

Steps for Responding to Measles Exposures in Healthcare Settings

This document is intended for use in healthcare settings. It provides examples of how to implement a measles exposure investigation and can complement existing applicable law and public health department guidance. Refer to [Interim Infection Prevention and Control Recommendations for Measles in Healthcare Settings | Infection Control | CDC](#) for recommended practices when caring for a patient with suspected or confirmed measles. A [sample script](#) and [notification letter](#) are available to assist with notifying patients and visitors and assessing their eligibility for post-exposure prophylaxis.

Key Terms:

- **Definition of exposure to measles in healthcare settings:** Exposure to measles in a healthcare setting means spending any time while unprotected (i.e., not wearing recommended respiratory protection):
 - In a shared air space with an [infectious measles patient](#) at the same time, or
 - In a shared air space vacated by an infectious measles patient within the prior 2 hours*. See [Appendix A](#)

Measles is one of the most infectious known pathogens. Effectiveness of source control measures for measles has not been formally studied in healthcare settings. However, to date and based on available information, measles transmission has not been reported when a suspect measles patient is appropriately identified at entry, masked, and quickly transported to an airborne infection isolation room (AIIR); in such scenarios exposure risk is considered low, but is technically not zero.

*Measles has been reported to remain infectious in air for up to 2 hours. For spaces with a defined rate of air changes per hour (ACH), see the following for additional considerations about estimating the time for 99.9% removal efficiency of airborne contaminants: [Table B1 "Air changes/hour \(ACH\) and time required for airborne-contaminant removal by efficiency"](#) from the 2003 Guidelines for Environmental Infection Control in Health-Care Facilities.

- **Healthcare personnel (HCP):** Refers to all paid and unpaid persons serving in healthcare settings who have the potential for direct or indirect exposure to patients or infectious materials, including body substances (e.g., blood, tissue, and specific body fluids); contaminated medical supplies, devices, and equipment; contaminated environmental surfaces; or contaminated air. This includes, but is not limited to, physicians, nurses, nursing assistants, emergency medical service

personnel, phlebotomists, technicians, pharmacists, volunteers, and personnel not directly involved in patient care but who could be exposed to infectious agents (e.g., dietary, environmental services, laundry, volunteer personnel, among others)

- **Post-Exposure Prophylaxis (PEP):** The Advisory Committee on Immunization Practices (ACIP) [provides guidance](#) on use of measles PEP with Measles, Mumps and Rubella (MMR) vaccine and immunoglobulin (IG).
- **Presumptive Evidence of Immunity to Measles:** ACIP [provides guidance](#) on what is considered presumptive evidence of immunity (See Table 3).
- **Shared air space:** Refers to any space or room that shares a common air handling system. This can refer to smaller spaces such as a patient room or clinic waiting area or larger spaces or different areas in a larger space, such as a large emergency department with patient waiting, triage, HCP work areas, or multiple individual patient rooms that share a common unfiltered air source.
 - Other factors, such as humidity, ventilation parameters, and air flow dynamics between rooms also likely have an impact on efficiency of measles transmission.
 - Persons familiar with air handling in the facility such as a Heating, Ventilation and Air Conditioning (HVAC) engineer/technician, facility engineer, or maintenance technician can help with defining shared air spaces.

A shared air space is considered “**measles-contaminated**” if a patient with measles was in the space and [sufficient time](#) has **not** elapsed to remove 99.9% of airborne contaminants (see [Appendix B. Air](#) for more information).

- **Severe Immunocompromise:** Severely immunocompromised patients include, but are not limited to, patients with severe primary immunodeficiency; patients who have received a bone marrow 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; and 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/mm³ (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. The treating physician for the exposed individual should be consulted to determine if the patient is immunocompromised.

- **Source control:** Use of a well-fitting respirator without an exhalation valve or a well-fitting facemask to cover a person's mouth and nose to limit the spread of respiratory secretions when they are breathing, talking, sneezing or coughing. Source control devices should not be placed on children under age 2; anyone who cannot wear one safely, such as someone who has a disability or an underlying medical condition that precludes wearing one safely; or anyone who is unconscious, incapacitated, or otherwise unable to remove their source control device without assistance. Face shields alone are not recommended for source control.

Identify, Isolate, and Inform

- Promptly identify patients with suspected or confirmed measles.
- Immediately place well-fitting source control on the patient with suspected or confirmed measles. Take them directly to an Airborne Infection Isolation Room (AIIR).
 - Refer to [CDC guidance](#) if an AIIR is not available.
- Only healthcare personnel (HCP) wearing respiratory protection (i.e., a respirator) that is at least as protective as a fit-tested, NIOSH Approved® N95® filtering facepiece respirator should enter the patient room.
- Notify facility infection control personnel who can help with exposure management and notification of the health department.
- Perform necessary [measles diagnostic testing](#).
 - Measles diagnostic testing may take time to result. Given the short window to identify and administer PEP to susceptible persons after exposure, it is recommended that the steps described below be initiated even before measles is confirmed if measles testing results will not be available in a timely manner.

Exposure Management

- If the patient with measles is still in the facility or left the facility within the prior 2 hours, stop ongoing exposure:
 - To ensure that new persons are not exposed, when possible, close any areas known to be measles-contaminated airspaces for the [appropriate time \(up to 2 hours\) to allow for 99.9% of airborne-contaminant removal](#).
 - If this is not possible, then take actions (e.g., posted signage, person posted at the entrance to the space) to inform persons before entry into the space and minimize risk such as:
 - Healthcare Personnel

- HCP should wear a respirator that is at least as protective as a fit-tested, NIOSH Approved® N95® filtering facepiece respirator when entering the space, regardless of whether they have presumptive evidence of immunity to measles.
- Patients and Visitors
 - Restrict persons at high risk for severe disease (e.g. non-immune pregnant women, infants <12 months of age, severely immunocompromised) from entering these areas.
 - Inform patients and visitors who choose to enter the space that they will be considered exposed.
 - Offer them respirators to help minimize their risk
 - Use of a respirator by patients and visitors can help minimize their risk. However, not everyone is able to wear a respirator due to medical conditions that may be made worse when breathing through a respirator. Also, because they have not been fit-tested and properly trained, appropriate use should not be assumed, and they should still be considered exposed and managed accordingly.
 - Provide recommendations for daily monitoring.
 - Obtain contact information and information about presumptive evidence of immunity; and, if eligible, offer PEP. See **post-exposure prophylaxis (PEP) and monitoring of exposed persons** section for details.
- Identify the exposure risk time periods and shared air spaces based on the infectious period. (**See sample template**)
 - Look at the date(s) and times when the patient with measles was at the facility.
 - Identify all areas where the patient was present, including waiting rooms and triage areas.
 - Identify all room types (e.g. triage, open bay emergency room, inpatient or clinic room).
 - For non AIIR areas, define measles-contaminated air spaces by asking a facility engineer about the number of air changes per hour for each space, recirculation of air (e.g., including the percentage of outside air), direction of airflow, and where the air exhausts.
 - Note exact times the patient was present in each shared air space. To identify contacts in that air space, include those in the air space at the same time as the patient and for the 2 hours after the patient left (or [time it takes to achieve 99.9% air contaminant removal](#), if known).
- Create list of exposed HCP
 - Identify all HCP who were present in measles-contaminated air spaces during risk times.
 - Determine if these HCP were wearing recommended respiratory protection.

- HCP who were **not** wearing a respirator that is at least as protective as a fit-tested, NIOSH Approved® N95® filtering facepiece respirator are considered exposed, regardless of presumptive evidence of measles immunity status.
 - Evaluate all exposed HCP for [presumptive evidence of measles immunity](#).
 - Identify date of first and last exposure to measles for each exposed HCP.
 - Note type of exposures (e.g., distance from patient, duration, patient care activities, was patient masked during care, patient symptoms).
- Create list of exposed patients.
 - Identify all patients who were present in measles-contaminated air spaces during risk times.
 - For outpatient settings and procedure areas this will typically involve reviewing scheduling records.
 - Determine if exposed patients have [presumptive evidence of measles immunity](#).
 - This could involve review of medical records or asking patients directly.
 - Identify the date of first and last exposure to measles for each exposed patient.
 - Note type of exposures (e.g. distance from patient, duration).
- Create list of exposed visitors.
 - Identify all visitors who were present in measles-contaminated air spaces during risk times.
 - This could be available if sign-in sheets are used by the facility or, more likely, by asking the patient if anyone accompanied them while they were in the facility.
 - Determine if exposed visitors have [presumptive evidence of measles immunity](#).
 - This will likely involve asking visitors directly.
 - Note the date of first and last exposure to measles for each exposed visitor.
 - Note type of exposures (e.g. distance from patient, duration).

Post-exposure prophylaxis (PEP) and monitoring of exposed persons

- [Measles PEP](#) with MMR vaccine must be given within 72 hours of *first* exposure and PEP with IG must be given within 6 days of *first* exposure.
- Identify all exposed persons who belong to a [PEP-eligible group](#) for persons with:
 - No presumptive measles immunity
 - Unknown measles immunity

- Severe immunocompromise (regardless of previous presumptive evidence of immunity)
- Provide measles PEP to eligible exposed persons.
 - If PEP supply is limited (e.g. IG), develop a prioritization strategy of targeted groups such as: persons at high risk for severe disease (i.e., non-immune pregnant women, infants <12 months of age, severely immunocompromised), persons with presumed highest risk for infection (e.g., in a waiting room or patient care area with close and prolonged unprotected contact with a measles patient), and HCP without presumptive evidence of immunity to measles.
- All exposed persons, regardless of presumptive evidence of immunity or receipt of PEP, need a monitoring and/or exclusion plan.
 - Exposed HCP
 - *Nonimmune, unknown immunity, or severe immunocompromise*: Regardless of receipt of PEP, monitor daily for symptoms and **exclude from work** from the 5th day after their first exposure through the 21st day after their last exposure. If immune globulin (IG) was administered, extend monitoring to the 28th day after their last exposure, and consider extending work exclusion as well.
 - *Presumptive immunity or 1 previous dose of MMR vaccine*: Daily symptom monitoring **without work exclusion** from the 5th day after their first exposure through the 21st day after their last exposure. If only 1 MMR, [give a second dose per the Advisory Committee on Immunization Practices \(ACIP\) guidance](#). Work exclusion is not indicated unless exposed HCP develop signs or symptoms of measles.
 - Exposed hospitalized patients and long-term care residents
 - *Nonimmune, unknown immunity, or severe immunocompromise*: Regardless of receipt of PEP, move to a single-person AIIR and monitor symptoms from the 5th day after their first exposure through the 21st day after their last exposure or until discharge, if earlier. If IG was administered, extend monitoring duration to the 28th day after their last exposure and consider extending isolation as well.
 - If no AIIR is available, place the patient in a single room with door closed (if safe to do so) and consult with public health authorities for placement considerations. These might include transferring the patient to a facility with an AIIR or working with facility engineers to make a room negative pressure with air exhaust safely directed outside the facility.
 - *Presumptive immunity*: Daily symptom monitoring for 21 days after last exposure. Placement in an AIIR is not indicated unless the patient develops signs or symptoms of measles.
 - Exposed outpatients and visitors
 - Monitor as recommended by the public health department. Persons who are severely immunocompromised or do not have presumptive evidence of measles immunity and who seek care for any reason from the 5th day

after their first exposure through the 21st day after their last exposure should be cared for using Airborne Precautions. If IG was administered, extend monitoring duration to the 28th day after their last exposure, and consider extending Airborne Precautions if they seek care during this time period.

Public health notification and testing for exposed persons

- Notify the public health jurisdiction immediately if an exposed person develops symptoms, is tested, is confirmed to have measles, or is admitted to the hospital.
- If HCP develop symptoms of measles, they should be immediately excluded from work pending further evaluation.
- Provide the public health jurisdiction with regular updates during full monitoring period.
- Discuss specific scenarios that arise during the interaction with your health department.

Considerations for settings with limited response capacity

Contact tracing for measles can be time- and resource-intensive, involving a large number of potentially exposed persons. Complicating factors include:

- Initial symptoms often mimic other common respiratory infections
- Patients with measles may visit multiple healthcare facilities before being correctly diagnosed
- An affected healthcare facility might not be notified about an exposure until days after it occurred.

Whenever possible, efforts should be made to contact all exposed persons within the window to receive PEP. However, depending on timing and resources, it might only be feasible to focus on HCP and currently admitted patients or residents. Facilities might need to rely on broader outreach through the media or a facility alert advising anyone who was in specific areas of the facility (e.g., emergency department, cafeteria) during at-risk dates and times that they may have been exposed to measles and provide a website or number where people can get more information. Healthcare facilities should engage with their health department when exposures have occurred; health departments might be able to offer support for contact tracing efforts.

Sample template for healthcare settings to determine locations and times when measles exposures may have occurred

ID for Patient with Measles	Date	Day of Infectious Period*	Location(s)	Start Time	End Time	List Shared Air Spaces**	Exposure End Time (depending on air changes per hour, add up to 2 hours*** after “end time”)
12345	6/10/25	Day 0	Clinic waiting room	10:15	10:30	None	12:30
12345	6/10/25	Day 0	Clinic exam room 2	10:30	11:16	Nurses station, Physician charting area, Bathroom A, Exam rooms 4, 6, 8, 10	13:16

Instructions for use: Each row in the table should reflect the location where the patient with suspect or known measles was present before all recommended infection prevention and control measures were implemented. If more than one location was visited, then an additional row should be completed to account for potential differences in shared air spaces. To determine potential exposures, create lists of HCP, patients, and visitors that occupied the same location and the same shared air space as a patient with known measles (see blue columns) during the exposure time period (green). Those lists can then be used to gather additional details about the exposure and determine the need for PEP among exposed persons.

*Day of infectious period can range from 4 days before the day of rash onset (day 0) through the 4 days following rash onset.

**Considerations for defining a shared air space can be found, here: [Appendix A: Considerations when Evaluating a Person for Exposure to Measles in a Healthcare Setting | Infection Control | CDC](#). Healthcare facilities are encouraged to consult with facility engineers during contact investigations to define shared air space for their facility.

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Key:

Exposure Location(s)	
Exposure Time Period(s)	

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