North Carolina SPICE
Statewide Program for Infection Control & Epidemiology

THE MANY HATS OF LONG-TERM CARE INFECTION PREVENTIONIST

VICKI ALLEN
PAM BLAIR
JAYNE LEE
CLINICAL INFECTION PREVENTION CONSULTANTS

https://spice.unc.edu/
https://spice.unc.edu/ask-spice/

Source: ChatGPT

SPICE

INFECTION PREVENTION FUNDAMENTALS: STANDARD & TRANSMISSION-BASED PRECAUTIONS

Objectives:

- Describe the rationale for standard precautions
- Identify when transmission-based precautions should be utilized
- Describe how enhanced-barrier precautions are implemented in the long-term care setting

STANDARD PRECAUTIONS, ENHANCED BARRIER PRECAUTIONS, AND TRANSMISSION-BASED PRECAUTIONS

- As long as there is a means for transmission, infection will spread to others (chain of infection).
- Interventions that can potentially reduce or eliminate the opportunity for spread, or transmission of infectious agents (germs) in healthcare settings include the use of
- *Standard precautions*
- *Enhanced Barrier precautions &*
- *Transmission-based precautions*

STANDARD PRECAUTIONS (SP)

- SP are the minimum infection prevention practice that applies to all patient care, regardless of suspected or confirmed infection status of the patient/resident
- SP practices are designed to protect both the healthcare personnel and patients and include:
  - Hand hygiene
  - Use of personal protective equipment (e.g., gloves, gowns, masks)
  - Respiratory hygiene/cough etiquette
  - Safe injection practice
  - Use of a mask when injecting the epidural space and
  - Safe handling of potentially contaminated equipment or surfaces in the patient environment

THE SINGLE MOST EFFECTIVE WAY TO PREVENT THE TRANSMISSION OF INFECTION???

Hand hygiene!

HAND HYGIENE

- After touching blood, body fluids, secretions, excretions, contaminated items; immediately after removing gloves; between resident contacts.

- When hands are visibly dirty or contaminated or are visibly soiled with blood or other body fluids, wash hands with either a nonantimicrobial soap and water or an antimicrobial soap and water

APPROACHES THAT SHOULD NOT BE CONSIDERED A ROUTINE PART OF HH

- Do not supply individual pocket-sized alcohol-based hand sanitizer (ABHS) dispensers in lieu of accessible wall-mounted dispensers
- Do not refill or “top-off” soap dispensers, moisturizer dispensers, or ABHS dispensers
- Do not use antimicrobial soaps formulated with triclosan
- Do not routinely double-glove
- Do not remove access to ABHS when responding to organisms such as *C. difficile* or norovirus
- Do not disinfect gloves during care

ENHANCED BARRIER PRECAUTIONS (EBP)

CDC AND CMS

- Applies to ***ALL*** residents with ***ANY of the following:***

  * Infection **OR** colonization with a **MDRO** when *Contact Precautions do not apply*

  * Wounds and/or indwelling medical devices (e.g., central lines, urinary catheters, feeding tube, tracheostomy/ventilator) **REGARDLESS** of MDRO colonization status and *regardless of wherever they reside in the facility.*

- Gown and gloves prior to the high contact care activity (cannot reuse gown, much change between residents)

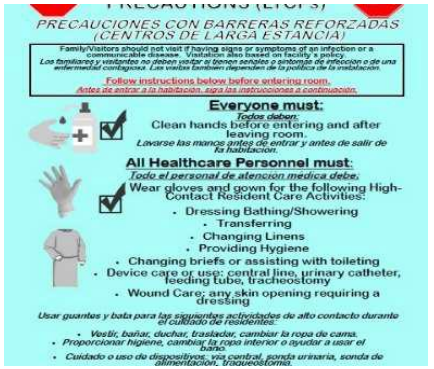
  * Additional PPE (i.e., eye protection) based standard precautions.

- ***No room restriction and not restricted or limited from participation in group activities.***

ENHANCED BARRIER PRECAUTIONS
CDC ***AND*** ***CMS***

- Examples of *high contact resident* care activities *requiring* gown and glove use:
- Dressing
- Bathing/showering
- Transferring
- Provide hygiene (brushing teeth, combing hair, and shaving) primarily bundles with am or pm care
- Changing linens
- Device care or use: central line, urinary catheter, feeding tube, tracheostomy/ventilator
- Wound care: any skin opening requiring a dressing

ENHANCED BARRIER PRECAUTIONS



CDC

- PPE placed ***immediately*** outside the room
- Clear signage placed ***outside*** on the door or wall next to room
- ***Targeted and epidemiologically*** important MDROs

CMS

- PPE and ABHR ***readily accessible to staff.*** Discretion can be used to place near or outside the room
- Facilities can ***use discretion on how to communicte to staff*** to maintain a home-like environment
- CDC ***targeted MDROs*** and ***discretion*** to use for MDROs not targeted.

SPICE

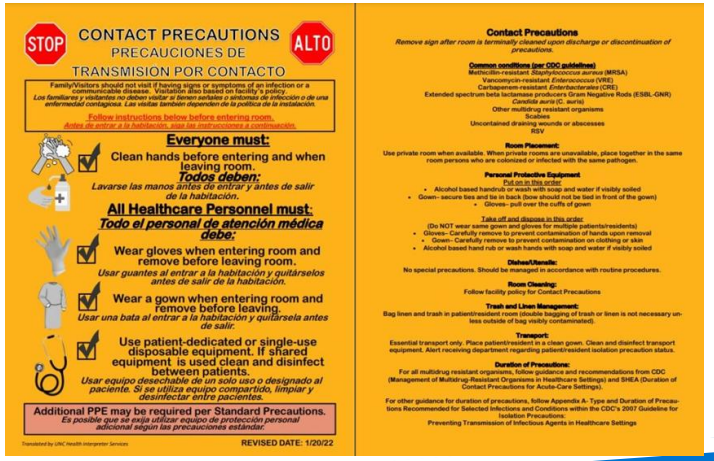
TRANSMISSION-BASED PRECAUTIONS

- In all healthcare settings, there are 3 primary modes of transmission of infectious agents:
- The most common mode of transmission is direct or indirect contact between the source person or object and the susceptible host
- The other 2 modes are via the respiratory route: Droplet transmission and Airborne transmission

CONTACT PRECAUTIONS

Private room or cohort	Gown and gloves before or "upon entry"
Hand hygiene	Dedicate equipment
Disinfect shared equipment	Limit patient movement

- Intended to prevent transmission of infectious agents, including epidemiologically important microorganisms, which are spread by direct or indirect contact with the patient or the patient's environment


STOP

CONTACT PRECAUTIONS

PRECAUCIONES DE TRANSMISION POR CONTACTO

ALTO

Family/Visitors should not visit if having signs or symptoms of an infection or a communicable disease. Visitation also based on facility's policy.

Los familiares y visitantes no deben visitar si tienen señales o síntomas de infección o de una enfermedad contagiosa. Las visitas también dependen de la política de la instalación.

Follow instructions below before entering room.

Antes de entrar a la habitación, siga las instrucciones a continuación.

Everyone must:

Clean hands before entering and when leaving room.

Todos deben:

Lavarse las manos antes de entrar y antes de salir de la habitación.

All Healthcare Personnel must:

Todo el personal de atención médica debe:

Wear gloves when entering room and remove before leaving room.

Usar guantes al entrar a la habitación y quitárselos antes de salir de la habitación.

Wear a gown when entering room and remove before leaving.

Usar una bata al entrar a la habitación y quitársela antes de salir.

Use patient-dedicated or single-use disposable equipment. If shared equipment is used clean and disinfect between patients.

Usar equipo desechable de un solo uso o designado al paciente. Si se utiliza equipo compartido, limpiar y desinfectar entre pacientes.

Additional PPE may be required per Standard Precautions.

Es posible que se exija utilizar equipo de protección personal adicional según las precauciones estándar.

REVISED DATE: 1/20/22

Contact Precautions

Remove sign after room is terminally cleaned upon discharge or discontinuation of precautions.

Common conditions (per CDC guideline)

Methicillin-resistant *Staphylococcus aureus* (MRSA)
Vancomycin-resistant *Enterococcus* (VRE)
Carbapenem-resistant *Enterobacterales* (CRE)
Extended spectrum beta lactamase producers Gram Negative Rods (ESBL-GNR)
Candida auris (*C. auris*)
Other multidrug resistant organisms
Scabies
Uncontained draining wounds or abscesses
RSV

Room Placement:

Use private room when available. When private rooms are unavailable, place together in the same room persons who are colonized or infected with the same pathogen.

Personal Protective Equipment

Put on in this order

- Alcohol based handrub or wash with soap and water if visibly soiled
- Gown– secure ties and tie in back (bow should not be tied in front of the gown)
- Gloves– pull over the cuffs of gown

Take off and dispose in this order

(Do NOT wear same gown and gloves for multiple patients/residents)

- Gloves– Carefully remove to prevent contamination of hands upon removal
- Gown– Carefully remove to prevent contamination on clothing or skin
- Alcohol based hand rub or wash hands with soap and water if visibly soiled

Dishes/Utensils:

No special precautions. Should be managed in accordance with routine procedures.

Room Cleaning:

Follow facility policy for Contact Precautions

Trash and Linen Management:

Bag linen and trash in patient/resident room (double bagging of trash or linen is not necessary unless outside of bag visibly contaminated)

Transport:

Essential transport only. Place patient/resident in a clean gown. Clean and disinfect transport equipment. Alert receiving department regarding patient/resident isolation precaution status.

Duration of Precautions:

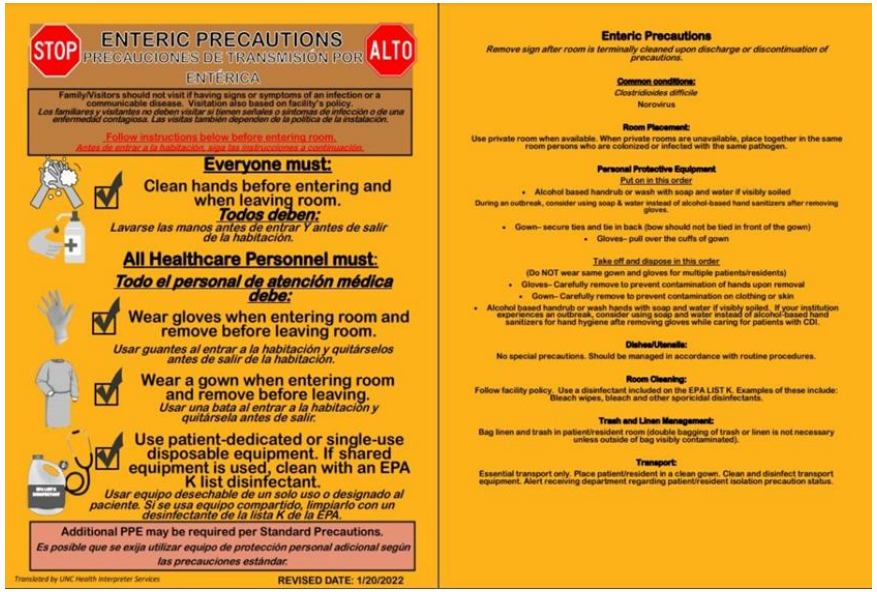
For all multidrug resistant organisms, follow guidance and recommendations from CDC (Management of Multidrug-Resistant Organisms in Healthcare Settings) and SHEA (Duration of Contact Precautions for Acute-Care Settings).

For other guidance for duration of precautions, follow Appendix A- Type and Duration of Precautions Recommended for Selected Infections and Conditions within the CDC's 2007 Guideline for Isolation Precautions:

Preventing Transmission of Infectious Agents in Healthcare Settings

CONTACT PRECAUTIONS: SPECIAL ENTERIC

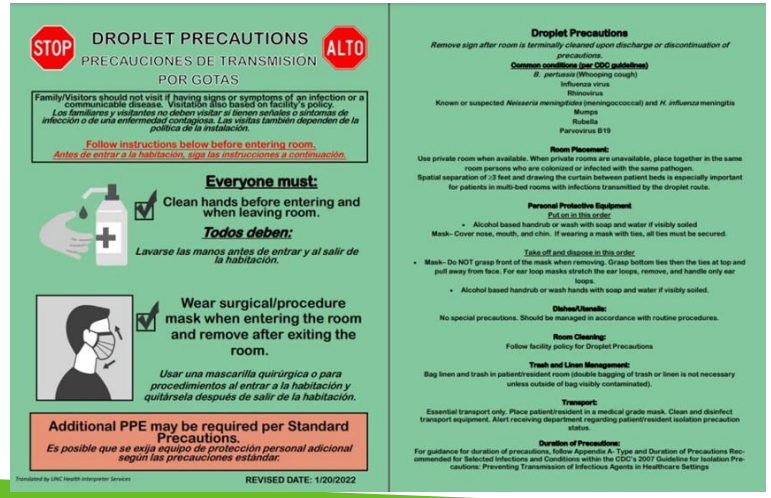
- Contact Precautions are also used for persons with ***Clostridioides difficile (C. Diff)*** and **Norovirus** infections.



- Routine handwashing with soap and water ***OR*** ABHR.
- In addition to contact precautions staff should use ***soap and water if the facility is having an outbreak***, with either of these organisms. If the facility **is not** having an outbreak, ***ABHR can be used for hand hygiene.***

DROPLET PRECAUTIONS

- Surgical mask prior to entry
- No special ventilation
- Private room or Cohort
- Hand hygiene
- Patients/Residents use mask outside of room



Intended to prevent transmission of pathogens spread through close respiratory or mucous membrane contact with respiratory secretions.

Because these pathogens do not remain infectious over long distances in a healthcare facility, special air handling and ventilation are not required to prevent droplet transmission.

AIRBORNE PRECAUTIONS

- AIIR is a single-patient room that is equipped with special air handling and ventilation including:
- Monitored negative pressure related to the surrounding area
- 12 air exchanges/hour for new construction and renovation and 6 air exchanges/hour for existing facilities

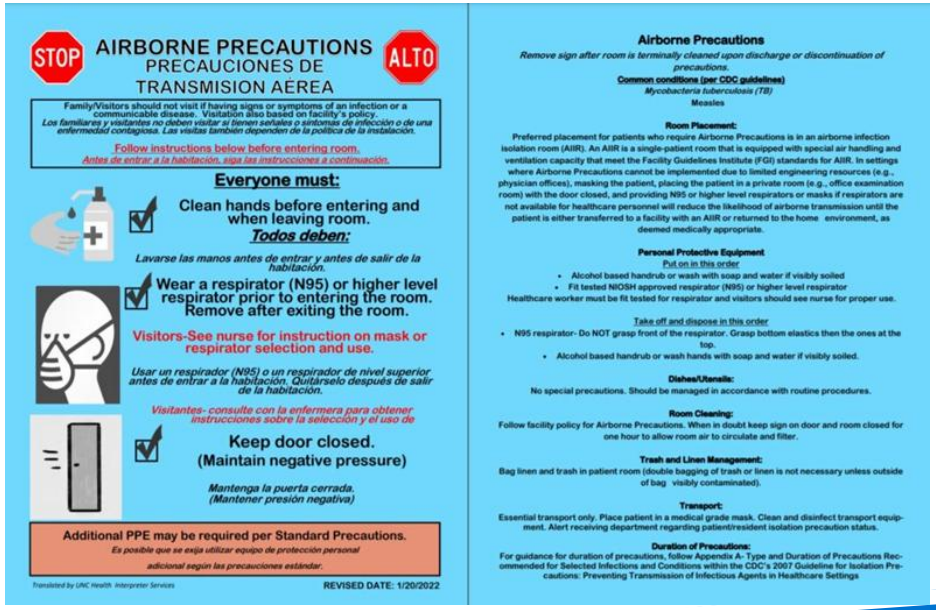
Intended to prevent transmission of infectious agents that remain infectious over long distances when suspended in the air (e.g., measles, varicella virus [chickenpox], and M.tuberculosis).

Preferred placement is an airborne infection isolation room (AIIR)

AIRBORNE PRECAUTIONS

Private room only	Room requires negative airflow pressure
Doors must remain closed	Visual air monitors
Everyone must wear an N-95 respirator or higher	Limit the movement and transport of the patient

- Non-immune healthcare personnel should not care for patients with measles or chickenpox



AIRBORNE PRECAUTIONS
PRECAUCIONES DE TRANSMISION AEREA

STOP ALTO

Family/Visitors should not visit if having signs or symptoms of an infection or a communicable disease. Visitation also based on facility's policy.
Los familiares y visitantes no deben visitar si tienen señales o síntomas de infección o de una enfermedad contagiosa. Las visitas también dependen de la política de la instalación.

Follow instructions below before entering room.
Antes de entrar a la habitación, siga las instrucciones a continuación.

Everyone must:

Clean hands before entering and when leaving room.
Todos deben:
Lavarse las manos antes de entrar y antes de salir de la habitación.

Wear a respirator (N95) or higher level respirator prior to entering the room. Remove after exiting the room.

Visitors-See nurse for instruction on mask or respirator selection and use.
Usar un respirador (N95) o un respirador de nivel superior antes de entrar a la habitación. Quitárselo después de salir de la habitación.
Visitantes- consulte con la enfermera para obtener instrucciones sobre la selección y el uso de

Keep door closed.
(Maintain negative pressure)
Mantenga la puerta cerrada.
(Mantener presión negativa)

Additional PPE may be required per Standard Precautions.
Es posible que se exija utilizar equipo de protección personal adicional según las precauciones estándar.

Translated by UNC Health Interpreter Services

REVISED DATE: 1/20/2022

Airborne Precautions

Remove sign after room is terminally cleaned upon discharge or discontinuation of precautions.

Common conditions (per CDC guidelines)
Mycobacteria tuberculosis (TB)
Measles

Room Placement:
Preferred placement for patients who require Airborne Precautions is in 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 Facility Guidelines Institute (FGI) standards for AIIR. In settings where Airborne Precautions cannot be implemented due to limited engineering resources (e.g., physician offices), masking the patient, placing the patient in a private room (e.g., office examination room) with the door closed, and providing 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 returned to the home environment, as deemed medically appropriate.

Personal Protective Equipment
Put on in this order
- Alcohol based handrub or wash with soap and water if visibly soiled
- Fit tested NIOSH approved respirator (N95) or higher level respirator

Healthcare worker must be fit tested for respirator and visitors should see nurse for proper use.

Take off and dispose in this order
- N95 respirator- Do NOT grasp front of the respirator. Grasp bottom elastics then the ones at the top.
- Alcohol based handrub or wash hands with soap and water if visibly soiled.

Dishes/Utensils:
No special precautions. Should be managed in accordance with routine procedures.

Room Cleaning:
Follow facility policy for Airborne Precautions. When in doubt keep sign on door and room closed for one hour to allow room air to circulate and filter.

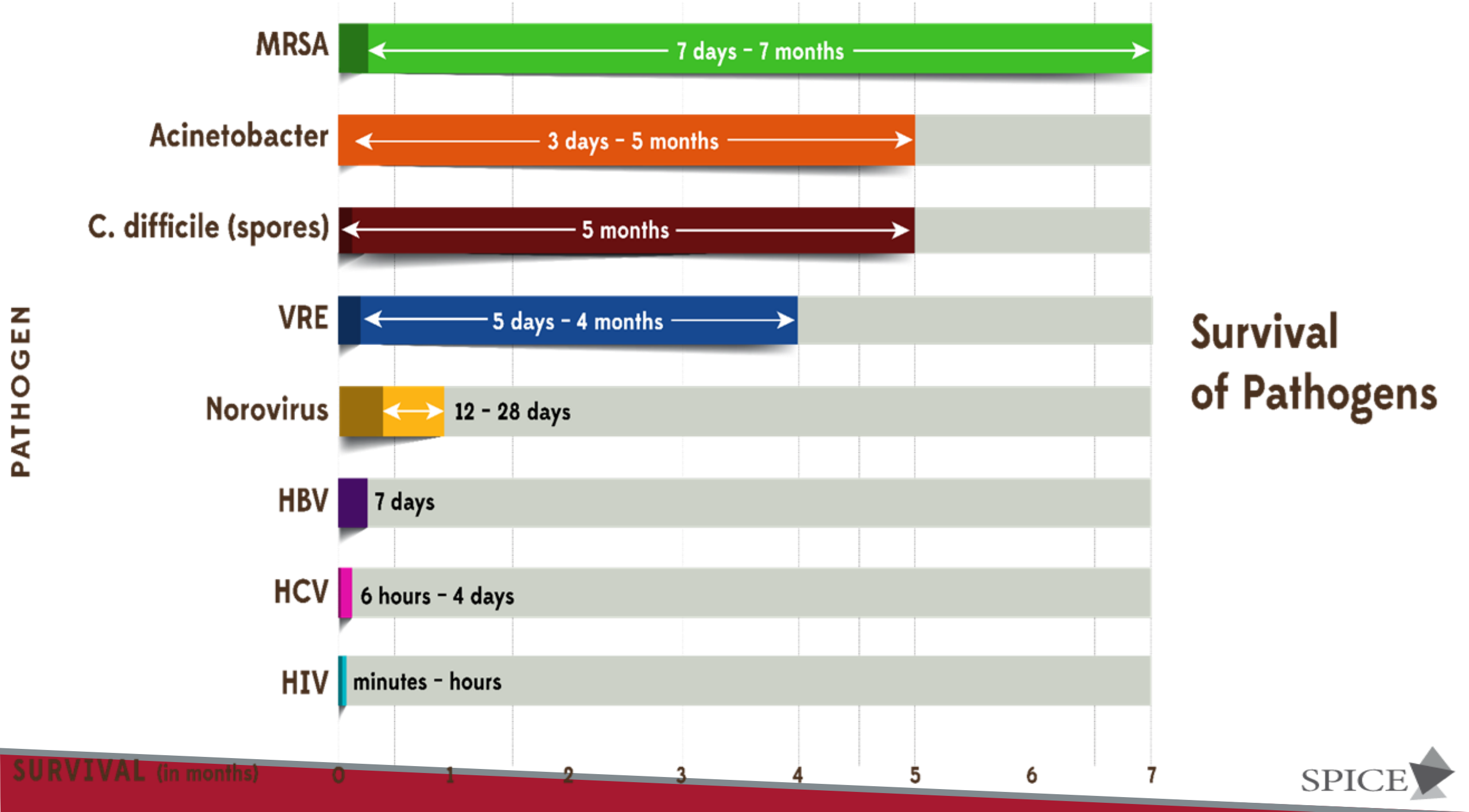
Trash and Linen Management:
Bag linen and trash in patient room (double bagging of trash or linen is not necessary unless outside of bag visibly contaminated).

Transport:
Essential transport only. Place patient in a medical grade mask. Clean and disinfect transport equipment. Alert receiving department regarding patient/resident isolation precaution status.

Duration of Precautions:
For guidance for duration of precautions, follow Appendix A- Type and Duration of Precautions Recommended for Selected Infections and Conditions within the CDC's 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings

ENVIRONMENTAL CLEANING AND DISINFECTION

- Standardized protocols/procedures for cleaning and disinfection
- Select EPA-registered disinfectants that have microbiocidal activity against the pathogens most likely to contaminate the resident environment
- Ensure staff follows manufacturer's instructions for proper use (MIFU) and using appropriate PPE
- ***Thoroughly train staff***



Survival of Pathogens

SPICE

WHEN TO DISCONTINUE TBP PRECAUTIONS

- Resume Standard Precautions once high-risk exposures or active symptoms have discontinued
  - Refer to ***Appendix A in the 2007 Isolation Guidelines-updated 2024***

Accessible version: https://www.cdc.gov/infection-control/hcp/isolation-precautions/index.html

2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings

Last update: September 2024

Jane D. Siegel, MD; Emily Rhinehart, RN MPH CIC; Marguerite Jackson, PhD; Linda Chiarello, RN MS; the Healthcare Infection Control Practices Advisory Committee

PPE DONNING/DOFFING AND FIT TESTING

Objectives:

- Describe how to properly don and doff PPE in a manner that reduces risk of contamination.
- Outline and describe the required elements of an OSHA compliant Respiratory Protection Program (RPP)
- Describe the process and rationale for initial and annual N95 fit testing.

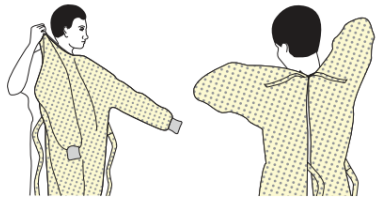
SEQUENCE FOR PUTTING ON PPE

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

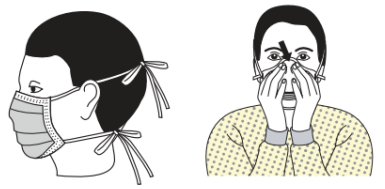
1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



2. MASK OR RESPIRATOR

- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator

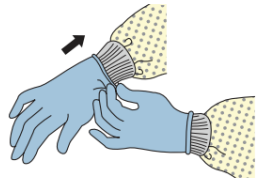


3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit

4. GLOVES

- Extend to cover wrist of isolation gown



USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene

CS250672-F

HOW TO SAFELY REMOVE PPE

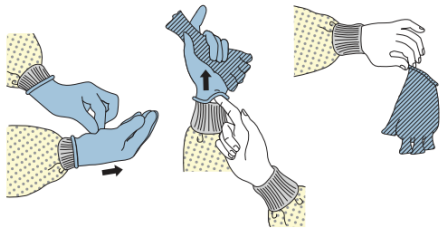
Exit Room before removing mask or N95

HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GLOVES

- Outside of gloves are contaminated!
- If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
- Discard gloves in a waste container

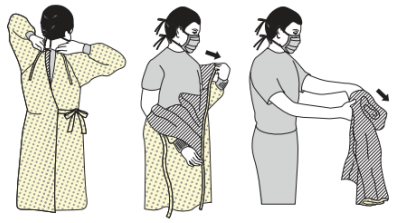


2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band or ear pieces
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

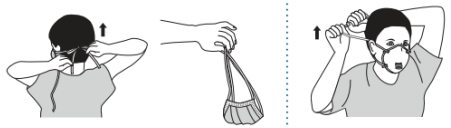
3. GOWN

- Gown front and sleeves are contaminated!
- If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
- Pull gown away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard in a waste container

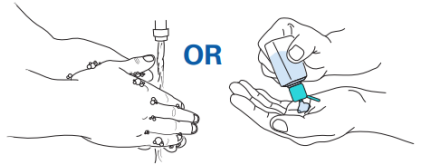


4. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — DO NOT TOUCH!
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container



5. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



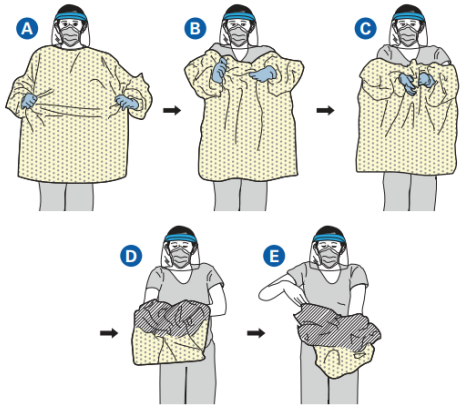
PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE

HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 2

Here is another way to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GOWN AND GLOVES

- Gown front and sleeves and the outside of gloves are contaminated!
- If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands
- While removing the gown, fold or roll the gown inside-out into a bundle
- As you are removing the gown, peel off your gloves at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container



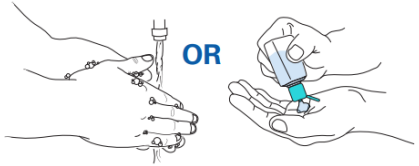
2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band and without touching the front of the goggles or face shield
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

3. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — DO NOT TOUCH!
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container

4. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE

RESPIRATORS

- Tight-fitting devices worn to protect the wearer from inhaling infectious particles – several types available
- Should be worn when in close contact with someone with suspected or confirmed COVID-19 infection or airborne transmitted diseases

https://www.osha.gov/sites/default/files/respiratory-protection-covid19-long-term-care.pdf

https://www.osha.gov/sites/default/files/respiratory-protection-covid19-compliance.pdf

DONNING AND DOFFING N95 RESPIRATOR

Respirator Safety. Donning (Putting on) and Doffing (Taking off) and User Seal Checks	Seguridad de Máscaras de Respiración
Runtime: 9:17 mins	Runtime: 10:36 mins
	Date: December 2009

Respiratory Protection - Training Videos | Occupational Safety and Health Administration

OSHA RESPIRATOR SAFETY VIDEO

RESPIRATORY PROTECTION PROGRAM (RPP):
AN OVERVIEW

https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134

KEY REQUIREMENTS OF A RESPIRATORY PROTECTION PROGRAM

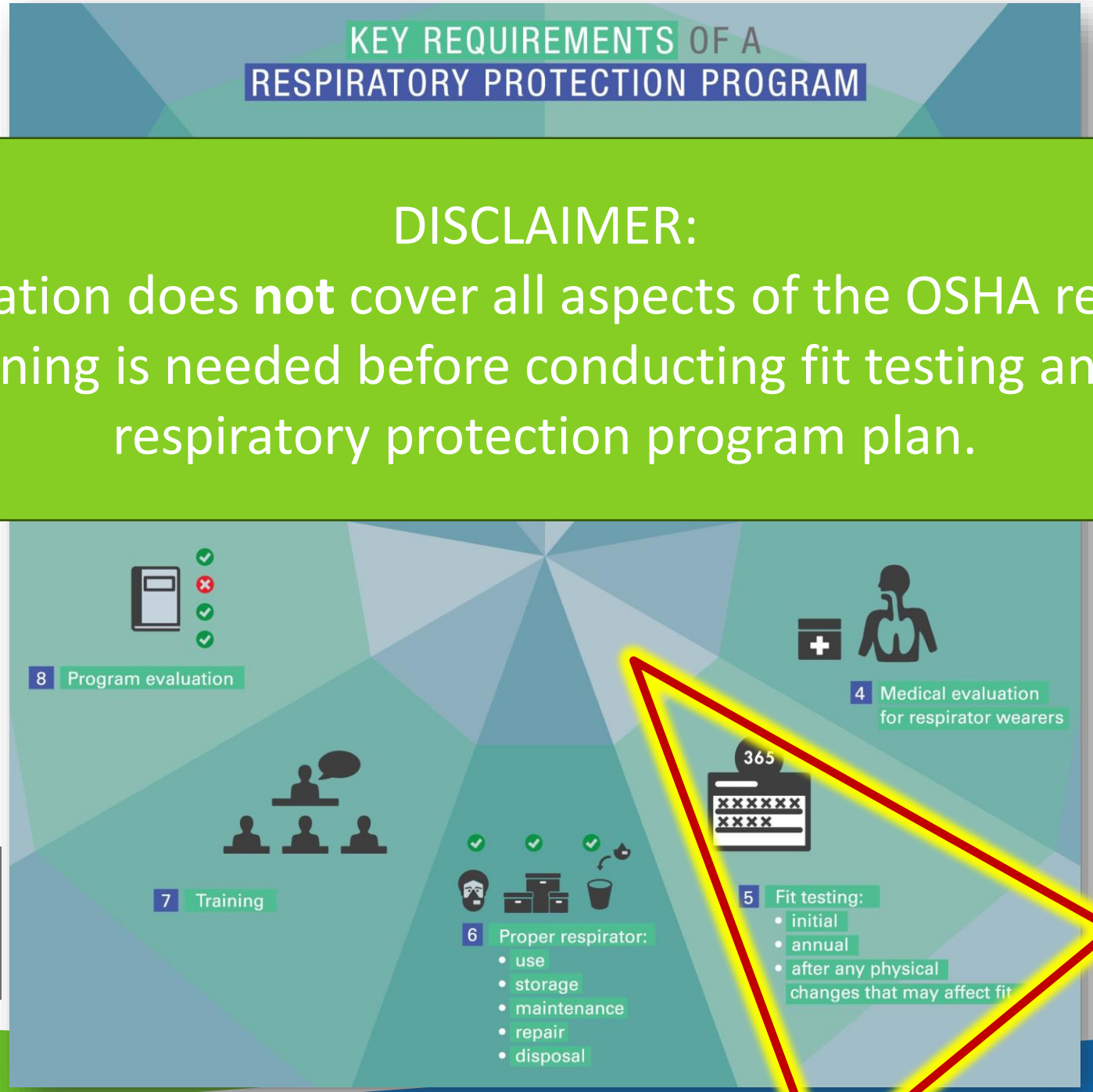
Detailed instructions are found in OSHA 29 CFR 1910.134

Resources:

- Hospital Respiratory Protection Program Toolkit
  http://www.cdc.gov/niosh/docs/2015-117/pdfs/2015-117.pdf
- Implementing Hospital Respiratory Protection Programs: Strategies from the Field
  http://www.jointcommission.org/assets/1/18/Implementing_Hospital_RPP_2-19-15.pdf
- OSHA Respiratory Protection Standard 1910.134
  https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=12716&p_table=STANDARDS

Department of Health and Human Services
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

SPICE



DISCLAIMER:

This presentation does **not** cover all aspects of the OSHA requirements. Additional training is needed before conducting fit testing and writing your respiratory protection program plan.

Instructions are found in OSHA 29 CFR 1910.134

Resources:

- Hospital Respiratory Protection Program Toolkit
  http://www.cdc.gov/niosh/docs/2015-117/pdfs/2015-117.pdf
- Implementing Hospital Respiratory Protection Programs: Strategies from the Field
  http://www.jointcommission.org/assets/1/18/Implementing_Hospital_RPP_2-19-15.pdf
- OSHA Respiratory Protection Standard 1910.134
  https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=12716&p_table=STANDARDS

Department of Health and Human Services
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

CDC Workplace Safety and Health | NIOSH

SPICE

“The Respiratory Protection Standard (1910.134) is usually one of the top 10 most frequently cited standards following inspections of workplaces by OSHA.” Source: OSHA RPP website

Sources: OSHA
Image by ChatGPT

SPICE

OSHA ACCEPTED FIT TESTING

QUALITATIVE VS. QUANTITATIVE

Cost to purchase kit
$250-$400

Cost to purchase machine
$7,000 - $20,000

1910.134 App A - Fit Testing Procedures (Mandatory). | Occupational Safety and Health Administration

QUALITATIVE SENSITIVITY SCREENING & FIT TESTING

- Employee wears hood without respirator for **sensitivity screening**
- Nebulizer introduces Bitrex™ (bitter) or Saccharin (sweet) solution – most use Bitrex due to ease of detection
- Employee signals when bitter or sweet taste detected (how many squeezes until tasted)
- **Fit test** performed while employee wears respirator and completes 7 OSHA exercises
  - PASS = no taste detected
  - FAIL = taste detected during testing

KEY REQUIREMENTS OF RPP

FIT TESTING

1910.134(f)

- Annual fit testing, additional fit testing if facial changes occur (or new N95 model or size is introduced)
- Facial shape considerations for N95 models offered
- User seal checks must be performed each time a respirator is donned

Important:
When you pass a fit test, you are only cleared to use that same make, model, style, and size respirator you were tested on.

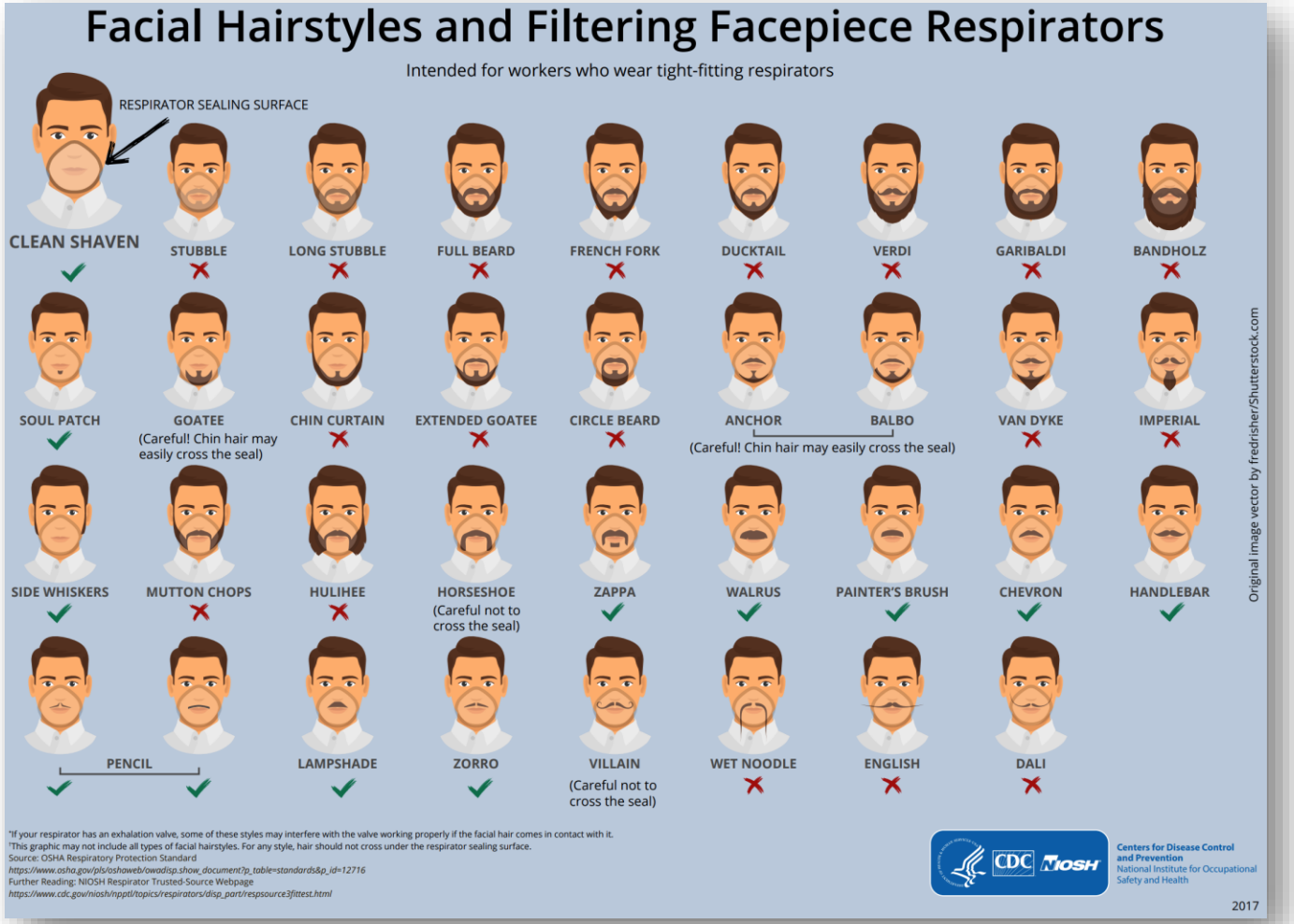
Resource for Fit Testers:
15-Minute SPICE Training Video
https://vimeo.com/672964412/97066da888?fl=pl&fe=cm

KEY REQUIREMENTS OF RPP

FIT TESTING

1910.134(f)

- N95 Respirators cannot be worn when:
  - Facial hair comes between the sealing surface of the facepiece and the face
  - Any condition interferes with seal



Fit Testing | Personal Protective Equipment | CDC

PAPRs are an option when unable to get a seal with an N95.

FIT TEST DAY PLANNING

- Approx time frames for each fit test appt = 13 to 18 minutes each person
  - 3-5 minutes for donning N95 & fitting with mirror, teach/perform seal check, remove N95, explain sensitivity test and fit test process, document
  - 2-3 minutes for sensitivity test, employee takes sips of water to clear taste of solution, document number of squeezes until tasted
  - 8-10 minutes to don N95 again, perform seal check and reposition if necessary, fit test (either 10, 20 or 30 squeezes per exercise based on sensitivity test) with 7 + minutes of exercise, document, clean hood

FIT TEST DAY SUPPLIES

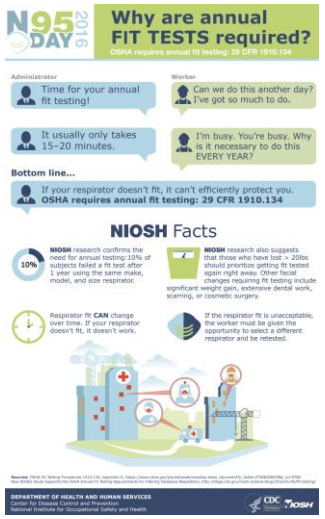
Reminder: Do not eat, drink (except plain water), smoke, or chew gum for 15 minutes before test

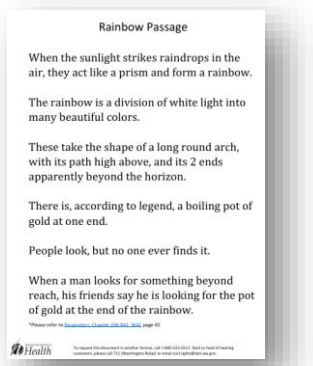
Fit Test Exercises

(Saccharin/Bitrex Qualitative Fit Test Protocol)

TIME	SQUEEZES			EXERCISE
0:00	10	20	30	1. **Normal breathing**. In a normal standing position, without talking, the subject shall breathe normally. The test subject shall breathe through the slightly **open mouth** with tongue extended.
0:30	5	10	15	**Continue exercise #1 (Normal breathing)**
1:00	5	10	15	2. **Deep breathing**. In a normal standing position, the subject shall breathe slowly and deeply (through the slightly **open mouth** with tongue extended) taking caution so as not to hyperventilate.
1:30	5	10	15	**Continue exercise #2 (Deep breathing)**
2:00	5	10	15	3. **Turning head side to side**. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side (through the slightly **open mouth** with tongue extended).
2:30	5	10	15	**Continue exercise #3 (Turning head side to side)**
3:00	5	10	15	4. **Moving head up and down**. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling). The test subject shall breathe through the slightly **open mouth** with tongue extended.
3:30	5	10	15	**Continue exercise #4 (Moving head up and down)**
4:00	5	10	15	5. **Talking**. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the ***Rainbow Passage***, count backward from 100, or recite a memorized poem or song.
4:30	5	10	15	**Continue exercise #5 (Talking)**
5:00	5	10	15	6. **Bending over**. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments that do not permit bending over at the waist. The test subject shall breathe through the slightly **open mouth** with tongue extended.
5:30	5	10	15	**Continue exercise #6 (Bending over)**
6:00	5	10	15	7. **Normal breathing**. Same as exercise #1.
6:30	5	10	15	**Continue exercise #7 (Normal breathing)**
7:00	0	0	0	**STOP.** The fit test is complete.

Each test exercise shall be performed for one minute. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it *has become unacceptable, another model of respirator shall be tried. The respirator shall not be*





Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow.

The rainbow is a division of white light into many beautiful colors.

These take the shape of a long round arch, with its path high above, and its 2 ends apparently beyond the horizon.

There is, according to legend, a boiling pot of gold at one end.

People look, but no one ever finds it.

When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

Tracking forms

Disinfecting Wipes

TOP 10 FIT TESTING CHALLENGES

1. **Facial Hair Interfering with the Seal**
   Even small amounts of facial hair can prevent an adequate respirator seal.
2. **Improper Respirator Size or Model Selection**
   Not every N95 fits every face shape correctly.
3. **Incorrect Donning Technique**
   Poor strap placement or nosepiece adjustment can lead to leakage.
4. **Failure to Perform a Proper User Seal Check**
   Employees may skip or incorrectly perform seal checks before testing.
5. **Employee Anxiety or Claustrophobia**
   Some individuals become uncomfortable wearing the hood or respirator.
6. **Difficulty Detecting Bitrex™ or Saccharin Taste**
   Illness, medications, smoking, or reduced taste sensitivity may affect results.
7. **Inadequate Nebulizer Technique**
   Incorrect aerosol generation can lead to inaccurate test results.
8. **Talking, Laughing, or Excessive Movement During Testing**
   Uncontrolled movement may disrupt the respirator seal.
9. **Time Constraints and Staffing Challenges**
   Completing medical evaluations, training, and annual fit testing requires significant coordination.
10. **Incomplete Documentation**
    Missing respirator model numbers, test dates, or pass/fail records can create OSHA compliance risks.

SUMMARY

FOLLOW OSHA FIT TESTING PROCEDURES, N95, & FIT TEST KIT MANUFACTURER INSTRUCTIONS

[1910.134 App A - Fit Testing Procedures (Mandatory). | Occupational Safety and Health Administration]

Appendix A to § 1910.134 - Fit Testing Procedures (Mandatory)

Part I. OSHA-Accepted Fit Test Protocols

A. Fit Testing Procedures - General Requirements

The employer shall conduct fit testing using the following procedures. The requirements in this appendix apply to all OSHA-accepted fit test methods, both QLFT and QNFT.

1. The test subject shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.

3. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

SPICE

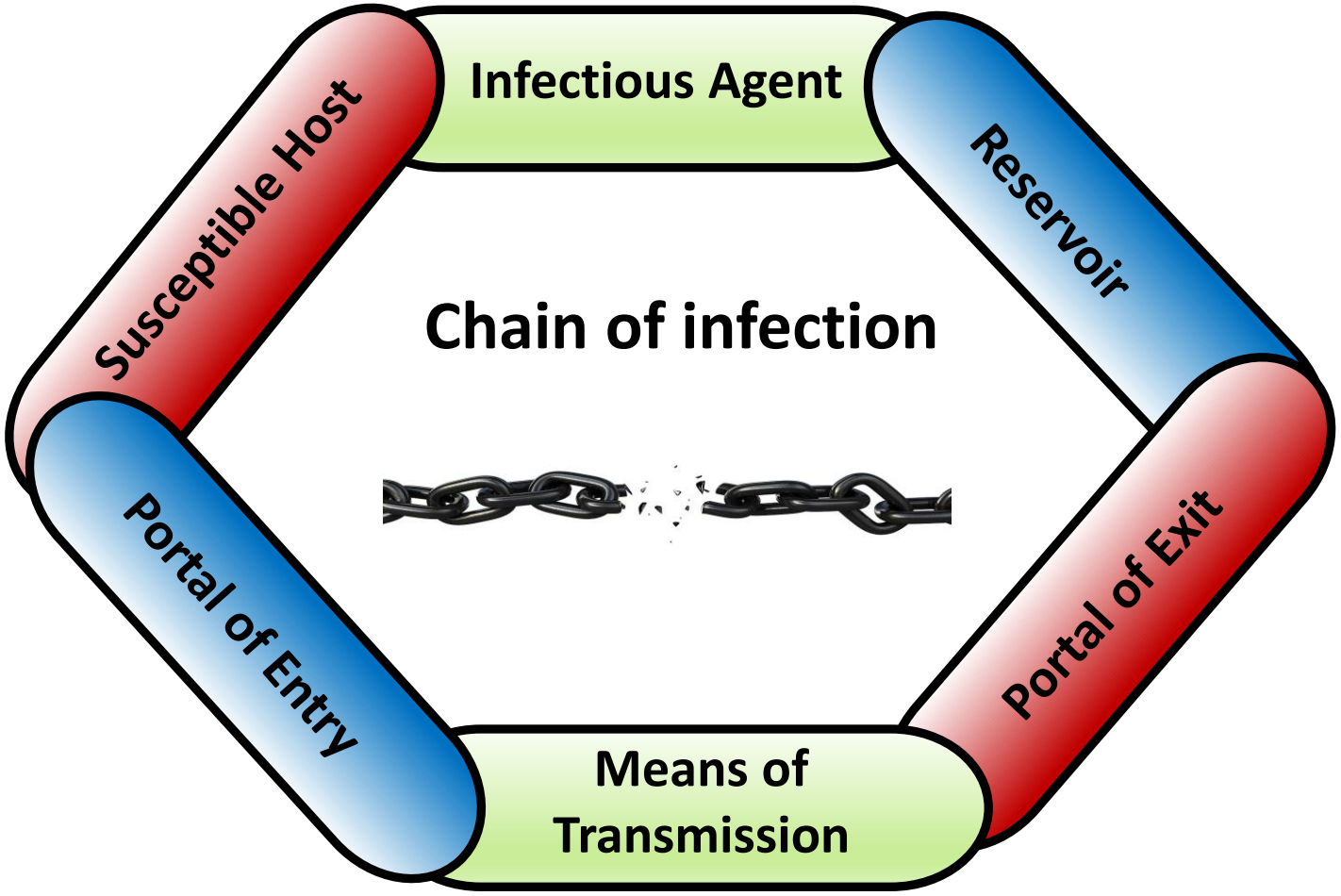
RPP & FIT TESTING RESOURCES

- OSHA 1910.134 - Respiratory protection. https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134
- OSHA Respirator Medical Evaluation Questionnaire (Mandatory). https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134AppC
- OSHA Fit Testing Procedures. https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134AppA
- OSHA Respirator Medical Evaluation Questionnaire (Mandatory). https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134AppC
- NC Respiratory Protection Program Template. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fepi.dph.ncdhhs.gov%2Fphpr%2Fdocs%2FWrittenRPPTemplate.doc&wdOrigin=BROWSELINK
- North Carolina Division of Public Health Respiratory Protection Guidance November 2021. https://epi.dph.ncdhhs.gov/phpr/docs/NCDPHRespiratoryProtectionGuidanceNov2021.pdf
- Respiratory Protection Training Videos. https://www.osha.gov/respiratory-protection/training
- NC OSHA Training.(Next webinar: Respiratory Protection on June 4, 2026) https://www.onlineregistrationcenter.com/registerlist.asp?m=4392&keyword=&p=2&zip=&radius=&dsd=0&s=4
- N95 Fit Test Instructions: https://vimeo.com/672964412/97066da888?fl=pl&fe=cm

CONSTRUCTION UPDATE IN LTC
WHEN TO PUT ON YOUR HARD HAT!

- Describe the chain of infection in regards to the infection risk of construction and renovation
- Discuss most common pathogen associated with infections from construction and the severity these infections cause
- Explain Infection Control Risk Assessment (ICRA) requirements, process, and key staff involvement.
- Identify and be able to implement infection control measures during construction and renovation projects

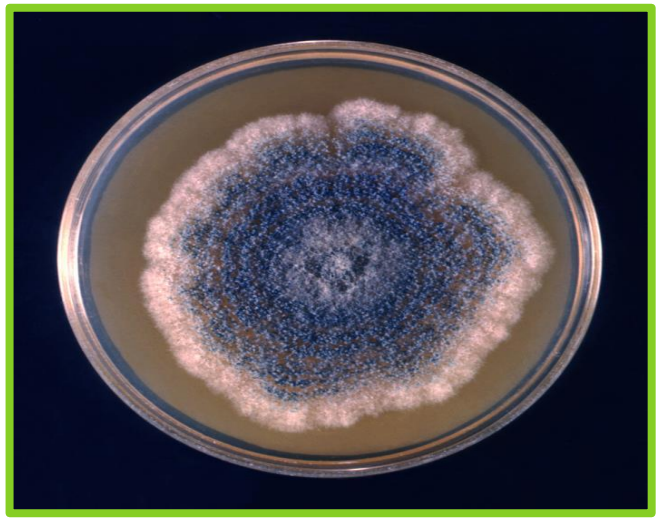
CHAIN OF INFECTION IN CONSTRUCTION AND RENOVATION

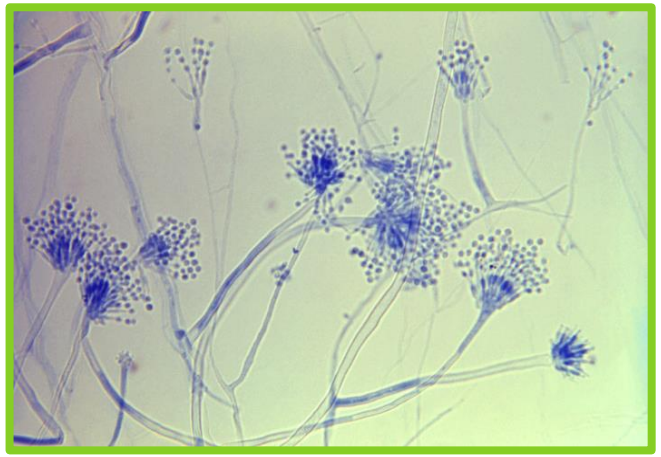


CHAIN OF INFECTION IN CONSTRUCTION AND RENOVATION

Infectious Agent

- Fungus
  - Mold- Largest concern
    - Ubiquitous in environment- found in water, soil, and air
    - Aspergillus
    - Zygomycetes
    - Stachybotrys chartarum (black mold)
- Bacteria





Images from CDC's public health image library https://phil.cdc.gov/

CHAIN OF INFECTION IN CONSTRUCTION AND RENOVATION

Reservoir

Need a food source to grow.

Mold and different fungi like cellulose materials such as:

- Drywall
- Ceiling Tiles
- Behind wall paper and wall coverings

Ordog, Gary. (2002). TOXIC MOLD. NORTH CAROLINA; THE CHARLOTTE OBSERVER. Featuring: Gary Joseph Ordog, MD. DOI: 10.13140/RG.2.2.22138.72641 ..

https://energyresearch.ucf.edu/consumer/buildings/building-science-basics/mold-growth/

CHAIN OF INFECTION IN CONSTRUCTION AND RENOVATION

Portal of Exit

- Demo
- Infectious agents may become airborne during construction activities
- Mold counts in the air are higher than normal during a removal or cleaning project

Image from: https://www.placenorthwest.co.uk/news/work-underway-on-rochdale-indoor-market/

CHAIN OF INFECTION IN CONSTRUCTION AND RENOVATION

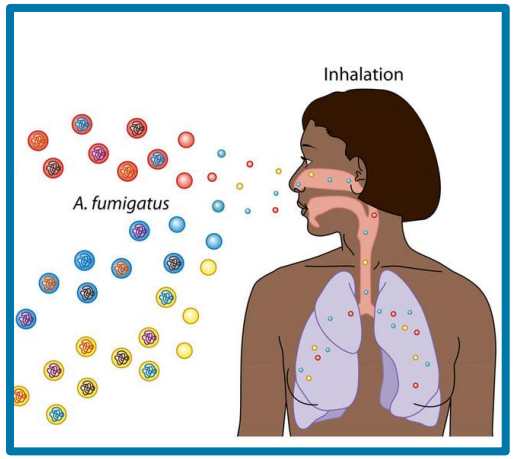
Means of Transmission

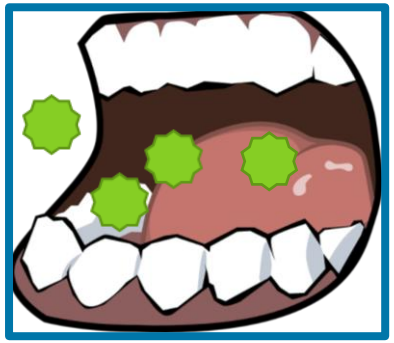
- Hands 
- Air current 
- Tools 
- Cart 
- Equipment 
- Construction materials 

CHAIN OF INFECTION IN CONSTRUCTION AND RENOVATION

Portal of Entry

- Inhalation
- Ingestion
- Open wounds
- Burns





Images from:
Keller, Nancy. (2017). Heterogeneity Confounds Establishment of "a" Model Microbial Strain. mBio. 8. e00135-17. 10.1128/mBio.00135-17. and https://phil.cdc.gov/

CHAIN OF INFECTION IN CONSTRUCTION AND RENOVATION

Susceptible Host

- Immunocompromised
  - Cancer
  - Immunosuppressive therapies
- Allergic
- Higher risk populations susceptible to mold:
  - Diabetes mellitus (unregulated)–Dialysis
  - Cavitary illness (dead lung tissue)–Tuberculosis
  - Late stage HIV/ AIDS
  - Chronic granulomatous disease
  - Premature infants
  - Severe malnutrition & alcoholism
  - Recent surgical residents

COMMON PATHOGENS FROM CONSTRUCTION AND RENOVATION

- Aspergillus spp.:
  - Spores are ubiquitous in the environment
  - May travel long distances as airborne particles and are inhaled by humans (several hundred spores each day)
  - Healthy individuals are able to remove spores with our innate defense (macrophages)
  - Severely immunocompromised individuals are great risk for serious complications.
  - Can cause invasive (overall case fatality rate was 58% in reviewed reports), allergic, or chronic infections.

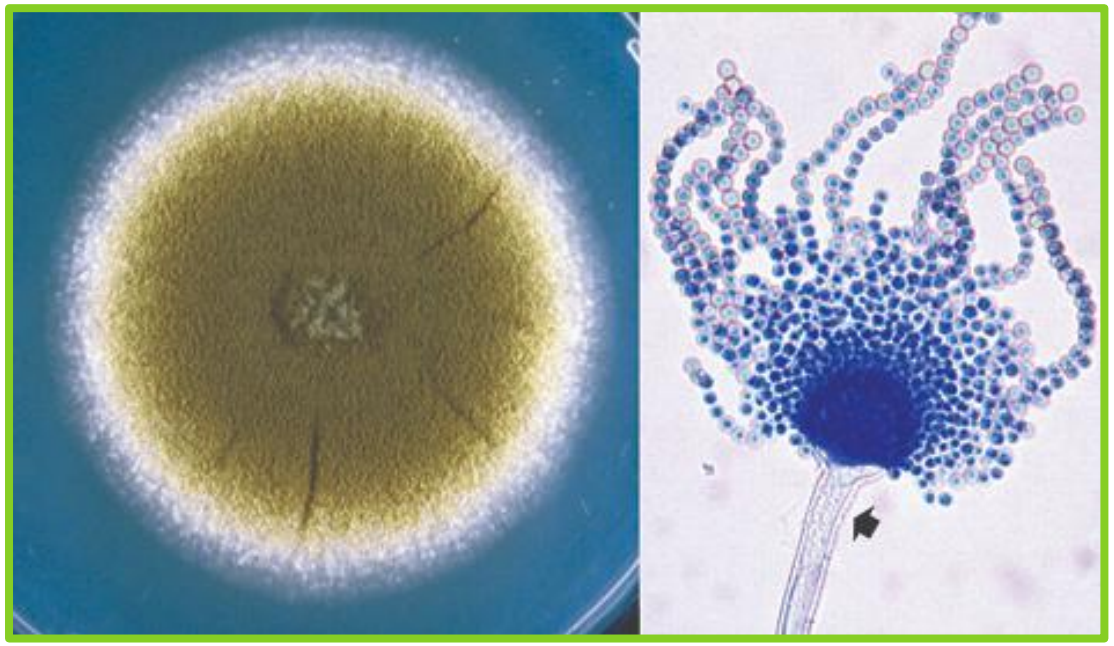


Image from: https://mycology.adelaide.edu.au/descriptions/hyphomycetes/aspergillus/

COMMON PATHOGENS FROM CONSTRUCTION AND RENOVATION

- Fungal spores in the air increase dramatically with:
  - Renovation, construction, excavation
  - Ceiling access
  - A contaminated or defective air supply

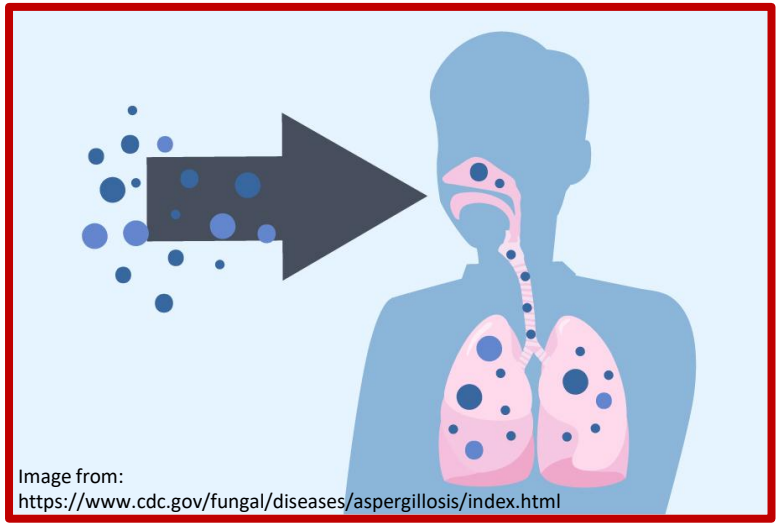


Image from:
https://www.cdc.gov/fungal/diseases/aspergillosis/index.html

Nosocomial aspergillosis in outbreak settings systematic review

- 53 studies with 458 patients
- 356 patients (78%) were lower respiratory tract
- Underlying disease-hemotologic malignancies 299 (65%)
  - Overall fatality rate in these 299 patients (57.6%)
- Construction or demolition probable/possible source-49%
- Virtually all outbreaks attributable to airborne source, usually construction
- Residents at risk should not be exposed to Aspergillus

INFECTION CONTROL RISK ASSESSMENT (ICRA)

- ICRA is an multidisciplinary, organizational, documented process that considers the facility's patient population and type of construction project (non-invasive to major demolition):
  - Focuses on reduction of risk from infection
  - Acts through phases of facility planning, design, construction, renovation, facility maintenance, clean up
  - Coordinates and disseminates knowledge about infection, infectious agents, type of construction project and care environment permitting the organization to anticipate potential impact

What Are the Risks Associated with Construction and Renovation in Healthcare Settings? William A. Rutala, Ph.D., M.P.H., C.I.C

INFECTION CONTROL RISK ASSESSMENT (ICRA) EDUCATION

- Construction Workers:
  - Adverse effects of construction dust on residents
  - The ICRA process
  - Specific facility rules, such as entry and exit from buildings
  - Worksite containment
  - Dust control measures
  - Containment and transport of construction materials and debris including use of elevator(s)

- Facility staff impacted by project:
  - A review of the ICRA plan
  - Appropriate signage at the worksite
  - What proper barriers look like
  - Proper above-ceiling dust control measures
  - The importance of negative pressure
  - Proper debris removal procedure
  - Whom to notify about possible deficiencies.

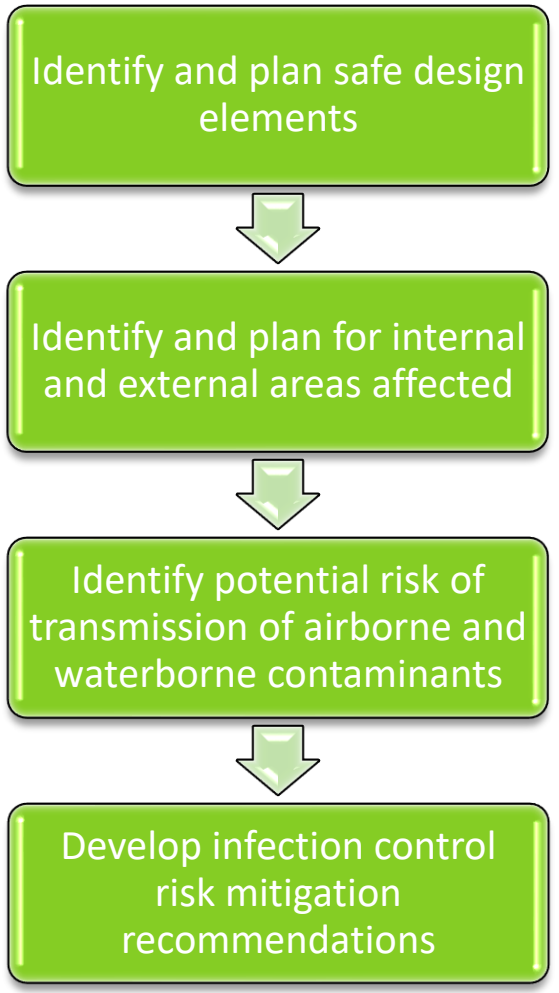
APIC Infection Prevention Manual for Construction and Renovation

Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

INFECTION CONTROL RISK ASSESSMENT (ICRA) DOCUMENTED PROCESS TO PROACTIVELY:

		|Permit No:			
Location of Construction:		|Project Start Date:			
Project Coordinator:		|Estimated Duration:			
Contractor Performing Work:		|Permit Expiration Date:			
Supervisor:		|Telephone:			
YES	NO	CONSTRUCTION ACTIVITY	YES	NO	INFECTION CONTROL RISK GROUP
		TYPE A: Inspection, non-invasive activity			GROUP 1: Non-Patient Care Areas
		TYPE B: Small scale, short duration, moderate to high levels			GROUP 2: Patient Care Areas
		TYPE C: Activity generates moderate to high levels of dust, requires greater 1 work shift for comp.			
		TYPE D: Major duration and construction activities Requiring consecutive work shifts			
CLASS I		1. Execute work by methods to minimize raising dust from construction operations. 2. Immediately replace any ceiling tile displaced for visual inspection.			
CLASS II		1.All Class I Precautions 2.Provides active means to prevent air-borne dust from dispersing into atmosphere 3. Water mist work surfaces to control dust while cutting. 4. Seal unused doors with duct tape. 5. Block off and seal air vents. 6. Place dust mat at entrance and exit or work area. 7. Remove or isolate HVAC system in areas where work is being performed.			
CLASS III Date Initial		1. All Class I and II Precautions 2. Remove or isolate HVAC system in area where work is being done to prevent contamination of duct system. 3. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Isolate HVAC system in area where work is being done to prevent contamination of the duct system. 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 5. Contain construction waste before transport in tightly covered containers. 6. Cover transport receptacles or carts. Tape covering unless solid lid.			
CLASS IV Date Initial		1. All Class I, II, and III Precautions 2. Isolate HVAC system in area where work is being done to prevent contamination of duct system. 3. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 5. Seal holes, pipes, conduits, and punctures appropriately. 6. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or thy can wear cloth or paper coveralls that are removed each time they leave the work site. 7. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.			
Additional Requirements:					
_____ Date Initials			_____ Exceptions/Additions to this permit Date Initials are noted by attached memoranda		
Permit Request By:			Permit Authorized By:		
Date:			Date:		

Infection Control Project Permit



Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

INFECTION CONTROL RISK ASSESSMENT (ICRA)

Identify and plan safe design elements

Design Elements

- Number and location of hand washing stations and hand sanitation dispensers
- Impact on water system
- Surfaces and finishes

Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

INFECTION CONTROL RISK ASSESSMENT (ICRA)

Identify and plan for internal and external areas affected

Identify potential risk of transmission of airborne and waterborne contaminants

Construction Elements

- Location of residents and resident care equipment/materials
- Interruptions in water, electric and HVAC must be planned (potential risks for airborne and waterborne contaminants)
- Impact of moving debris, traffic flow, and spill clean-up
- Assessment of construction activities

Oral presentation

Massive hospital-wide bacillus outbreak related to hospital linen and construction

M Balm*, C Teo, R Jureen, R Lin and D Fisher

Open Access

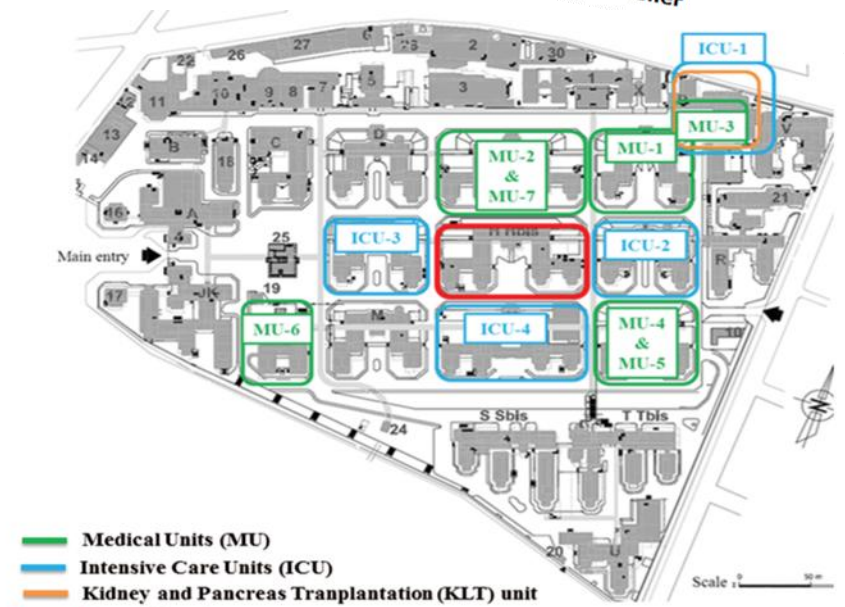


Figure 1. Locations of monitored hospital units, Edouard Herriot Hospital, Lyon, 2015.

Loeffert, S. T.,et.al. (2019). Investigation of the relationships between clinical and environmental isolates of Aspergillus fumigatus by multiple-locus variable number tandem repeat analysis during major demolition work in a French hospital. Clinical Infectious Diseases, 68(2), 321-329.

Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

INFECTION CONTROL RISK ASSESSMENT (ICRA)

Develop infection control risk mitigation recommendations

- Resident placement/location
- Barriers and other protective measures
- Temporary phasing of HVAC/water
- Protection from demolition
- Training
- Impact of utility outages
- Movement of debris, traffic flow, cleanup and elevator control
- Provision of bathroom and food for construction workers
- Protection of building material

Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

SPICE

INFECTION CONTROL RISK ASSESSMENT (ICRA) DETERMINING CONTROL MEASURES

Identify type of Construction

- Type A – Inspection and non-invasive activities
- Type B – Small scale, short duration, limited dust
- Type C – Requires demolition and removal of fixtures, moderate to high dust
- Type D – Major demolition and construction

Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

INFECTION CONTROL RISK ASSESSMENT (ICRA) DETERMINING CONTROL MEASURES

Patient Risk Groups

- Low risk – Office areas, public areas
- Medium risk – Outpatient clinics, cafeterias, public corridors
- High risk – All inpatient nursing units (except ICU/Stepdown), ER, L&D, etc.
- Highest risk - All ICUs and Stepdowns, Oncology, Surgical suites (OR, PACU), Transplant clinics

Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

DETERMINING CONTROL MEASURES

Complete Risk Matrix

Risk Group	Type A	Type B	Type C	Type D
Low	I	II	II	III/IV
Medium	I	II	III	IV
High	I	II	III/IV	IV
Highest	I-III	III/IV	III/IV	IV

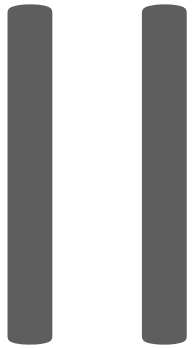
Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

INFECTION CONTROL PRECAUTIONS BY CLASS

During Construction	Upon Completion
1. Minimize raising dust 2. Replace displaced ceiling tiles	1. Clean work area upon completion

Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

INFECTION CONTROL PRECAUTIONS BY CLASS



During Construction	Upon Completion
1. Provide active means to prevent airborne dust dispersal 2. Water mist surfaces 3. Seal unused doors 4. Sticky mat at entrance 5. Seal air vents 6. Isolate HVAC system	1. Wipe work surfaces with disinfectant 2. Contain waste before transport in covered containers 3. Wet mop or Vacuum (HEPA filtered) before leaving 4. Restore HVAC system

Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

INFECTION CONTROL PRECAUTIONS BY CLASS

During Construction	Upon Completion
ALL CLASS I, II plus 1. Isolate HVAC 2. Construct critical barriers 3. Maintain negative pressure, HEPA equipped air filtration units 4. Contain construction waste in tightly covered containers	1. Do not remove barriers until project completed, inspected and cleaned 2. Remove barriers carefully to minimize dust dispersal 3. Vacuum (HEPA filtered) work area 4. Wet mop area w/ disinfectant 5. Restore HVAC

Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

INFECTION CONTROL PRECAUTIONS BY CLASS

IV

During Construction	Upon Completion
ALL CLASS I, II, III plus 1. Seal all holes, pipes, and conduits 2. Construct Anteroom at entrance, must vacuum off prior to exiting or wear coveralls 3. All personnel wear shoe covers. Covers removed at exit	1. Do not remove barriers until project completed, inspected and cleaned 2. Remove barriers carefully to minimize dust dispersal 3. Vacuum (HEPA filtered) work area 4. Wet mop area w/ disinfectant 5. Restore HVAC

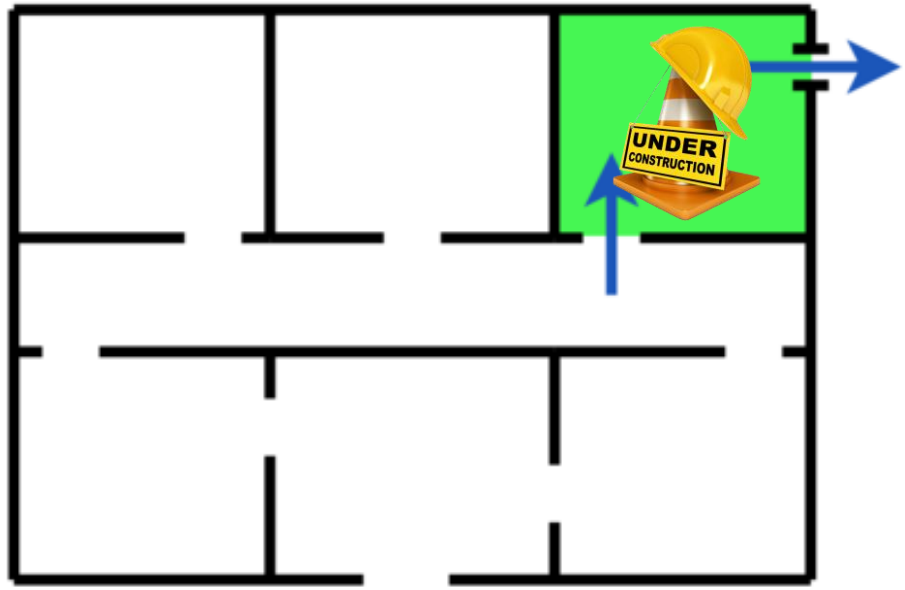
Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

INFECTION CONTROL MEASURES- CONTROLLING AIR FLOW

Ventilation of the Construction Space

Airflow into the construction zone from occupied spaces by dedicated ventilation/exhaust system for the construction area

- Location of exhaust discharges, fresh air intakes, sealing of existing air ducts
- Use of existing building systems
- Visible display of negative pressure



Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation.

INFECTION CONTROL MEASURES- CONTROLLING DUST

- Mats changed weekly
- HEPA vacuum only-documentation from construction company
- Particle counter
  - Baseline
  - Daily
  - HEPA units/filter
    - # of particles going in
    - # of particles coming out

INFECTION CONTROL MEASURES
WALK OFF MAT

INFECTION CONTROL MEASURES
BARRIERS

INFECTION CONTROL MEASURES
CEILING WORK

https://spice.unc.edu/ask-spice/

SPICE

RESOURCES

- Association for Professionals in Infection Control and Epidemiology (APIC). (2015). Infection Control Manual for Construction & Renovation.
- Balm, M., Teo, C., Jureen, R., Lin, R., & Fisher, D. (2011). Massive hospital-wide bacillus outbreak related to hospital linen and construction. *BMC Proceedings*, *5*(Suppl 6), O77. https://doi.org/10.1186/1753-6561-5-S6-O77
- CDC Aspergillosis: https://www.cdc.gov/fungal/diseases/aspergillosis
- CDC Guideline for Environmental Infection Control in Healthcare Facilities, 2003. MMWR. 52: RR-10:1-44.
- Cook, Evelyn (2018). Infection Control Issues Construction and Renovation Water and Mold Remediation. Presentation https://spice.unc.edu/wp-content/uploads/2018/10/09-Construction-and-Renovation-2018.pdf
- Hajime Kanamori, William A. Rutala, Emily E. Sickbert-Bennett, David J. Weber, Review of Fungal Outbreaks and Infection Prevention in Healthcare Settings During Construction and Renovation, *Clinical Infectious Diseases*, Volume 61, Issue 3, 1 August 2015, Pages 433–444, https://doi.org/10.1093/cid/civ297
- R. P. Vonberg, P. Gastmeier (2006),Nosocomial aspergillosis in outbreak settings, *Journal of Hospital Infection*, Volume 63, Issue 3, https://doi.org/10.1016/j.jhin.2006.02.014
- Rutala, William. What are the Risks Associated with Construction and Renovation in Healthcare Settings? Presentation. Retrieved from https://vtwqt464m234djrhbie88e10-wpengine.netdna-ssl.com/wp-content/uploads/2019/03/Risks-Associated-with-Construction-and-Renovation.pdf