

## Measles Clinical Practice Advisory for Perinatal Providers

3/22/2024

This following is designed for perinatal bedside providers to aid in the clinical management of pregnant people exposed to measles and their newborns.<sup>1</sup> Further CDC guidance can be found [here](#).

### Measles (Rubeola) 101

- One of the most contagious infections, people who are infected can transmit it to ~90% of their susceptible contacts.
- Once infected, a prodrome of high fever, malaise, and one of the “three Cs” - cough, coryza (runny nose,) conjunctivitis develops after 10-12 day incubation period (incubation period can be as long as 21 days.)
- Near end of prodrome, Koplik spots may appear on buccal mucosa (small white lesions with erythematous base.)
- Rash follows 3-4 days after prodrome: starts on hairline, spreads to trunk and lower extremities. 7-21 day from exposure to onset of rash (typically 10-14 days)
- People with measles are infectious 4 days before through 4 days after the rash onset.
- Infectious virus can be found airborne *up to 2 hours* after the infected person has left the room.
- **MMR 97% effective in preventing measles, MMR cannot be given in pregnancy.**

### Effect of measles in pregnancy

- Increased risk of
  - Hospitalization
  - Pneumonia
  - Spontaneous pregnancy loss
  - Intrauterine fetal demise
  - Preterm labor
  - Preterm delivery
- No increased risk of congenital anomalies

### Transmission of maternal measles to fetus (congenital measles)

- Can occur if maternal measles infection develops within 10 days of delivery.
- Increased risk of severe disease in the newborn, with a 30-50% fatality rate reported before the polyvalent immunoglobulin era, and an increased risk of [subacute sclerosing panencephalitis](#).<sup>2</sup>
- **Congenital measles risk decreased if newborn given pooled immune globulin**

## Illinois Department of Public Health

## Recommendation for determining measles immunity

- **Document measles immunity in *all* pregnant patients with measles IgG testing, ideally at first prenatal visit (with Rubella immunity testing)**
- Measles immunity is defined as:
  - Written documentation of **2 doses** of a measles, mumps, and rubella virus-containing vaccine administered on or after the first birthday.
    - If a pregnant person has received only one dose of a measles, mumps, and rubella virus-containing vaccine, stat serology to determine immunity should be done to determine need for IVIG.
  - Laboratory confirmation of past infection or lab confirmation of immunity to measles, i.e., **IgG to Rubeola** or measles (NOT IgM- IgM is considered evidence of either very recent vaccination or acute measles infection.)
- 16.5% of prenatal patients in 2005 study were not immune to measles.<sup>3</sup>
- Rubella (German Measles) immunity *not a surrogate* for Rubeola (measles) immunity, 12% of those immune to rubella were not immune to measles.<sup>4</sup>

## Recommendation for pregnant people without measles immunity exposed to measles

- Pregnant people with only 1 dose of MMR should get stat measles IgG testing to determine need for post exposure prophylaxis (PEP)
- Consider PEP: IV IG 400mg/kg, once, within 6 days of exposure. **See PEP table below.**
- Home quarantine after last day of exposure
  - 28 day quarantine *if postexposure IV IG given*
  - 21 day home quarantine *if no postexposure IV IG given*
- Pregnant women should NOT receive MMR vaccination during pregnancy; if they received PEP with IVIG, MMR should be deferred until at 8 months and no longer pregnant.
- Please note that receipt of post exposure prophylaxis through immunoglobulin *does not shorten duration of quarantine.*
- **IV IG CAN be given for those with unknown immunity, while waiting for determination of measles immunity testing**

## Recommendation for pregnant people with suspected or confirmed measles

- Consider delaying in-person prenatal visits or converting to telehealth whenever possible during isolation period.
- Notify triage/L&D prior to patient's arrival to ensure they can prepare a location; hospital infection preventionist on call should also be notified ASAP.
- Isolate in airborne infection isolation room (AIIR)
- In settings where [Airborne Precautions cannot be implemented](#) due to limited engineering resources, masking the patient (to decrease newborn exposure) and placing the patient in a private room with the door closed will reduce the likelihood of airborne transmission until the patient is either transferred to a facility with an AIIR or returned home.

- If AIIR room is unavailable, place a portable air scrubber in the room and/or vent to the outside, if a unit is available.
- Airborne precautions should be used which includes use of a fit-tested NIOSH-approved [N95 or higher level respirator for all healthcare personnel](#) (regardless of their presumptive evidence of immunity to measles).
- Ensure all staff caring for the patient have documented [presumptive immunity](#).
- Healthcare personnel *without* acceptable presumptive evidence of measles immunity *should not* enter a known or suspected measles patient's room if a health care provider WITH presumptive immunity is available. [CDC Measles in Healthcare Settings Recommendations](#)
- Airborne Precautions should be used for Labor & Delivery, including operating room and general anesthesia considerations. (Another example of when Airborne Precautions are used is when caring for a patient with primary varicella.)
- If using an operating room or other room which usually has positive pressure ventilation, ensure the infection prevention is aware and engineering has turned positive pressure off and negative pressure on, if possible.
- Limit transport and movement of patients outside of the room to medically necessary purposes. If transport or movement outside an AIIR is necessary, instruct patients to wear a surgical mask, if possible, and observe Respiratory Hygiene/Cough Etiquette. Healthcare personnel transporting patients who are on Airborne Precautions do not need to wear a mask or respirator during transport if the patient is wearing a mask.
- Visitors/support person/doulas should be limited to those who have documented immunity to measles.
- Supportive care

### **Recommendation for infants born to pregnant person *without* measles immunity exposed to measles**

- There is limited data on need for infant separation from birth parent during quarantine period; can consider separation, after shared decision-making, during window of birth parent's quarantine.
  - 28 day quarantine *if postexposure IV IG given*
  - 21 day home quarantine *if no postexposure IV IG given*

### **Recommendation for infants born to pregnant person *with suspected or confirmed measles***

- If pregnant person has suspected or confirmed measles within 10 days of delivery
  - Notify the pediatrician or NICU who will care for the infant as soon as possible.
  - Pooled immune globulin 0.5mL/kg IM or 400mg/kg IV.
  - Test neonate as below
  - There is limited data on need for infant separation from birth parent during the infectious period (from 4 days before the maternal rash onset through 4 days after appearance of the rash.) The high level of contagiousness of measles and the potential for severe sequelae of neonatal measles infection should be considered in making patient-provider decisions regarding infant-mother separation. Decision for separation should be made in consultation with facility infection control and the public health department.
  - If the infant is separated during the infectious period, pumped breastmilk can still be given.<sup>5</sup>

- If the dyad is not separated and a negative pressure AIIR is not available, consider additional precautions such as placing portable HEPA filters in the room or opening windows (weather permitting) and cleaning surfaces at least daily.

## Recommendation for provider reporting and testing suspected measles cases

- Immediately report to their [local health departments](#) any suspect measles cases *at the time it is first suspected and prior to clinical testing*.
- Delays in reporting might result in avoidable exposures as well as missed prophylaxis options for nonimmune close contacts.
- If unable to reach their local health department after-hours, providers can call IEMA at 217-782-7860 to reach someone at IDPH.
- Testing: IDPH laboratory provides PCR testing of *throat or nasopharyngeal swabs* for measles at no cost, *serum sample* should be sent to hospital/commercial lab.
  - It is recommended that throat or nasopharyngeal swab testing of suspect measles cases by PCR be conducted at the state lab as testing at commercial laboratories can delay results which then delays a response if the case is positive (see instructions for submission).
  - **Healthcare providers should obtain both a serum sample and a throat swab (or nasopharyngeal (NP) swab) from patients suspected to have measles.** Swabs should be placed in viral transport media (VTM).
  - Providers can consider sending urine in addition to a nasopharyngeal/oropharyngeal swab. If nasopharyngeal/oropharyngeal swabs are not obtainable, urine can also be used for PCR testing.
- *Authorization must be obtained from the health department prior to submission to the state lab. The local health department should be contacted immediately to report suspicion of measles.*

## Additional notes on measles Infection Prevention and Control

- In addition to specific perinatal infection prevention recommendations above, see IDPH guidance on measles in healthcare settings as well as CDC guidance: [Interim Measles Infection Prevention Recommendations in Healthcare Settings | CDC](#)
- Notify hospital infection prevention/hospital epidemiologist of all cases of suspected or confirmed measles, as well as all individuals with exposure ASAP.
- The local health department, who should be notified of all suspect cases, will provide guidance on duration of isolation, quarantine, and contact tracing.
- Ensure communication is made to any providers/clinics in which a birthing person or infant will be seen in follow up while they are still in isolation or quarantine so plans can be made to safely accommodate those visits without additional healthcare exposures.

## References

1. Rasmussen SA and Jamieson DJ. What obstetric health care providers need to know about measles and pregnancy. *Obstet Gynecol* 2015;126:163-70.

2. Campbell H, Andrews N, Brown KE, Miller E. Review of the effect of measles vaccination on the epidemiology of SSPE. *Int J Epidemiol* 2007;36:1334-48.
3. Haas DM, Flowers CA, Congdon CL. Rubella, rubeola, and mumps in pregnant women: susceptibilities and strategies for testing and vaccinating. *Obstet Gynecol* 2005;106:295-300.
4. Kennedy CM, Burns BA, Ault KA. Does rubella immunity predict measles immunity? A serosurvey of pregnant woman. *Infect Dis Obstet Gynecol* 2006;2006:13890.
5. American Academy of Pediatrics, Committee on Infectious Diseases Red Book, 2021-2024.

**Post-exposure prophylaxis (PEP) for measles exposures who ARE pregnant or immunocompromised**

BOI Script Category	Age range	Measles immune status <sup>a</sup>	PEP type depending on time after initial exposure		
			≤3 days (≤72 hours)	4-6 days	>6 days
Severely Immuno-compromised <sup>b</sup>	<12 months	Will need IG regardless of measles immune status	<ul style="list-style-type: none"> <li>• Give intramuscular immunoglobulin (IMIG)<sup>cd</sup></li> <li>• Home quarantine<sup>e</sup> for 28 days after last exposure</li> </ul>		<ul style="list-style-type: none"> <li>• PEP not indicated (too late)<sup>f</sup></li> <li>• Home quarantine<sup>e</sup> for 21 days after last exposure</li> </ul>
	≥12 months		<ul style="list-style-type: none"> <li>• Give intravenous immunoglobulin (IVIG)<sup>cd</sup></li> <li>• Home quarantine<sup>e</sup> for 28 days after last exposure</li> </ul>		
Pregnant	n/a	Immune (IgG positive or 2 MMR vaccine doses)	<ul style="list-style-type: none"> <li>• PEP not indicated<sup>f</sup></li> </ul>		
		Non-immune (IgG negative)	<ul style="list-style-type: none"> <li>• Give intravenous immunoglobulin (IVIG)<sup>cd</sup></li> <li>• Home quarantine<sup>e</sup> for 28 days after last exposure</li> </ul>		<ul style="list-style-type: none"> <li>• PEP not indicated (too late)<sup>f</sup></li> <li>• Home quarantine<sup>e</sup> for 21 days after last exposure</li> </ul>
		Unknown immunity	<ul style="list-style-type: none"> <li>• Draw titers (measles IgG) STAT to determine immunity; proceed as above based on titer results</li> </ul>		<ul style="list-style-type: none"> <li>• PEP not indicated (too late)<sup>f</sup></li> <li>• Home quarantine<sup>e</sup> for 21 days after last exposure</li> </ul>

<https://www1.nyc.gov/assets/doh/downloads/pdf/imm/pep-measles-providers.pdf>