



April 30, 2014

Dear Healthcare Providers and Public Health Colleagues:

On April 21, 2014, the Ohio Department of Health (ODH) was notified by the Knox County Health Department about a suspected measles outbreak. The index case-patients were unvaccinated travelers returning from the Philippines, a country experiencing a large outbreak of measles. As of April 30, 2014, there are 30 confirmed measles cases in six Ohio counties (Ashland, Coshocton, Holmes, Knox, Richland, and Wayne). As many healthcare providers have not seen a case of measles, the following information is provided as a reminder of the signs and symptoms of measles. This guidance was adapted from materials from the Centers for Disease Control and Prevention (CDC) and the Immunization Action Coalition.

Key Information

- Measles is common in many parts of the world. (The Philippines is currently experiencing an explosive outbreak, but importations can occur after any international travel, including to Europe.)
- Measles can be misdiagnosed as other rash illnesses (e.g. Kawasaki Disease, Dengue). Given the recent increase in cases in Ohio, be on the lookout for measles.
- Prompt isolation of patients suspected of having measles is critical, as any airborne exposure to a case (up to 2 hours after the infected person leaves an airspace) can result in transmission of measles.
- Viral specimens should be obtained on suspected case-patients (not just serology).

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

It takes an average of 10-12 days (range 7-21 days) from exposure to the first symptom, which is usually fever. The measles rash doesn't usually appear until approximately 14 days after exposure, 2-3 days after the fever begins.

What are the symptoms of measles?

Symptoms include fever, runny nose, cough, loss of appetite, conjunctivitis, and a rash. The rash usually lasts 5-6 days and begins at the hairline, moves to the face and upper neck, and proceeds down the body.

How serious is measles?

Measles can be a serious disease, with 30% of reported cases experiencing one or more complications. Death from measles occurs in 2 to 3 per 1,000 reported cases in the United States. Complications from measles are more common among very young children (younger than 5 years) and adults (older than 20 years).

What are potential complications of measles?

Diarrhea is the most common complication of measles (occurring in 8% of case-patients), especially in young children. Ear infections occur in 7% of reported case-patients. Pneumonia, occurring in 6% of reported case-patients, accounts for 60% of measles-related deaths. Approximately one out of one thousand infected persons will develop acute encephalitis, an inflammation of the brain. This serious complication can lead to permanent brain damage. Measles during pregnancy increases the risk of premature labor, miscarriage, and low-birth-weight infants, although birth defects have not been linked to measles exposure. Measles can be especially

severe in persons with compromised immune systems. Measles is more severe in malnourished children, particularly those with vitamin A deficiency. In developing countries, the fatality rate may be as high as 25%.

How does measles spread?

Measles is spread from person to person through the air by infectious droplets; it is highly contagious. In a closed setting the measles virus has been reported to have been transmitted by airborne or droplet exposure up to two hours after the measles case-patient occupied the area.

What does the measles rash look like?

These pictures are courtesy of the CDC Public Health Image Library.



What lab testing should be done?

Laboratory testing of suspect cases of measles is recommended. Both serology and respiratory samples (oropharyngeal, nasal, or nasopharyngeal) should be collected. Specimen collection guidance is included with this letter. The local health department can arrange for the shipping of specimens to the ODH Laboratory.

Who should be vaccinated?

All children, adolescents, and adults born in 1957 or later without a valid contraindication should have documentation of vaccination or other evidence of immunity. Additionally, during an outbreak, healthcare personnel who were born before 1957 without evidence of measles immunity should receive 2 appropriately spaced doses of MMR vaccine.

Which adults need two doses of MMR vaccine?

Certain adults are at higher risk of exposure to measles, mumps, and/or rubella and may need a second dose of MMR unless they have other evidence of immunity; this includes adults who are:

- Students in postsecondary educational institutions
- Healthcare personnel
- Living in a community experiencing an outbreak or recently exposed to the disease
- Planning to travel internationally
- People who received inactivated (killed) measles vaccine or measles vaccine of unknown type during 1963-1967 should be revaccinated with two doses of MMR vaccine

Why do healthcare personnel need vaccination or other evidence of immunity to measles?

People who work in medical facilities are at much higher risk for being exposed to disease than is the general population. Making sure that all employees are immune to these diseases protects both the employee and the patients with whom he or she may have contact. All people working in a healthcare facility in any capacity

should have documentation of vaccination or evidence of immunity, including full- or part-time employees, medical or non-medical, paid or volunteer, students, and those with or without direct patient responsibilities. Facilities should consider vaccinating healthcare personnel born before 1957 with 2 doses of MMR vaccine who lack laboratory evidence of measles, mumps, or rubella immunity or laboratory confirmation of previous disease. These facilities should vaccinate healthcare personnel with 2 doses of MMR during an outbreak of any of the diseases, regardless of birth year.

Additional Information for Healthcare Providers Regarding Measles

- MMR vaccine can be administered as post-exposure prophylaxis (PEP) if the healthcare provider sees a patient without evidence of immunity within 72 hours of exposure and IG can be administered if the patient is seen within 6 days of exposure.
- IG should be given as PEP to persons at risk for severe disease and complications (infants <12 months, pregnant women without evidence of measles immunity, and severely immunocompromised persons). Updated guidelines for administration of IG are in the current Advisory Committee on Immunization Practices (ACIP) MMR recommendations: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm>.
- It is important for healthcare providers to remind their patients that if they just received a vaccination, they may still develop a rash/fever. This could be a vaccine reaction, or it could be because the vaccine was not administered in time (i.e. the person may have been infected prior to receiving the vaccine).
- Healthcare providers should tell infected persons to isolate themselves for 4 days after rash onset and susceptible exposed persons should quarantine themselves for 21 days after exposure.
- Anyone suspected of having measles at the healthcare facility should be asked to wear a medical mask and immediately be placed in an airborne-infection isolation room (i.e. a negative air-pressure room) or if an airborne-infection isolation room is not available, the patient should be placed in a private room with the door closed and be asked to wear a mask. Airborne infection control precautions should be followed stringently.
- If a healthcare provider suspects measles, the provider should immediately contact the local health department where the patient resides. The provider should NOT wait for laboratory confirmation before reporting the suspect case.

If you need any additional information, please contact your local health department or visit the Ohio Department of Health website at www.odh.ohio.gov or the CDC website at www.cdc.gov.

Thank you for your support in protecting and improving the lives of Ohioans.

Sincerely,



Mary DiOrio, MD, MPH
State Epidemiologist
Medical Director, Division of Prevention and Health Promotion

Collection and Submission of Suspected Measles Specimens

Ohio Department of Health

When to collect measles specimens

- Detection of measles RNA and measles virus isolation are most successful when samples are collected on the **first day of rash through the 3 days following onset of rash**. Detection of measles RNA by RT-PCR may be successful as late as 10–14 days post rash onset.
- Specimens may be submitted at the discretion of the local health department after approval from ODH Vaccine Preventable Disease Epidemiology (614) 995-5599 to assist in describing their local measles outbreak. **Providers should call their local health department to initiate approval to ship to ODH Laboratory.**

How to collect measles specimens

Respiratory Swabs - Throat (oropharyngeal), nasal, or NP (nasopharyngeal) swabs are the preferred samples for virus isolation or detection of measles RNA by RT-PCR. Synthetic swabs are recommended. Throat, NP, or nasal swabs should be transferred to 1-3ml of *viral transport medium (do not allow to dry out).

- Insert a dry swab and allow swab to remain there for 15 seconds to absorb secretions.
- Rotate the swab gently 2-3 times and withdraw slowly.
- Place the swab in container with transport media, break off end of swab so that it fits in container.
- Label the container with patient name, date of collection, and type of specimen.

* Cell culture medium (minimal essential medium or Hanks' balanced salt solution) or other sterile isotonic solution (e.g. phosphate buffered saline) can be used. The presence of protein, for example 1% bovine albumin, 0.5% gelatin, or 2% serum, stabilizes the virus. Samples without a source of protein in the medium will lose 90%–99% infectivity within 2 hours at 4°C.

Serology (serum) samples - Collect 7–10 ml of blood in a red-top or serum-separator tube (SST) (5 ml of blood yields about 1.5 ml of serum).

- Do not freeze the tube before serum has been removed. Centrifuge the tube to separate serum from clot. Gel separation tubes should be centrifuged no later than 2 hours after collection. Aseptically transfer serum to a sterile tube that has an externally threaded cap with an o-ring seal.
- Capillary tubes can be utilized for infants. Capillary tubes require the submitter to have access to the appropriate centrifuge for these capillary tubes. Clinical laboratories should have 50 or 100 ul capillary tubes that are typically used for a variety of tests such as hematocrits or total lipids on newborns. At least 3 of the 50 ul hematocrit capillary tubes should be collected and spun in a hematocrit centrifuge.

Storage and shipment - Measles virus is sensitive to heat and infectivity decreases markedly when samples are not kept cold.

- Following collection, samples should be maintained at 4°C and shipped on cold packs (4°C) within 24 hours. If there is a delay in shipment, samples are best preserved by freezing at -70°C. Swab specimens should not be frozen in freezers set above -40°C. Previously frozen samples should be shipped on dry ice.
- Processing the swabs within 24 hours will enhance the sensitivity of both the RT-PCR and virus isolation techniques.

How to submit specimens to the Ohio Department of Health Laboratory

- Local Health Departments should call the ODH Bureau of Infectious Diseases at (614) 995-5599 between 8:00 am and 5:00 pm on weekdays for approval of specimen submission.
- For each specimen (fill out a separate form for each specimen) complete the following forms as completely as possible.
 - [Ohio Department of Health Laboratory Microbiology Specimen Submission Form](#)
 - Indicate “Measles Outbreak 2014” in the Comments section
 - [CDC Specimen Submission Form: Specimens of Human Origin \(CDC 50.34 HUMAN\)](#)
 - **Test order name: Measles Detection and Genotyping OR Measles Serology**
 - **Suspected agent: Measles Virus**
 - Forms with pre-filled fields are available at The Ohio Public Health Communication System (OPHCS)/Quick Links/Epidemiology Issues/2014 Measles):
- Place collected specimen and one frozen cold pack in a sealed plastic bag (or other watertight secondary packaging).
- Place sealed plastic bag and submission forms in a rigid third container, such as a fiberboard box.
- **Overnight shipment is preferred for receipt within 24 hours.** Specimens collected on a Friday should be frozen at **-40°C or lower** and shipped the following Monday (on dry ice). Follow protocols for standard interstate shipment of etiologic agents. All shipments must comply with current DOT/IATA regulations for Category B Biological Substances, as listed above.
- Mail package to the following address:
Ohio Department of Health Laboratory
Attn: Virology - Measles
8995 Main St., Building # 22
Reynoldsburg, OH 43068

If you have any questions please call the ODH Bureau of Infectious Diseases at (614) 995-5599.

