

Guidelines to Airborne Precautions

The following information was obtained utilizing the CDC guidelines and information. If with additional information, you may find more information from the website:

<https://www.cdc.gov/>

DEFINITION

The CDC defines “Airborne Transmission” as indirect transmission or transfer of an infectious agent from a reservoir to a host by suspended air particles. Agents may be carried by dust or droplet nuclei suspended in the air. Airborne dust includes material that has settled on surfaces and become re-suspended by air currents as well as infectious particles blown from the soil by the wind. Droplet nuclei are dried residue of less than 5 microns in size. In contrast to droplets that fall to the ground within a few feet, droplet nuclei may remain suspended in the air for long periods of time and may be blown over great distances.

The more common microorganisms transmitted via airbourne include the Mycobacterium tuberculosis (TB), varicella (chickenpox virus), and the measles virus.

CDC currently identified (see table below) the following microorganisms associated with airborne transmission. Potential for airborne transmission increases with patients who are effective disseminators present in facilities with low relative humidity in the air and faulty ventilation. Also of note, when droplets are produced during a sneeze or cough, a cloud of infectious particles >5 µm in size is expelled, resulting in the potential exposure of susceptible persons within 3 feet of the source person. You will notice in the table below of examples of pathogens spread in this manner are influenza virus, rhinoviruses, adenoviruses, and respiratory syncytial virus (RSV). The table also may include Herpes-Zoster which is the reactivation of the Varicella Zoster virus.

Evidence for airborne transmission	Fungi	Bacteria	Viruses
Numerous reports in health-care facilities	Aspergillus spp.+ Mucorales (Rhizopus spp.)	Mycobacterium tuberculosis+	Measles (rubeola) virus Varicella-zoster virus
Occasional reports in health-care facilities (atypical)	Acremonium spp. Fusarium spp. Pseudoallescheria boydii Scedosporium spp. Sporothrix cyanescens¶	Acinetobacter spp. Bacillus spp.¶ Brucella spp.** Staphylococcus aureus ^{148, 156} Group A Streptococcus	Smallpox virus (variola)§ Influenza viruses Respiratory syncytial virus Adenoviruses Norwalk-like virus
No reports in health-care facilities; known to be airborne outside.	Coccidioides immitis ¹²⁵ Cryptococcus spp. ¹²¹ Histoplasma capsulatum ¹²⁴	Coxiella burnetii (Q fever) ²¹²	Hantaviruses ^{193, 195} Lassa virus ²⁰⁵ Marburg virus ²⁰⁵ Ebola virus† ²⁰⁵

			Crimean-Congo virus ²⁰⁵
Under investigation	Pneumocystis carinii ¹³¹	n/a	n/a

* This list excludes microorganisms transmitted from aerosols derived from water.

+ Refer to the text for references for these disease agents.

§ Airborne transmission of smallpox is infrequent. Potential for airborne transmission increases with patients who are effective disseminators present in facilities with low relative humidity in the air and faulty ventilation.

¶ Documentation of pseudoepidemic during construction.

** Airborne transmission documented in the laboratory but not in patient-care areas.

† The recommendations in this guideline for Ebola Virus Disease has been superseded on August 1, 2014.

PROCEDURE

FOR STAFF

GENERAL GUIDELINES

- Whenever possible, non-immune healthcare workers (HCWs) should not care for patients with vaccine-preventable airborne diseases (e.g., measles, chickenpox, and smallpox).
- Restrict persons who are considered to be in a high-risk group for severe illness and complications from include severely immunocompromised persons, infants too young to be vaccinated, and pregnant women who do not have presumptive evidence
- As mentioned above, droplet nuclei may remain suspended in the air for long periods of time and may be transported over long distances. Thus eventually, individuals diagnosed with current airborne confirmed microorganisms should be treated in a facility that provides an airborne infection isolation room (AIIR). An AIIR is a single-patient room that is equipped with special air handling and ventilation capacity that meet the American Institute of Architects/Facility Guidelines Institute (AIA/FGI) standards for AIIRs i.e.:
 1. Monitored negative pressure relative to the surrounding area
 2. 12 air exchanges per hour for new construction and renovation and 6 air exchanges per hour for existing facilities
 3. Air exhausted directly to the outside or re-circulated through HEPA filtration before return)
- Although Transmission-Based Precautions generally apply in all healthcare settings, exceptions exist. For example, in home care, AIIRs are not available. Furthermore, family members already exposed to diseases such as varicella and tuberculosis may not be utilizing masks or respiratory protection, but visiting HCWs would need to use such protection.

- Discontinuation of Transmission- Based Precautions
 - Per CDC, for most infectious diseases, the duration reflects known patterns of persistence and shedding of infectious agents associated with the natural history of the infectious process and its treatment.
 - For some diseases (e.g., pharyngeal or cutaneous diphtheria, RSV), Transmission-Based Precautions remain in effect until culture or antigen-detection test results document eradication of the pathogen and, for RSV, symptomatic disease is resolved.
 - For other diseases, (e.g., *M. tuberculosis*) state laws and regulations, and healthcare facility policies, may dictate the duration of precautions.

Managing your visit

A. General guidelines

- a. Follow personal protective equipment (PPE) outlined below
- b. Staff should implement appropriate hand hygiene protocol
- c. For patients with skin lesions associated with varicella or smallpox or draining skin lesions caused by *M. tuberculosis*, cover the affected areas to prevent aerosolization or contact with the infectious agent in skin lesions
- d. It is part of the employee's responsibilities to inform agency of possible acquired disease transmitted via airborne route
- e. HCWs who provide medical services in the homes of patients should not perform cough-inducing or aerosol-generating procedures on patients with suspected or confirmed infectious TB disease, because recommended infection controls probably will not be in place. Sputum collection should be performed outdoors, away from other persons, windows, and ventilation intakes.

B. Pre-visit

- a. Schedule appointments via phone
- b. Collaborate with patient/ patient caregiver and discuss the following
 - i. What symptoms patient may be experiencing? Any emergent actions required?
 - ii. Household members which may be affected?
 - iii. Discussing relevant infection control expectations
- c. Implementing source control.
 - i. Affected persons with signs or symptoms of an airborne transmitted microorganism should be identified, provided a facemask to wear, and separated from other members of household (if possible). Having the door closed of the affected room.
 - ii. Discuss patient options for room-sharing (e.g., cohorting patients with the same infection)
 - iii. However, assume that members of household may also be exposed and educate on strict respiratory hygiene/ cough etiquette.
 - iv. Educate patients and other household members regarding the importance of taking medications as prescribed
 - v. Clean high frequency touched items utilizing appropriate EPA-registered disinfectant
 - vi. Having a trashcan outside near entrance of home to dispose of PPE
 - vii. Limit visitors into the home

- viii. For TB, no infants and children aged <4 years or persons with immunocompromising conditions are present in the household

C. Personal Protective Equipment (PPE)

1. Consider the disease-specific recommendation.
2. However, wear a fit-tested NIOSH-approved N95 or higher level respiratory for respiratory protection when entering the room or home of a patient when the following disease are suspected or confirmed
 - a. Infectious pulmonary or laryngeal tuberculosis or when infectious tuberculosis skin lesions are present and procedures that would aerosolize viable organisms (e.g., irrigation, incision and drainage, whirlpool treatments) are performed
 - b. Smallpox (vaccinated and unvaccinated). Respiratory protection is recommended for all healthcare personnel, including those with a documented “take” after smallpox vaccination due to the risk of a genetically engineered virus against which the vaccine may not provide protection, or of exposure to a very large viral load (e.g., from high-risk aerosol-generating procedures, immunocompromised patients, hemorrhagic or flat smallpox
 - c. For ~ Suspected measles, chickenpox or disseminated zoster.
 - i. Currently CDC has no recommendation is made regarding the use of PPE by healthcare personnel who are presumed to be immune to measles (rubeola) or varicella-zoster based on history of disease, vaccine, or serologic testing when caring for an individual with known or suspected measles, chickenpox or disseminated zoster, due to difficulties in establishing definite immunity
 - ii. CDC also currently has no recommendation is made regarding the type of personal protective equipment ((i.e., surgical mask or respiratory protection with a N95 or higher respirator) to be worn by susceptible healthcare personnel who must have contact with patients with known or suspected measles, chickenpox or disseminated herpes zoster.
 - iii. Because of the above following, the agency recommends that Healthcare personnel should use respiratory protection that is at least as protective as a fit-tested NIOSH-certified disposable N95 filtering face piece respirator, regardless of presumptive evidence of immunity, upon entry to the room/ home/ facility or care of a patient with known or suspected airborne transmitted microorganism.
3. Respirator use must be in the context of a complete respiratory protection program in accordance with Occupational Safety and Health Administration (OSHA) [Respiratory Protection Standard 29 CFR 1910.134](#)[external icon](#).
 - HCP should be medically cleared and fit-tested if using respirators with tight-fitting face pieces (e.g., a NIOSH-certified disposable N95) and trained in the proper use of respirators, safe removal and disposal, and medical contraindications to respirator use.
 - Consider N95 or higher level respirators or masks if respirators are not available for healthcare personnel will reduce the likelihood of airborne

transmission until the patient is either transferred to a facility with an AIIR or until further doctor orders

- Appropriate masks should be donned prior to house/ facility entry
 - b. Implement standard precautions such as wearing appropriate gloves, gown, face and eye protection
 - c. Follow CDC protocol for when/ how to don/ doff of PPE
 - d. Clean re-use items according to manufacturer instructions and dispose of single-use items appropriately
- B. Establish Reporting within hospitals and to public Health authorities
- a. Consider the following especially for diseases that are susceptible to outbreaks such as Measles, etc.
 - b. Implement mechanisms and policies that promptly alert key facility staff, including hospital leadership, infection control, healthcare epidemiology, occupational health, clinical laboratory, and frontline staff, about patients with suspected or known measles.
 - c. Communicate and collaborate with public health authorities
 - d. When emergency medical services are alerted to fully endorse situation regarding possible airborne microorganism in the home
 - e. Promptly notify public health authorities of patients with known or suspected measles.
 - f. Designate specific persons within the facility who are responsible for:
 - i. Communication with public health officials, and
 - ii. Dissemination of information to HCP.
- Documentation of the routes of exposure and circumstances under which the exposure occurred.
 - Results of the clinical laboratory values if available or needed
 - All medical records relevant to the appropriate treatment of the employee including vaccination status.
1. Returning to work
- Agency will utilize administrative discretion and CDC disease specific recommendations in regards to discontinuation of transmission based status and returning to work