

Preventing Measles in Health Care Settings During an Outbreak

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BACKGROUND

Measles outbreaks are increasing in size and frequency around the world and cases presenting to healthcare settings can lead to resource intensive exposure investigations. This document provides evidence-based recommendations to minimize the risk of measles exposures and transmission within health care settings *during a measles outbreak*. It is intended for health care providers and facility managers at acute care and outpatient settings in New York City (NYC).

CLINICAL PRESENTATION

Measles typically presents in adults and children as an acute viral illness characterized by fever and generalized maculopapular rash. Signs and symptoms generally appear 7-21 days after initial exposure. The prodrome may include the three “C”s - cough, coryza, and conjunctivitis. Koplik’s spots (punctate blue-white spots on the buccal mucosa) are occasionally seen. The rash is red, maculopapular and usually starts on the face, proceeds down the body, may include the palms and soles, and appears discrete but may become confluent and lasts several days. A person who had some degree of immunity to measles prior to infection (e.g., babies <1 year who passively acquired some maternal antibody and previously vaccinated persons who had waning immunity) may have more mild symptoms or certain classic symptoms may be absent or atypical. Complications may include diarrhea, otitis media, pneumonia, hepatitis, encephalitis, and death. **Infected individuals are contagious from four days before rash onset through the fourth day after rash appearance (9 days total).**



[CDC Public Health Image Library](#)

TRANSMISSION AND INFECTION CONTROL

Measles is one of the most contagious of all infectious diseases; approximately 90% of susceptible persons in close contact with measles will develop the disease. The virus is transmitted by airborne particles, droplets, and direct contact with the respiratory secretions of an infected person and can live for up to two hours in an airspace where the infected person coughed or sneezed. Patients should be screened for measles at the point of entry into a healthcare facility (see below) and should be given a mask and placed on **airborne isolation** immediately (i.e., placed in a negative pressure room). If a negative pressure room is not available, place the patient in an exam room with a surgical mask and do not use that room for 2 hours after the patient has left. Only staff with documented immunity should have contact with the patient and any employee entering the room must wear a N95 respirator, regardless of immunity.

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HEALTHCARE EXPOSURE

For health care facilities, exposure is defined as any person who was in the same area of the facility [outside of an Airborne Infection Isolation Room (AIIR; i.e., negative pressure room)] as a measles patient for any length of time or were in these areas up to 2 hours after, regardless of surgical mask usage. Exposure is not defined by whether the case patient was wearing a surgical mask, but whether proper infection control measures were in place. Examples are provided below:

➤ **Meets exposure definition:**

- 1) An infectious patient *enters the facility*, was screened and given a mask and taken directly to a private room;
- 2) An infectious patient was wearing a surgical mask but remained in the waiting area or walked down a hallway that other patients used.

➤ **Does not meet exposure definition:**

A facility can confirm that a patient wore a surgical mask prior to entry into the facility and was taken directly to a negative pressure room.

REPORTING

Suspected cases of measles should be reported immediately to the New York City Health Department (347-396-2402/866-692-3641) at time of initial clinical suspicion. Do not wait for laboratory confirmation to report. If you are considering the diagnosis of measles and are ordering diagnostic testing, the patient should be appropriately isolated and reported at that time. The Health Department can arrange for rapid diagnostic testing (including viral PCR and serology) and provide guidance on managing potential exposures. ****When in doubt: Don't wait, Isolate!***

SUGGESTIONS FOR PREVENTING MEASLES TRANSMISSION DURING AN OUTBREAK

These suggestions can be applied to acute care facilities and outpatient settings that have seen suspected or confirmed measles cases or are in an area experiencing active measles transmission.

DISPLAY SIGNAGE

- ✓ Post signage outside your entrances instructing people with symptoms and risk factors, including rash, fever, international travel, or exposure to a person with measles, to inform staff before entering the facility. The signs should provide clear instructions on how to alert staff and include a phone number to call if needed.
 - Posters can be found on the [NYC Health Department Measles Provider page](#).
- ✓ Post similar signage in your waiting rooms, check in desks, elevators, etc.
- ✓ Have stations set up with surgical masks and hand sanitizer in the waiting areas near the signs for patients to put on themselves if they have fever/upper respiratory symptoms regardless of rash status.

IMPLEMENT SCREENING

- ✓ Consider stationing a greeter at the entrances to the facility to screen *all patients* upon entry for **fever and rash**.
If yes → mask patient, isolate, and then do risk assessment
 - If a surgical mask cannot be tolerated, implement other practical means of containment, e.g., place a blanket loosely over the head of infants or young children if measles is suspected (so as not to restrict breathing) while they are escorted to an isolation room.
- ✓ If a patient is reporting fevers (without rash), they should be screened for prodromal symptoms including the **3 Cs** (cough, coryza, conjunctivitis).
 - If screen is positive, ask about risk factors to determine whether measles needs to be considered
 - If patient reports any of the following risk factors → **mask patient and isolate**
 - International travel within 21 days
 - Domestic travel to an area experiencing a measles outbreak within 21 days
 - Any known contact with a measles patient

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- ✓ Screen those accompanying the suspected measles patient for early symptoms of illness and consider masking.
- ✓ Whenever possible, *place staff conducting screening outside of entryways* to identify potentially infectious patients before they enter the main ED space or waiting areas.
- ✓ If feasible and patient privacy can be protected, consider evaluating suspected measles patients outside, away from the entrance.
- ✓ Once a surgical mask is placed on the patient, ensure a clear path to the exam room and escort the patient into the building. The path should be cleared of patients prior to escorting the patient to the exam room and for 2 hours after the patient leaves.
- ✓ When admitting a febrile patient with rash and/or upper respiratory symptoms, do a second screen for measles to see if the patient needs to be isolated. Alert the inpatient team if measles is suspected and have a low threshold for placing in airborne isolation.

INCREASE STAFF AWARENESS

- ✓ Educate staff on what a classic measles rash looks like. Staff should also be aware that certain patients with partial immunity may have an atypical presentation (previously vaccinated adults, immunocompromised patients, infants <1yr).
 - Photos of measles rash are available [here](#).
- ✓ Ensure that all ED staff (including interns, residents and per diems) have been trained on your facility measles protocols and make sure the protocols are easily accessible to staff for reference (e.g., on intranet).
 - Staff should know whom they are expected to notify when there is a suspect case, both internally (e.g., ED manager, infection control, Infectious Diseases staff) and externally (NYC Health Department). Those contact numbers should be readily available.
- ✓ During each shift change, have a safety huddle and ensure that measles protocols are reviewed highlighting the key messages: *identify, isolate, inform*.
- ✓ Create a measles guidance page on your intranet or physical binders with needed information for providers, such as epi updates, infection control guidance, and [reporting information](#).
- ✓ Ensure that clinical staff are aware of and have access to the Citywide Immunization Registry (CIR) to look up Measles-Mumps-Rubella (MMR) vaccination history of suspected measles patients.
 - All facilities that serve pediatric patients should have access to the CIR, including hospitals and community health centers. Make sure all clinical staff are familiar with the CIR and how to access immunization records. The site administrator should provide accounts and training for additional staff that need it.
 - For facilities without a CIR account, information on accessing the registry can be found [here](#).

ENHANCE IDENTIFICATION OF HIGH-RISK PATIENTS

- ✓ If possible, work with your information technology department to enhance identification of at-risk patients through:
 - Adding screening questions in the electronic medical record with decision support tools on expected actions if any of the screening questions are positive
 - Creating an alert/flag for patients with home addresses in the affected ZIP codes if an outbreak is confined to specific neighborhoods
 - Placing a flag on the charts of patients with a known measles exposure including date of last exposure and incubation period. This can make it easier to identify high-risk patients, especially if they are presenting with prodromal symptoms but prior to rash onset
- ✓ Identify and flag patients who have not received their MMR on time and emphasize to your providers the importance of offering the vaccine during encounters/admissions.
 - See the [NYC Health Department Measles Provider page](#) for any outbreak-specific recommendations.

CONSIDER PATIENT MOVEMENT

- ✓ When transporting a patient within the facility, the patient should be wearing a surgical mask or implement another method of source control for patients unable to wear a mask (e.g., place a blanket loosely over the heads of infants and young children).

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- ✓ If transferring a patient or sending a patient to the ED with suspected or confirmed measles, ensure that the receiving facility/provider is informed of the diagnosis before the patient arrives so they can implement appropriate infection control measures.
- ✓ When discharging a patient with suspected measles, they should wear a mask and take a private vehicle if needed. *Public transportation should be avoided when potentially infectious.*

ENSURE EMPLOYEE HEALTH AND SAFETY

- ✓ Minimize the number of healthcare personnel interacting with suspect or confirmed patients.
- ✓ All health care personnel entering the room should wear a fit-tested N95 respirator (regardless of immunity status) or a respirator with similar effectiveness in preventing airborne transmission. Staff who are not immune should not care for measles patients.
 - If N95 or other airborne respirators are unavailable, health care staff should use a facemask.
- ✓ Work with employee/occupational health to ensure measles immunity of all staff, including contractors. Immunity must be verified by one of the following:
 - Written documentation of vaccination (i.e., 2 doses of a measles-containing vaccine or MMR vaccine administered at least 28 days apart); or
 - Laboratory evidence of immunity as indicated by a positive measles IgG titer; or
 - Laboratory confirmation of prior measles virus infection; or
 - Born prior to January 1, 1957; however, during an outbreak, it is recommended that these staff have serology drawn to confirm immunity status or receive MMR.¹

ADDITIONAL CONTROL MEASURES FOR OUTPATIENT FACILITIES IN AFFECTED NEIGHBORHOODS

- ✓ Add automated messaging about measles on your main phone line that patients hear before they come in or request an appointment.
- ✓ Pre-screen scheduled patients for measles immunity to flag patients that should be offered MMR vaccine during their visit.
- ✓ Urgently recall patients who are not up to date with MMR vaccination. Instructions for how to use the NYC Citywide Immunization Registry (CIR) to generate reminder and recall messages are available [here](#).
- ✓ Ask all families about planned international travel at each visit. Strongly recommend early MMR vaccination for infants 6-11 months of age who will be travelling internationally. Children and adults ages 12 months and older should receive two doses before international travel.
- ✓ When scheduling or calling patients to confirm appointments, screen susceptible patients (e.g., no/ unknown immunity, immune compromised, <1 year old, unvaccinated patients) for symptoms of measles including prodromal symptoms. If patients are reporting fevers, rash or any of the 3 Cs, consider the following measures to avoid exposures:
 - Schedule patients who are suspected of having measles after hours when other patients have gone home.
 - Instruct them to call upon arrival before entering the facility in order to be escorted in with a surgical mask and taken directly to a private room.
- ✓ If you are able, bring suspect patients in through alternative entrances so they don't walk through the waiting room; Some facilities have used separate clinic space without patients to screen suspect measles patients.
- ✓ See patients suspected of having measles outside if feasible (some providers have examined patients in the car or in a mobile clinic van).
- ✓ Conduct home visits to evaluate suspect measles patients, if feasible.

¹ For unvaccinated personnel born before 1957 who lack laboratory evidence of measles immunity or laboratory confirmation of disease, health-care facilities should recommend 2 doses of MMR vaccine during an outbreak of measles (source: ACIP <https://www.cdc.gov/mmwr/pdf/rr/rr6007.pdf>).

RESOURCES

- 1) **NYC Health Department general measles information page (updated weekly)**
<https://www1.nyc.gov/site/doh/health/health-topics/measles.page>
- 2) **NYC Health Department Measles Provider Resources including posters and additional guidance**
<https://www1.nyc.gov/site/doh/providers/health-topics/measles.page>
- 3) **NYC Health Department Health Alerts**
<https://www1.nyc.gov/site/doh/providers/resources/health-alert-network.page>
- 4) **CDC Clinical Overview of Measles for Health Care Providers**
<https://www.cdc.gov/measles/hcp/clinical-overview/>
- 5) **CDC Measles Vaccine Recommendations**
<https://www.cdc.gov/measles/hcp/vaccine-considerations/>
- 6) **Prevention of Measles, Rubella, Congenital Rubella Syndrome, and Mumps: Summary Recommendations of the Advisory Committee on Immunization Practices (2013)**
<https://www.cdc.gov/mmwr/pdf/rr/rr6204.pdf>
- 7) **Photos of measles**
<http://www.immunize.org/photos/measles-photos.asp>
- 8) **CDC Interim Infection Prevention and Control Recommendations for Measles in Healthcare Settings**
<https://www.cdc.gov/infection-control/hcp/measles/>
- 9) **CDC/HICPAC Guidelines for Environmental Infection Control in Health-Care Facilities**
Appendix B: Table B.1. Air changes/hour and time required for airborne-contaminant removal by efficiency and Table B.2. Ventilation requirements for areas affecting patient care in hospitals and outpatient facilities.
<https://www.cdc.gov/infection-control/hcp/environmental-control/appendix-b-air.html>
- 10) **CDC Global Measles Outbreaks Information**
<https://www.cdc.gov/global-measles-vaccination/data-research/global-measles-outbreaks/>