

## AIRBORNE PRECAUTIONS PROCEDURES

### Supplement to University of Colorado Hospital Policies and Procedure: *Isolation/Transmission Based Precautions*

#### **Parent Policy:** Isolation/Transmission Based Precautions

**Authority:** Authority for enactment/implementation and enforcement of compliance with behaviors, procedures and actions described in this document is derived from the status of its parent policy *Isolation/Transmission Based Precautions* as an official hospital policy with appropriate approvals as posted on the University of Colorado Hospital (UCH) intranet.

**Revised:** 8/6/2014

**Guiding Principle:** Isolation is a patient safety tool comprised of specific patient management protocols designed to prevent spread of certain significant infectious organisms in a healthcare facility. As such, it is driven by hospital policy and based on evidence of the presence of patient infection/colonization with one of these specific organisms. See Appendix A for a comprehensive and inclusive listing of all identified potentially infectious conditions and the appropriate precautions to be applied per Centers for Disease Control (CDC) recommendations. Removal of a patient from isolation will be based on “duration of precautions” information contained in Appendix A and/or evidence that the patient is not infected or colonized with the organism (diagnosis ruled out).

***A physician order is not required to initiate or discontinue Airborne Precautions. However, Airborne Precautions should always be initiated in response to certain physician diagnoses or orders such as “R/O TB” or “AFB x 3”.***

**Description:** This document contains written procedures describing expected behaviors of patients and staff and actions to be taken when a patient is placed in Airborne Precautions at University of Colorado Hospital.

**Accountability:** All University of Colorado Hospital (UCH) employees, physicians, students, contract employees and volunteers are responsible for correct implementation of these procedures. Physicians and advanced clinicians are responsible for identification/diagnosis of the organism/condition that may require isolation. Based on the diagnosis and/or identification of the relevant organism/condition, UCH clinical staff are responsible for implementation of the appropriate isolation precautions according to information contained in Appendices A, A.1 and A.2 referenced below. UCH clinical staff are responsible for the education of visitors and others as to appropriate apparel and behavior in the patient care setting.

Personnel with patient contact or who enter patient rooms in the performance of their duties must be evaluated by Employee Health for ability to wear, fitting and training in the correct use of N-95 respirators or training in the use of a power air purifying respirator (PAPR). It is the responsibility of personnel to use the appropriate size N-95

correctly (Employee Health has record of size for those who have been fitted at UCH). It is the responsibility of UCH to provide adequate stocks of appropriate (type and sizes) PPE in the work setting. It is the responsibility of UCH department directors and managers to assure that employees at risk for exposure to diseases/conditions transmitted by the airborne route are evaluated by Employee Health and provide appropriate PPE for them.

## **RELATED DOCUMENTS AND TOOLS for Implementation**

### **PARENT POLICY**

- *ISOLATION/TRANSMISSION BASED PRECAUTIONS – HUB > Policies and Procedures > Infection Control > Isolation/Transmission Based Precautions*

### **TABLES and ILLUSTRATIONS**

- TABLE – TYPE AND DURATION OF PRECAUTIONS NEEDED FOR SELECTED INFECTIONS AND CONDITIONS – APPENDIX A
- TABLE – INPATIENT ISOLATION SPECIFICATION TABLE – APPENDIX A.1
- TABLE – AMBULATORY (OUTPATIENT) ISOLATION SPECIFICATION TABLE – APPENDIX A.2
- AIRBORNE PRECAUTIONS SIGN PICTURE – APPENDIX B.1
- SAFE DORNING AND REMOVAL OF PERSONAL PROTECTIVE EQUIPMENT (PPE) – APPENDIX B.3

### **FACT SHEETS FOR HEALTH CARE WORKERS**

- TUBERCULOSIS FACT SHEET – APPENDIX B.2

## **CONTENTS OF PROCEDURE**

- I. Definitions
- II. Requirements/procedures to follow
- III. Patient Management – detailed instructions
  - A. Identification of Patient Requiring Airborne Precautions
  - B. Immediate Action(s) Upon Identification in the Outpatient Setting or Prior to Appropriate Inpatient Placement
  - C. Inpatient Placement
  - D. Hazard Communication – signs and documentation
  - E. Negative Air Pressure Systems
  - F. Respiratory Protection
  - G. Required Wearing of N-95 or PAPR
  - H. Hand Hygiene
  - I. Gloves
  - J. Patient Transport
  - K. Dishware and Eating Utensils
  - L. Patient Care Equipment and Supplies
  - M. Linen
  - N. Waste
  - O. Handling of Specimens and Deceased Persons with Airborne Diseases
  - P. Admissions

- Q. Patients with Pulmonary TB or History of Pulmonary TB Undergoing Surgical Procedures
- R. Isolation Discontinuation
- S. Visitors and PPE
- T. Patient/Family/Visitors Education
- U. Reporting of Disease(s)/Condition(s) to Public Health Officials

### **I. Definitions:**

For the purpose of this procedure, the following definitions apply:

- A. *Isolation/Transmission based precautions*: Systems of specific activities based on identified modes of transmission designed to contain and/or prevent transfer of organisms from a source (patient and/or environment) to a susceptible host (patient, health care provider, visitor, etc.).
- B. *Airborne Precautions*: A patient management system designed specifically to prevent spread of identified/known organisms transmitted by the airborne route from infected sources to vulnerable host recipients.

### **II. REQUIREMENTS/PROCEDURES TO FOLLOW**

- A. *Goal*: Prevention of organism spread and transmission of disease
- B. *Strategy/Tactics*:
  1. Containment of communicable organism(s) within certain prescribed boundaries, such as the patient him/herself and/or the patient room.
  2. Removal of the organism from the patient room through specialized HVAC engineering.
  3. Protection of vulnerable individuals entering the patient room through utilization of specialized respiratory protective devices.

### **III. PATIENT MANAGEMENT – detailed instructions:**

- A. *Identification of Patient Requiring Airborne Precautions*: Suspected/Confirmed to have active disease caused by *Mycobacterium tuberculosis* (MTb or Tb), *rubeola* virus (measles), *varicella zoster* virus (chicken pox, disseminated shingles), *variola* virus (smallpox), or Severe Acute Respiratory Syndrome (SARS).
  1. Physician diagnosis or written order based on symptomatology – “R/O Tb”, “R/O measles”, “R/O chicken pox/varicella”, “R/O smallpox/variola”, “R/O SARS”.
  2. Physician written order AFB cultures
    - a. For evaluation of MTb, it is required that three AFB smears/cultures be collected greater than four hours apart. This should include one morning specimen.
      - i. If an expectorated or induced sample cannot be obtained, one AFB smear/culture from a BAL is acceptable.
    - b. **EXCEPTION**: When an order for an AFB culture is written on a patient with known nontuberculous mycobacterium (e.g., MAC or MAI) or a cystic fibrosis patient, airborne precautions are not required unless the physician indicates that tuberculosis is suspected.

3. Physician order for Quantiferon testing in the presence of signs or symptoms of active tuberculosis (such as cavitory lung lesions, weight loss, night sweats, hemoptysis, etc.).
- B. Immediate Action(s) Upon Identification in the Outpatient Setting or Prior to Appropriate Inpatient Placement (described in 3. below):
1. Apply surgical (with ties) or procedure/isolation (with ear loops) mask to patient if not housed in a room with negative pressure (containment of large particles produced by cough). DO NOT put N-95 respirator (mask) on patient. Do NOT put N-95 mask on anyone who has not been fitted for wearing N-95 (most likely family/others accompanying patient).
  2. Assure patient is in a private exam or procedure room if no negative pressure rooms available – keep door closed while patient in room.
  3. If patient cannot appropriately wear surgical mask, N-95 respirator or PAPR must be worn by personnel entering room, performing testing or procedures on, or transporting patient – see permissible exceptions in Section 7. below.
  4. Outpatient departments performing diagnostic testing and procedures must provide adequate stocks of appropriate (type and sizes) PPE in the work setting.
- C. Inpatient Placement:
1. **Private** room that has
    - a. Monitored negative air pressure in relation to the surrounding areas
    - b. At least six to 12 air changes per hour
    - c. Discharge of air outdoors and/or through HEPA filters.
  2. Keep the room door **closed** and the patient in the room.
  3. When a private room is not available, place the patient in a room with a patient who has active infection with the same microorganism, unless otherwise recommended, but with no other infection.
  4. When a private room is not available and cohorting is not desirable, consultation with Infection Control (pager 303-266-2927) is advised before patient placement.
  5. Upon discharge or transfer of the suspected or confirmed active TB patient, respiratory protection must be worn by all persons entering the vacant negative pressure room within one half hour (30 minutes) of the patient's exit from the room.
- D. Hazard Communication – signs and documentation:
1. Post RED Airborne Precautions sign (Appendix B.1) on room door or in adjacent wall slot.
  2. Note “Airborne Precautions” in/on all requests to other departments for patient services.
  3. Include “Airborne Precautions” verbiage in hand-off communications to all others assuming care of the patient.
  4. On patient care units that use Care Manager, enter “Airborne Precautions” into Infection Control NIC in patient record nursing notes.
  5. On patient care units that do not use Care Manager, enter “Airborne Precautions” in patient record at appropriate documentation site.

E. Negative Air Pressure Systems – Locations: Listed below. Whenever a patient is placed on Airborne Precautions in any of these rooms, unit staff must notify UCH Engineering Department (8-8351) to activate the audible pressure alarm system for that room.

1. **Anschutz Outpatient Pavilion:**

- a. 1<sup>st</sup> Floor - Pain Clinic room 1112
- b. 2<sup>nd</sup> Floor - PACU rooms 2114, 2121 and 2124
- c. 3<sup>rd</sup> Floor - OBGYN Clinic room 3207
- d. 4<sup>th</sup> Floor - Rheumatology Asthma Allergy Clinic room 4640
- e. 5<sup>th</sup> Floor - Internal Medicine Clinic room 5103
- f. 6<sup>th</sup> Floor - Ear Nose Throat Clinic room 6308
- g. 7<sup>th</sup> Floor – Transplant Clinic room 7113; Pulmonary Function Lab room 7211; Sub-Specialty Clinic room 7240; Infectious Disease Clinic room 7248; and OIC rooms 7283.1 and 7283.9.

2. **Anschutz Inpatient Pavilion:**

- a. 1<sup>st</sup> Floor former Emergency Department - 1.037.10, 1.048.22, 1.048.30 and 1.048.36
- b. 2<sup>nd</sup> Floor THRU (former Medical Intensive Care Unit) – 203, 208, 215. (Positive pressure rooms 205, 206 – do not use for R/O TB patients)
- c. 4<sup>th</sup> Floor – LDR rooms 404 and 420
- d. 5<sup>th</sup> Floor – 514
- e. 6<sup>th</sup> Floor – 603, 617, 620 and 634
- f. 7<sup>th</sup> Floor – 701, 735 and 736
- g. 8<sup>th</sup> Floor – 801, 818, 819 and 832
- h. 9<sup>th</sup> Floor – all rooms 901 through 909; 919 and 936
- i. 10<sup>th</sup> Floor – 1001, 1008, 1016, 1021 and 1032
- j. 11<sup>th</sup> Floor – 1101, 1102 and 1128.

3. **Critical Care Extension/Wing:**

- a. 1<sup>st</sup> Floor – Dialysis rooms 5 and 6
- b. 2<sup>nd</sup> Floor – PACU rooms 18 and 42. SICU Rooms 229 and 234
- c. 3<sup>rd</sup> Floor – BICU Room 325. Cardiac and Vascular Center – Rooms 1, 2, 10, 38, 39 and Bronchoscopy Suite
- d. 4<sup>th</sup> Floor – NICU Rooms 451 and 453.

4. **Anschutz Inpatient Pavilion 2:**

- a. 1<sup>st</sup> Floor – Emergency Department rooms 23, 24, 62 and 63
- b. 2<sup>nd</sup> Floor – NSICU room 279 and PACU rooms 1, 12 and 35
- c. 3<sup>rd</sup> Floor – CICU/CPCU room 356
- d. 9<sup>th</sup> Floor – MSSU rooms 952 and 983
- e. 10<sup>th</sup> Floor – MICU rooms 1060, 1070, 1075 and 1079
- f. 11<sup>th</sup> Floor – OMGU rooms 1152 and 1183

F. Respiratory Protection:

1. **N-95 Disposable Respirator:**

- a. All *care providers* (anyone who provides direct care and/or a service for the patient – includes but not limited to admission personnel, insurance verifiers, housekeepers, food service providers, social

workers, case managers) shall be fit-tested for an N-95 disposable respirator during pre-hire health assessment by Employee Health.

- b. Wear the N95 respirator mask size for which you were fitted when entering the room of a patient with known or suspected infectious pulmonary tuberculosis.
  - c. Susceptible persons should not enter the room of patients known or suspected to have measles (rubeola) or varicella (chickenpox) if other immune caregivers are available. If susceptible persons must enter the room of a patient known or suspected to have measles (rubeola) or varicella, they should wear respiratory protection (N-95 mask).
  - d. Persons with known immunity to measles (rubeola) or varicella (chickenpox) need not wear respiratory protection.
2. **PAPR – Powered Air Purifying Respirator:**
- a. Clinical care providers who have facial hair or whose facial contours do not allow an N-95 disposable respirator to “seal” to the face to provide adequate respiratory protection must wear a PAPR. Most PAPRs consist of a clear-plastic-windowed hood covering the head and shoulders connected by a hose to a small battery powered HEPA filtered motor unit that provides filtered air to the hood interior.
  - b. All clinical care providers who cannot wear an N-95 disposable respirator should report to Employee Health to be familiarized with PAPR use.
  - c. PAPRs are provided to clinical units with care providers needing this type of protection to care for Airborne Precautions patients by the Respiratory Therapy Department. **To obtain a PAPR contact the Respiratory lead therapist at 8-4925.** Inability to appropriately wear a particulate N-95 disposable respirator is not a valid reason for staff reassignments – adequate respiratory protection is available and should be used appropriately.

G. Required Wearing of N-95 or PAPR:

1. **DO NOT PLACE N95 MASKS ON PATIENTS. USE SURGICAL (with ties) OR PROCEDURE/ISOLATION (with ear loops) MASKS ON THE SUSPECTED OR CONFIRMED Tb, MEASLES, CHICKENPOX OR INFLUENZA PATIENT.**
2. Before entering and while in the room of a patient, living or deceased, with known or suspected infectious tuberculosis, and if not immune to measles (rubeola) or varicella (chickenpox).
3. While performing high risk procedures for any patient on airborne precautions requiring a negative air pressure room (i.e., MTb) such as pentamidine treatments, bronchoscopies, sputum inductions, intubations, surgery, autopsies, suctioning, etc.
4. At any time any provider is in the presence of an unmasked known or suspected Tb patient inside a building. Wearing of N95 respiratory protection in the presence of a masked known or suspected Tb patient will provide protection for the provider if/when the patient is unable to wear a surgical mask correctly or removes it unexpectedly during a procedure or interaction.

5. At any time a susceptible (non-immune) provider is in the presence of a patient with suspected or confirmed active measles, chickenpox, or disseminated varicella inside a building. Wearing of N95 respiratory protection in the presence of a masked known or suspected measles, chickenpox or disseminated varicella patient will provide protection for the non-immune provider if/when the patient is unable to wear a surgical mask correctly or removes it unexpectedly during a procedure or interaction.
  6. Respiratory Protection must be worn to enter the vacant negative pressure patient room within ½ hour (30 minutes) following discharge or transfer of the suspected or confirmed active Tb patient.
- H. Hand Hygiene: Per University of Colorado Hospital Policy and Procedure: Hand Hygiene – Outside the Surgical Setting and University of Colorado Hospital Policy and Procedure: Standard Precautions.
- I. Gloves: Per University of Colorado Hospital Policy and Procedure: Standard Precautions.
- J. Patient Transport:
1. Essential transport only. Only move the patient from the negative pressure room if absolutely necessary.
  2. Suspected or confirmed TB patient
    - a. If transport or movement is necessary, the **patient must wear a surgical or procedure/isolation** mask at all times while outside the negative pressure room. **DO NOT PUT N95 MASK ON PATIENT.**
    - b. A surgical mask must be placed on the patient prior to exiting the isolation room, and the patient must remain masked at all times while outside the negative pressure room. Upon exiting the room, the transporter may remove the N95 respirator and must perform hand hygiene.
    - c. Inform receiving department of necessary airborne precautions (patient must be treated in a negative pressure room or remain masked).
    - d. If patient unable to wear surgical mask, transporters must wear N95 mask. Public corridors should be avoided during transport. Unmasked persons should not be allowed to occupy the same elevator as the unmasked patient during transport.
    - e. The patient chart should be placed in a clear plastic (patient belongings) bag for transport.
  3. Chickenpox or Measles patient.
    - a. Only transporters who are immune to chickenpox or measles may be assigned to assist these patients. Check with Employee Health for immune status.
    - b. A surgical mask must be placed on the patient prior to exiting the isolation room, and the patient must remain masked at all times while outside the negative pressure room.
    - c. The patient chart should be placed in a clear plastic (patient belongings) bag for transport.

- d. Inform the receiving department of necessary airborne precautions (patient must be treated in a negative pressure room or remain masked while in the receiving department).
- K. Dishware and Eating Utensils:
1. Disposable tray NOT required. These organisms are not considered environmental contaminants (see Contact Precautions Procedures – Definitions).
  2. No special precautions for dishes, glassware or eating utensils.
  3. Cleaning and disinfection of dishes and utensils will occur in the dishwasher prior to use by another patient.
- L. Patient Care Equipment and Supplies:
1. If possible, use disposables supplies on all patients, whether or not in isolation.
  2. Clean and disinfect all reusable equipment prior to use on another patient.
  3. Reusable equipment, such as IV pumps, obtained from Central Supply (CS), will undergo disinfection by CS personnel prior to use on another patient.
- M. Linens: No special precautions. See *University of Colorado Hospital Policy and Procedure: Linen* for guidelines.
- N. Waste: No special precautions unless :
1. Contaminated with blood/body fluids – see University of Colorado Hospital Policy and Procedure: *Infectious/Regulated Waste Management* for guidelines.
  2. Chemotherapy or cytotoxic waste – see University of Colorado Hospital *Hazardous Waste Management Plan* for guidelines.
  3. Radioactive waste – see University of Colorado Hospital: *Hazardous Waste Management Plan* for guidelines.
  4. Pharmaceutical waste – see University of Colorado Hospital *Hazardous Waste Management Plan* for guidelines.
- O. Handling of Specimens and Deceased Persons with Airborne Diseases:
1. Place specimens in a leak-proof package.
  2. All specimen containers/packages shall be checked by specimen transporter to be sure they are appropriately sealed prior to transport.
  3. Microbiology personnel process specimen by doing initial plating under a biosafety hood.
  4. Personnel preparing a body for transport to the morgue will place body in a zippered body bag. Morgue personnel will not handle body until the chart of the deceased has been reviewed for airborne diseases and the appropriate precautions have been initiated.
  5. Surgical pathology: Specimen received from the OR is to be labeled with airborne precaution sticker. Specimen is placed in a covered closed container that is bagged. Specimen is processed under a biosafety hood in the frozen section room.
- P. Admissions:
1. Elective Admissions: The admitting physician is responsible for arranging for appropriate isolation for patients needing airborne precautions. **PATIENTS MAY NOT BE ADMITTED ELECTIVELY WITHOUT ASSURANCE**



**THAT AN APPROPRIATE ROOM IS AVAILABLE, AS CONFIRMED BY BED CONTROL (pager 303-266-8262).**

2. Non-Elective Admissions: The receiving primary medical team must arrange for appropriate isolation of patient with infectious or potentially infectious airborne disease admitted through the emergency room or referred emergently from another institution.
- Q. Patients with Pulmonary TB or History of Pulmonary TB Undergoing Surgical Procedures:
1. Patients transferred from an outside hospital with a diagnosis of active pulmonary TB or a remote history of treated pulmonary TB are to be placed in airborne precautions. This should continue until:
    - a. Infection Control and/or Infectious Diseases can review results of previous AFB smears/cultures as well as documentation of previous treatment history.
    - b. If confirmation from an outside facility is not available or the patient undergoes a thoracic surgery (i.e. pneumonectomy, lobectomy or wedge resection) then the patient should continue in airborne precautions and AFB smears/cultures should be collected as below (under 18. a.).
      - a. In addition to results of AFB smears/culture, the duration of airborne precautions is dependent on patient symptoms, imaging and duration of treatment. Infectious Diseases consultation is strongly encouraged.
- R. Discontinuation of airborne precautions for patients being evaluated for TB:
1. In patient whom clinical suspicion for TB is low (absence of symptoms of pulmonary TB or cavitory lesions/fibronodular upper lobe infiltrates or scarring/hilar lymphadenopathy on imaging or absence of risk factors including birth in a country where TB is endemic, immunocompromised including HIV, history of incarceration or homelessness, new positive quantiferon or TST, etc):
    - a. Airborne precautions may be discontinued if three AFB smears collected greater than four hours apart are negative, this should include one morning specimen.
    - b. If expectorated or induced samples cannot be obtained, one AFB smear from a BAL is acceptable as repeating an invasive procedure (i.e. bronchoscopy) three times is not feasible. The sensitivity of a BAL specimen for AFB is not better than a sputum specimen.
  2. In patients whom the clinical suspicion for TB is moderate-high
    - a. Airborne precautions should be continued even if the patient has negative AFB smears.
    - b. Consultation with Infectious Diseases for consideration of cultures from additional sites and guidance regarding empiric TB therapy is RECOMMENDED if an alternative diagnosis cannot be clearly established.
  3. The Infection Prevention Care team (pager 303.266.2927) has the final authority regarding discontinuation of airborne precautions. Many factors are

considered in the infectiousness of a patient besides AFB smear including presence of a cough, cavity in the lung, and duration on adequate TB therapy.

4. If the patient is discharged from the hospital with a suspected or confirmed diagnosis of tuberculosis further isolation will be directed by the public health authorities.
    - a. The Infection Prevention Care team will work in conjunction with public health authorities if a contact investigation is deemed necessary.
- S. Visitors and PPE:
1. Visitors may or may not be required to wear masks or respiratory protection on an individual basis according to:
    - a. Visitor's chickenpox/measles immune status
    - b. Amount and intensity of pre-admission exposure to patient in the case of suspected or confirmed TB
- T. Patient/Family/Visitor Education:
1. Provide patients and families of patients in airborne precautions with written patient education handouts concerning Airborne Precautions to reinforce verbal communications of behavioral expectations while in isolation. Airborne Precautions Information for Patients and Families handouts are available in Micromedex® Care Notes® on the UCH HUB website. Document education of patient/family and distribution of Airborne Precautions handout in nursing notes.
  2. Care Notes® patient and family information handouts focusing on tuberculosis, varicella (chickenpox), measles, smallpox, SARS, and/or herpes zoster should be provided the patient and family/visitors and documented in nursing notes.
- U. Reporting of Disease(s)/Condition(s) to Public Health Officials: Will be accomplished by the UCH Infection Prevention and Control Department.
1. Public Health officials are to be notified within 24 hours of all cases in which TB treatment is initiated if they have not already been notified.