, regardless of post-exposure vaccine or IG administration.
- For those who received their first dose of MMR for PEP within 72 hrs. or those receiving IG with 6 days, their settings (such as childcare, school, or work), factors such as immune status, intense or prolonged contact, and presence of populations at risk, should be taken into consideration before allowing people to return.
    - These factors may decrease the effectiveness of PEP or increase the risk of disease and complications depending on the setting to which they are returning.
    - Persons weighing >30 kg who receive IGIM are unlikely to receive an effective dose and should still be recommended for exclusion and social distancing. IGIV may be used in special situations (consult with Health Department)

Follow Up of Contacts

- All individuals receiving PEP, as well as susceptible contacts who do not qualify for PEP, should be educated regarding self-monitoring for symptoms of measles.
    - Symptoms include: prodrome of fever (as high as 105°F) and malaise, cough, coryza (runny nose), and conjunctivitis (red, irritated eyes), followed by a maculopapular rash. The rash spreads from head to trunk to lower extremities
        - Note: fever (reported as abnormal or elevated 102°F or higher oral equivalent) has been observed in about 15% of children 5-12 days after MMR vaccination and approximately 5% develop a transient rash 7 to 10 days after MMR vaccination
    - They should be encouraged to contact their health care provider by phone to discuss symptoms, rather than coming to the office or ED.
- Any susceptible person > 12 months old exposed to measles who received IG should be urged to subsequently receive MMR vaccine if not contraindicated.
    - MMR should be given no earlier than 6 months after IGIM or 8 months after IGIV.
- If IG has been given within 2 weeks following administration of MMR or varicella vaccine, the individual should be revaccinated as the IG invalidates the live vaccine.

- The revaccination should be given no earlier than 6 months after IGIM or 8 months after IGIV.

Sources:

Manual for the Surveillance of Vaccine-Preventable Diseases, Chapter 7: Measles.
https://www.cdc.gov/vaccines/pubs/surv-manual/chpt07-measles.html

Prevention of Measles, Rubella, Congenital Rubella Syndrome, and Mumps, 2013: Summary Recommendations of the Advisory Committee on Immunization Practices (ACIP).
https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm