RECOMMENDED PRACTICES TO INTERRUPT TRANSMISSION OF INFECTIOUS AGENTS

Evelyn Cook, RN, CIC
Associate Director
NC Statewide Program for Infection Control and Epidemiology (SPICE)

1

Objectives

- Review CDC Guidelines
- Review Standard Precautions and TBP
- Discuss Management of Multi-drug Resistant Organisms

2

HISTORY OF ISOLATION PRECAUTIONS

- 1983 CDC Isolation Precautions in Hospital

Category-based precautions (Airborne Isolation, Droplet and Contact) plus blood and body fluids precautions

- 1985 Introduced Universal Precautions all patients considered infectious regardless of testing *(OSHA uses term universal precautions in BBP rule)*
- 1987 Body Substance Isolation
  - focused on worker protection
- 1996 CDC HICPAC Revised Isolation Guidelines
  - Introduced Standard Precautions and kept 3 categories of transmission-based precautions

3

GUIDANCE DOCUMENTS

- 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings- **revised and added**:
  - Safe Injection Practices
  - Respiratory Hygiene/Cough Etiquette
  - Use of mask during spinal procedures
- Management of Multi-drug resistant organisms (2006)
- Implementation of Personal Protective Equipment (PPE) use in nursing homes to prevent spread of multidrug-resistant organisms (6/22)
  - EBPs
  - QSO-24-8-NH (3/20/24)

4

KEY CONCEPTS

- Risk of transmission of infectious agents occurs in all settings
- Infections are transmitted from patient-to-patient via HCPs hands or medical equipment/devices
- Unidentified patients who are colonized or infected may represent risk to other patients
- Isolation precautions are **only part** of a comprehensive IP program

5

FUNDAMENTAL ELEMENTS -

- Administrative support
- **Adequate Infection Prevention staffing**
- Good communication with clinical microbiology lab and environmental services
- A comprehensive educational program for HCPs, patients, and visitors
- **Infrastructure support** for surveillance, outbreak tracking, and data management

6

CONTROLLING TRANSMISSION OF INFECTION

If there is a **means of transmission**, infection will spread to others.

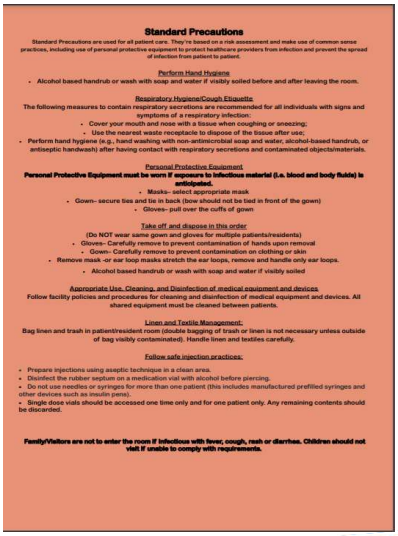
Standard Precautions

Transmission-Based Precautions

SPICE

7

STANDARD PRECAUTIONS



SPICE

8

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

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

Acknowledgement: The authors and HICPAC gratefully acknowledge Dr. Larry Strausbaugh for his many contributions and valued guidance in the preparation of this guideline.

Suggested citation: Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings
http://www.cdc.gov/ncidod/dhqp/pdf/isolation2007.pdf

- ***Implementation of Standard Precautions constitutes the primary strategy for the prevention of healthcare-associated transmission of infectious agents among patients and healthcare personnel***

9

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 with proteinaceous material 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***

10

How to hand wash

11

ALCOHOL BASED HAND RUB

- ***Unless hands are visibly soiled, an alcohol-based hand sanitizer is preferred over soap and water in most clinical situations.***

12

How to hand rub

SPICE

13

HAND HYGIENE PROGRAM

ESSENTIAL PRACTICES = QUALITY OF EVIDENCE HIGH

- Promote the preferential use of ABHS in most clinical situations
- Perform HH as indicated by CDC **OR** the WHO Five moments
- HCP who provide direct or indirect care in high-risk areas (e.g, ICU, perioperative) should not wear artificial fingernail extenders
- Engage all HCP in primary prevention of occupational irritant and allergic contact dermatitis
- Provide facility-approved hand moisturizer that is compatible with antiseptics and gloves
- For routine hand hygiene, choose liquid, gel or foam ABHS with at least 60% alcohol

https://doi.org/10.1017/ice.2022.304

SPICE

14

HAND HYGIENE PROGRAM

ESSENTIAL PRACTICES = QUALITY OF EVIDENCE HIGH

- Involve HCP in selection of products
- Educate HCP about an appropriate volume of ABHS and the time required to obtain effectiveness
- Ensure that ABHS dispensers are unambiguous, visible, and accessible within the workflow of HCP
- In private rooms, consider 2 ABHS dispensers the minimum threshold for adequate number of dispensers: 1 dispenser in the hallway, and 1 in the patient room

https://doi.org/10.1017/ice.2022.304

15

HAND HYGIENE PROGRAM

ESSENTIAL PRACTICES = QUALITY OF EVIDENCE HIGH

- Educate HCP about the potential for self-contamination and environmental contamination when gloves are worn
- *Clean hands immediately following glove removal. If handwashing is indicated (C. difficile, norovirus) and sinks are not immediately available, use ABHS and then wash hands as soon as possible.*
- Educate and confirm the ability of HCP to doff gloves in a manner that avoids contamination.
- Take steps to reduce environmental contamination associated with sinks and sink drains
- ***Do not keep medications or patient care supplies on countertops or mobile surfaces that are within 1 m (3 feet) of sinks***
- Monitor adherence to hand hygiene

https://doi.org/10.1017/ice.2022.304

16

APPROACHES THAT SHOULD NOT BE CONSIDERED A ROUTINE PART OF HH

- Do not supply individual pocket-sized 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

https://doi.org/10.1017/ice.2022.304

SPICE

17

STANDARD PRECAUTIONS

Component	Recommendation
Personal Protective Equipment (PPE)	
Gloves 	For touching blood, body fluids, secretions, excretions, contaminated items; for touching mucous membranes and non-intact skin
Gown 	During procedures and resident-care activities when contact of clothing/exposed skin with blood/body fluids, secretions, and excretions is anticipated
Mask, eye protection 	During procedures and resident-care activities likely to generate splashes or sprays of blood, body fluids, secretions, especially suctioning, endotracheal intubation

SPICE

18

USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

- Perform and maintain an inventory of PPE – monitor daily PPE use
- Make necessary PPE available where patient care is provided
- Position trash can near the exit inside the room for disposal
- Implement strategies to optimize current PPE supply – even before shortages occur

19

USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

- Three overriding principals related to personal protective equipment (PPE)
  - Wear PPE when the nature of the anticipated patient interaction indicates that contact with blood or body fluids may occur
  - Prevent contamination of clothing and skin during the process of removing PPE
  - ***Before leaving the patient's room, remove and discard PPE –respirators removed after leaving***

20

SAFE WORK PRACTICES (PPE USE)

- ✓ Keep hands away from face
- ✓ Work from clean to dirty
- ✓ Limit surfaces touched
- ✓ Change when torn or heavily contaminated
- ✓ Perform hand hygiene

SPICE

21

SPICE

22

Component	Recommendation
Soiled equipment	Handle in a manner that prevents transfer of microorganisms to others and to the environment; wear gloves if visibly contaminated; perform hand hygiene
Environmental Control	Develop procedures for routine care, cleaning, and disinfection of environmental surfaces, especially frequently touched surfaces in resident-care areas
Laundry	Handle in a manner that prevents transfer of microorganisms to others and to the environment
Needles and sharps	Do not recap, bend, break, or hand-manipulate used needles; if recapping is required, use a one-handed scoop technique only; use safety features when available; place used sharps in puncture-resistant container
Resident Resuscitation	Use mouthpiece, resuscitation bag, other ventilation devices to prevent contact with mouth and oral secretions

23

Component	Recommendation
Patient placement	Prioritize for single room if patient is at ***increased risk of transmission, is likely to contaminate the environment, does not maintain appropriate hygiene, or is at increased risk of acquiring infection or developing adverse outcome following infection*.**
Respiratory hygiene/cough etiquette (source containment of infectious respiratory secretions in symptomatic persons, beginning at initial point of encounter)	Instruct symptomatic persons to cover mouth/nose when sneezing/coughing; use tissues and dispose in no-touch receptacle; observe hand hygiene after soiling of hands with respiratory secretions; wear surgical mask if tolerated or maintain spatial separation, >3 feet if possible.

24

Component	Recommendation
Safe Injection Practices	Apply to the use of needles, cannulas that replace needles, and, where applicable intravenous delivery systems • Use aseptic technique • Needles, cannulae and syringes are sterile, single-use items • Use single-dose vials for parenteral medications whenever possible • Do not administer medications form single-dose vials or ampules to multiple residents • Do not keep multidose vials in the immediate resident treatment area • Do not use bags or bottles of IV solution as a common source of supply for multiple residents
Special Lumbar Procedures	Wear a surgical mask when placing a catheter or injecting material into the spinal canal or subdural space

25

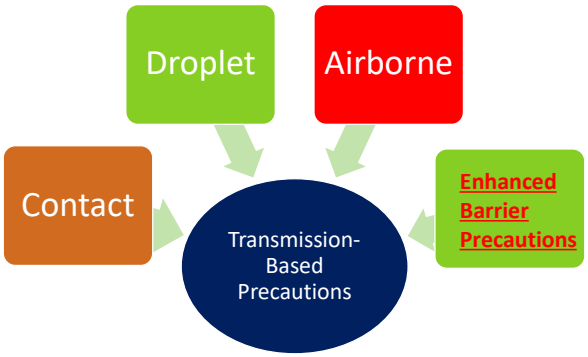
RECOMMENDED PRACTICES TO REDUCE TRANSMISSION IN ALL SHARED ROOMS

- When patients are placed in shared rooms, facilities must implement strategies to help minimize transmission between roommates.
- These strategies apply for all shared rooms, regardless of patient colonization or infection status:
  - Maintain separation of at least 3 feet between beds.
  - Use privacy curtains to limit direct contact.
  - Clean and disinfect as if each bed area were a different room. For example:
    - Clean and disinfect any shared or reusable equipment.
    - Change mopheads, cleaning cloths, and other cleaning equipment between bed areas.
  - Clean and disinfect environmental surfaces on a more frequent schedule.
  - Have healthcare personnel change personal protective equipment (if worn), including gloves, and perform hand hygiene before and after interaction with each roommate.

https://www.cdc.gov/fungal/candida-auris/c-auris-infection-control.html#:~:text=Healthcare%20providers%20can%20find%20recommendations,together%20in%20the%20same%20room.

26

TRANSMISSION BASED PRECAUTIONS



Transmission-Based Precautions are for patients who are known or suspected to be infected or colonized with infectious agents, including certain epidemiologically important pathogens, and are used when the route(s) of transmission are not completely interrupted using Standard Precautions alone.

SPICE

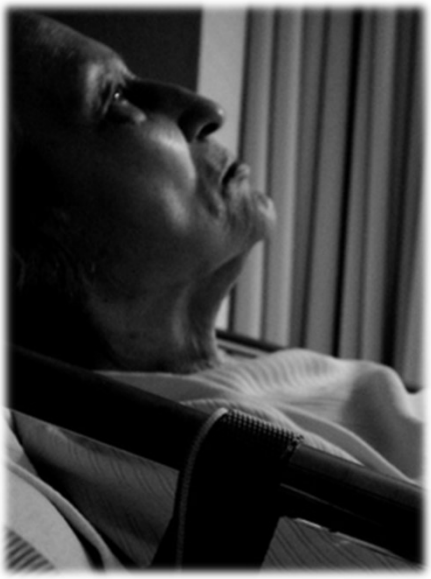
27

SOURCES OF INFECTION

- Humans
  - Patients
  - Healthcare Personnel
  - Visitors/household members
- Environmental
- Common Vehicles
- Vectorborne

SPICE

28



Host Factors

Age

Immobility

Incontinence

Dysphagia

Chronic Diseases

Poor Functional Status

Medications

Indwelling devices

SPICE

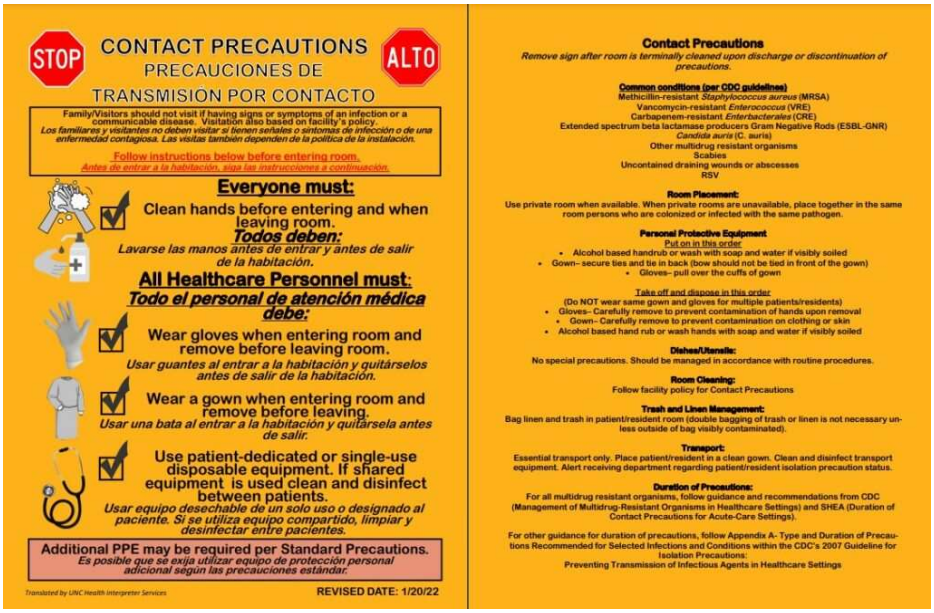
29

ROUTES OF TRANSMISSION

- Direct Contact
- Indirect Contact
- Droplet
- Aerosol (Airborne)

SPICE

30



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.

Translated by UNC Health Interpreter Services

REVISED DATE: 1/20/22

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

Common conditions (per CDC guidelines)
Methicillin-resistant *Staphylococcus aureus* (MRSA)
Vancomycin-resistant *Enterococcus* (VRE)
Carbapenem-resistant *Enterbacterales* (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

SPICE

31

DIRECT AND INDIRECT CONTACT TRANSMISSION

DIRECT CONTACT: SKIN TO SKIN TOUCHING

INDIRECT CONTACT: INANIMATE SURFACES

SPICE

32

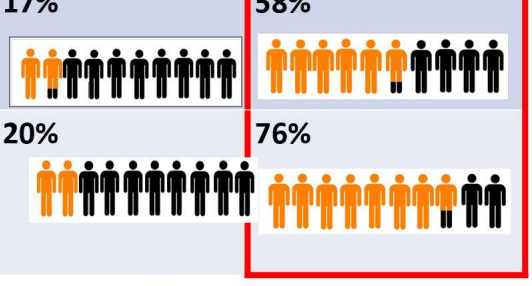
CONTACT PRECAUTIONS

- Common conditions:
  - MRSA,
  - VRE,
  - CRE,
  - ESBL-GNR,
  - *Candida auris*,
  - Scabies,
  - Uncontained draining wounds or abscesses
- Private room if available
- ***Don gown and gloves when entering the room***
- Disposable or dedicated equipment
- Transport patients in a fresh gown

33

The Large Burden of MDROs in Nursing Homes

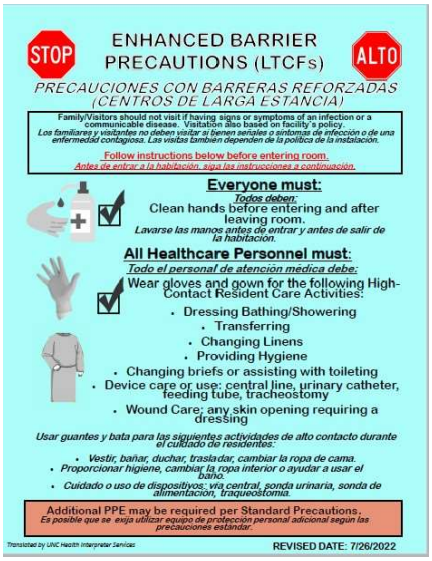
Facility Type	Documented MDRO	Actual MDRO
Nursing Homes (n = 14)	17%	58%
Ventilator-Capable Nursing Homes (n = 4)	20%	76%



McKinnell JA et al, Clin Infect Dis. 2019; 69(9):1566-1573

Slide acknowledgement CDC presentation

34



ENHANCED BARRIER PRECAUTIONS (LTCFs)

PRECAUCIONES CON BARRERAS REFORZADAS (CENTROS DE LARGA ESTANCIA)

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:
Todos deben:
Clean hands before entering and after leaving room.
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 and gown for the following High-Contact Resident Care Activities:

- Dressing Bathing/Showering
- Transferring
- Changing Linens
- Providing Hygiene
- Changing briefs or assisting with toileting
- Device care or use: central line, urinary catheter, feeding tube, tracheostomy
- Wound Care; any skin opening requiring a dressing

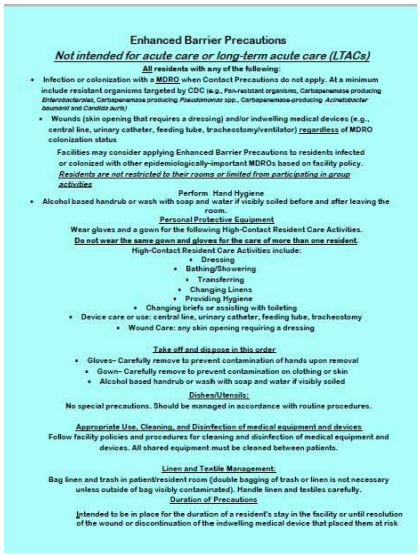
Usar guantes y bata para las siguientes actividades de alto contacto durante el cuidado de residentes:

- *Vestir, bañar, duchar, trasladar, cambiar la ropa de cama.*
- *Proporcionar higiene, cambiar la ropa interior o ayudar a usar el baño.*
- *Cuidado o uso de dispositivos: vía central, sonda urinaria, sonda de alimentación, traqueostomía.*

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: 7/26/2022



Enhanced Barrier Precautions

Not intended for acute care or long-term acute care (LTACs)

All residents with any of the following:

- Infection or colonization with a MDRO when Contact Precautions do not apply. At a minimum include resistant organisms targeted by CDC (e.g., Pan-resistant organisms, Carbapenemase producing *Enterobacterales*, Carbapenemase producing *Pseudomonas* spp., Carbapenemase-producing *Acinetobacter baumanii* and *Candida auris*)
- Wounds (skin opening that requires a dressing) and/or indwelling medical devices (e.g., central line, urinary catheter, feeding tube, tracheostomy/ventilator) regardless of MDRO colonization status

Facilities may consider applying Enhanced Barrier Precautions to residents infected or colonized with other epidemiologically-important MDROs based on facility policy.
Residents are not restricted to their rooms or limited from participating in group activities

Perform Hand Hygiene

- Alcohol based handrub or wash with soap and water if visibly soiled before and after leaving the room.

Personal Protective Equipment
Wear gloves and a gown for the following High-Contact Resident Care Activities.
Do not wear the same gown and gloves for the care of more than one resident.
High-Contact Resident Care Activities include:

- Dressing
- Bathing/Showering
- Transferring
- Changing Linens
- Providing Hygiene
- Changing briefs or assisting with toileting
- Device care or use: central line, urinary catheter, feeding tube, tracheostomy
- Wound Care: any skin opening requiring a dressing

Take off and dispose in this order

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

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

Appropriate Use, Cleaning, and Disinfection of medical equipment and devices
Follow facility policies and procedures for cleaning and disinfection of medical equipment and devices. All shared equipment must be cleaned between patients.

Linen and Textile Management:
Bag linen and trash in patient/resident room (double bagging of trash or linen is not necessary unless outside of bag visibly contaminated). Handle linen and textiles carefully.
Duration of Precautions
Intended to be in place for the duration of a resident's stay in the facility or until resolution of the wound or discontinuation of the indwelling medical device that placed them at risk

SPICE

35

Implementation of Personal Protective Equipment (PPE) Use in Nursing Homes to Prevent Spread of Multidrug-resistant Organisms (MDROs)

Print version: Implementation of PPE in Nursing Homes to Prevent Spread of MDROs [PDF – 7 pages]

Summary of Recent Changes:

- Added additional rationale for the use of Enhanced Barrier Precautions (EBP) in nursing homes, including the high prevalence of multidrug-resistant organism (MDRO) colonization among residents in this setting.
- Expanded residents for whom EBP applies to include any resident with an indwelling medical device or wound (regardless of MDRO colonization or infection status).
- Expanded MDROs for which EBP applies.
- Clarified that, in the majority of situations, EBP are to be continued for the duration of a resident's admission.

On this Page

Resources

https://www.cdc.gov/hai/containment/PPE-Nursing-Homes.html

SPICE

36

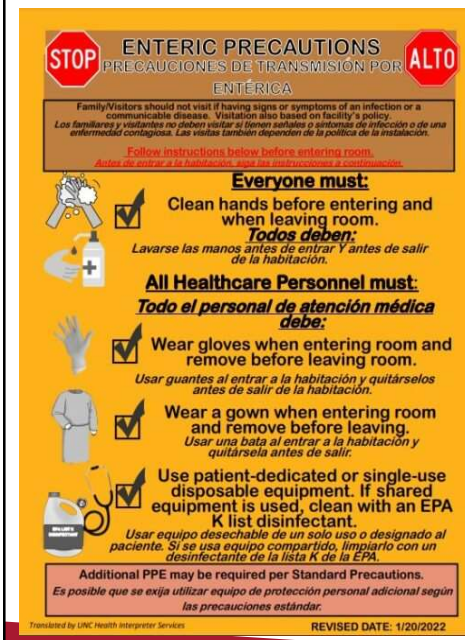
MDROs TARGETED BY CDC 2019

- Pan-resistant organisms:
  - Resistant to all current antibacterial agents *Acinetobacter, Klebsiella pneumonia, pseudomonas aeruginosa*
- Carbapenemase-producing Enterobacterales
- Carbapenemase-producing *Pseudomonas* spp.
- Carbapenemase-producing *Acinetobacter baumannii* and
- *Candida auris*

July 2022:

- **Expanded MDROs for which EPBs apply (MRSA, VRE etc.,)**
- **Expanded residents for whom EPBs applies to include any resident with an indwelling medical device or wound (regardless of MDRO colonization or infection status)**
- **EPB are to be continued for the duration of the resident's stay**

37



38

CONTACT → ENTERIC PRECAUTIONS

- Common conditions:
  - *Clostridioides difficile*,
  - Norovirus,
  - Rotovirus
- **USE ABHR for routine care.**
- During an outbreak, HCP should consider using soap & water routinely

- Private room if possible
- Gown and gloves
- Disposable or dedicated equipment
- Use EPA agent from the K list of disinfectants: Dilute Bleach , sporicidal disinfectants.

39

STOP DROPLET PRECAUTIONS ALTO
PRECAUCIONES DE TRANSMISION POR GOTAS

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 al salir de la habitación.

Wear surgical/procedure mask when entering the room and remove after exiting the room.

Usar una mascarilla quirúrgica o para procedimientos al entrar a la habitación y quitársela después de salir de la habitación.

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

Translated by UNC Health Interpreter Services

REVISED DATE: 1/20/2022

Droplet Precautions

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

Common conditions (per CDC guidelines)

B. pertussis (Whooping cough)
Influenza virus
Rhinovirus
Known or suspected *Neisseria meningitides* (meningoccoccal) and *H. influenza* meningitis
Mumps
Rubella
Parvovirus B19

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.
Spatial separation of ≥3 feet and drawing the curtain between patient beds is especially important for patients in multi-bed rooms with infections transmitted by the droplet route.

Personal Protective Equipment
Put on in this order
- Alcohol based handrub or wash with soap and water if visibly soiled

Mask– Cover nose, mouth, and chin. If wearing a mask with ties, all ties must be secured.

Take off and dispose in this order
- Mask– Do NOT grasp front of the mask when removing. Grasp bottom ties then the ties at top and pull away from face. For ear loop masks stretch the ear loops, remove, and handle only ear loops.
- 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 Droplet 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 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

40

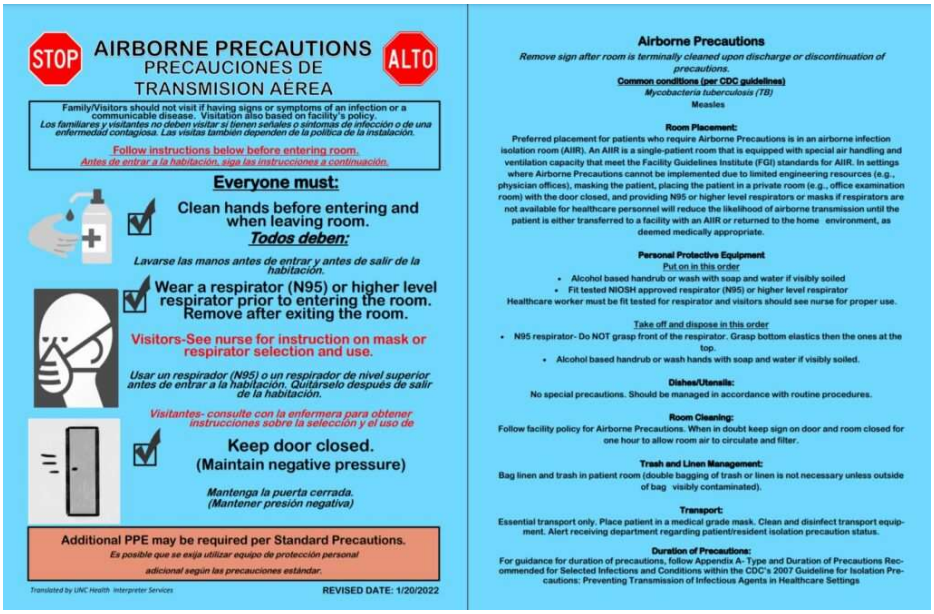
DROPLET PRECAUTIONS

Applies when respiratory droplets contain pathogens which may be spread to another susceptible individual

- Common conditions:
  - Pertussis,
  - Influenza,
  - Rhinovirus,
  - Neisseria meningitides,
  - Mumps,
  - Rubella,
  - Parvovirus B19

- Surgical or procedure mask upon entering the room
- Private room when available
- Transport patient in a medical grade mask.

41



STOP AIRBORNE PRECAUTIONS ALTO
PRECAUCIONES DE TRANSMISION AEREA

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

42

AIRBORNE PRECAUTIONS

Occurs when pathogens are so small, they can easily be dispersed in the air over long distances by air currents.

- Common conditions:
  - Tuberculosis,
  - Measles

Private room only

Room requires Negative airflow pressure

Doors must remain closed

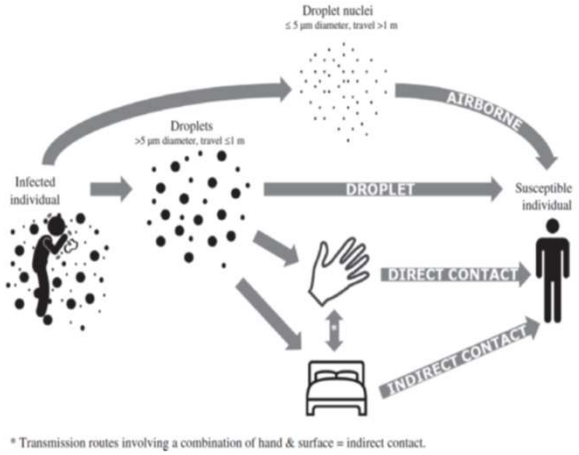
Everyone must wear an N-95 respirator

Limit the movement and transport of the patient

43

TRANSMISSION-BASED PRECAUTIONS

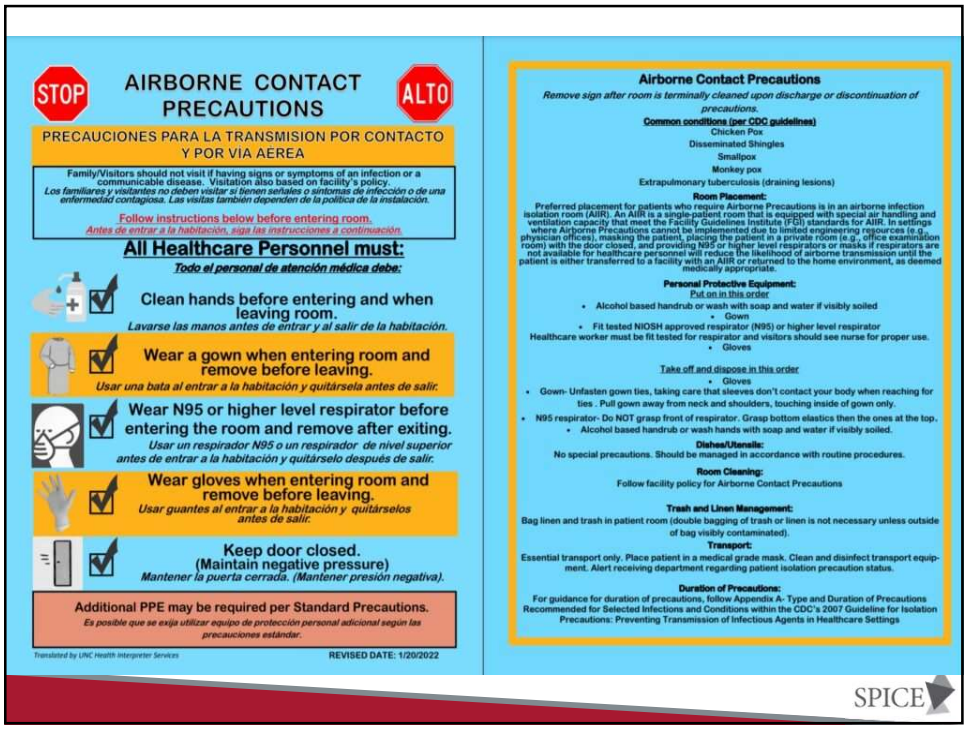
- Combinations of precautions may be necessary based on the pathogen:
  - **Droplet plus Contact**
  - **Airborne plus Contact**



* Transmission routes involving a combination of hand & surface = indirect contact.

1Proceianoy RS, et al. J Pediatr (Rio J) 2002;11 April; 2 Almendros A, et al. Vet Rec 2020;4; 3Chin AWH, et al David Weber: Associate Chief Medical Officer, UNC Hospitals; Medical Director, Hospital Epidemiology: COVID-19 (SARS Co-V-2) Update

44



STOP

AIRBORNE CONTACT PRECAUTIONS

ALTO

PRECAUCIONES PARA LA TRANSMISION POR CONTACTO Y POR VIA AEREA

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.

All Healthcare Personnel must:
Todo el personal de atención médica debe:

Clean hands before entering and when leaving room.
Lavarse las manos antes de entrar y al 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.

Wear N95 or higher level respirator before entering the room and remove after exiting.
Usar un respirador N95 o un respirador de nivel superior antes de entrar a la habitación y quitárselo después de salir.

Wear gloves when entering room and remove before leaving.
Usar guantes al entrar a la habitación y quitárselos antes de salir.

Keep door closed. (Maintain negative pressure)
Mantener 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 Contact Precautions

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

Common conditions (per CDC guidelines)
Chicken Pox
Disseminated Shingles
Smallpox
Monkey pox
Extrapulmonary tuberculosis (draining lesions)

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
- Gown
- 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.
- Gloves

Take off and dispose in this order
- Gloves
- Gown- 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.
- N95 respirator- Do NOT grasp front of 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 Contact Precautions

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 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

SPICE

45

AIRBORNE CONTACT PRECAUTIONS

- Common conditions:
  - Chicken Pox
  - Disseminated Shingles
  - Smallpox
  - Monkey pox
  - Extrapulmonary tuberculosis (draining lesions)
- AIIR- single-patient room with special air handling and ventilation capacity that meet the Facility Guidelines Institute (FGI) standards.
- N95 or higher respirator
- Essential transport only with patient wearing a medical grade mask
- Upon discharge allow at least one hour for air to circulate

SPICE

46

1. Airborne Contaminant Removal

Table B.1. Air changes/hour (ACH) and time required for airborne-contaminant removal by efficiency *

ACH § ¶	Time (mins.) required for removal 99% efficiency	Time (mins.) required for removal 99.9% efficiency
2	138	207
4	69	104
6+	46	69
8	35	52
10+	28	41
12+	23	35
15+	18	28
20	14	21
50	6	8

* This table is revised from Table S3-1 in reference 4 and has been adapted from the formula for the rate of purging airborne contaminants presented in reference 1435.

https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html#b1

SPICE

47

48

DROPLET CONTACT PRECAUTIONS

- Common conditions:
  - Rhinovirus if associated with copious secretions,
  - Invasive group A streptococcal infection associated with soft tissue involvement
  - Certain coronaviruses
  - RSV (infants and young children)
- Private room or keep >3 spatial separation
- Surgical or procedure mask when entering room
- Gown and gloves on room entry and remove when leaving room
- Essential transport with patient in a medical grade mask and clean gown

49

50

SPECIAL DROPLET CONTACT PRECAUTIONS
(PRIMARILY FOR NURSING HOMES)

- Common conditions:
  - SARS,
  - SAR-CoV-2 (COVID-19)
- Private room with door closed unless fall risk.
- Fit tested N95 or higher respirator
- Protective eyewear
- Gown and gloves
- Essential transport only with resident-resident wearing a medical grade mask

51

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 2018***

Type and Duration of Precautions Recommended for Selected Infections and Conditions[1]

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

Appendix A Updates [September 2018]

Changes: Updates and clarifications made to the table in Appendix A: Type and Duration of Precautions Recommended for Selected Infections and Conditions.

A B C D E F G H I J K L M N O P Q R S T U V W Y Z

A

Infection/Condition	Type of Precaution	Duration of Precaution	Precautions/Comments
Abscess Draining, major	Contact + Standard	Duration of illness	Until drainage stops or can be contained by dressing.

52

53

RISK FACTORS FOR DEVELOPING A MDRO

- Duration of hospitalization
- High rates of transfer in and between hospitals
- Local institution risk factors
- Long term care facilities
- Intensive care units
- High rate of device utilization
- Colonization
- Prior antibiotic use

"Age, comorbid illnesses, invasive medical devices, frequent antibiotic exposure, and dependence on healthcare workers, in the setting of communal living, all serve to increase the risk of nursing home residents becoming colonized or infected with healthcare-acquired bacterial pathogens. "
(Dumyati, et. Al., 2017)

SPICE

54

MDROS SPREAD IN HEALTHCARE SETTINGS

- Patient to patient transmission via healthcare provider's hands
- Environmental/equipment contamination

X marks the location where VRE was isolated in the room

Image from Abstract: The risk of hand and glove contamination after contact with a VRE + resident environment. Hayden M, ICAAC, 2001, Chicago, Il.

55

CANDIDA AURIS: AN OVERVIEW, CDC

- *Candida auris* is an emerging fungus that presents a serious global health threat for the following reasons:
  - *C. auris* is spreading geographically and increasing in incidence.
  - *C. auris* may colonize patients for months to years (no method of decolonization). Infection (usually candidemia) has a high mortality (~60%).
  - It is often multidrug-resistant (e.g., echinocandins, triazoles, polyene {amphotericin B}). Some strains are resistant to all three available classes of antifungals.
  - It is difficult to identify with standard laboratory methods, and it can be misidentified in labs without specific technology. Misidentification may lead to inappropriate management.
  - It has caused multiple outbreaks in healthcare settings. For this reason, it is important to quickly identify *C. auris* in a hospitalized patient so that healthcare facilities can take special precautions to stop its spread.

Acknowledgement: Dr. David Weber MD, MPH, FIDSA, FSHEA, FRSM: Emerging Infectious Disease: *Candida Auris*-SPICE webinar (3/15/23)

56

CANDIDA AURIS: AN OVERVIEW, CDC

- May 11, 2021: Updated Tracking *C. auris* to include historical and current U.S. interactive maps and downloadable datasets
- July 19, 2021: Environmental Protection Agency (EPA) has created List P, a list of EPA-registered disinfectants effective against *C. auris*
- Current needs: (1) rapid diagnostics; (2) new drugs; (3) decolonization methods; (4) registered, easy to use and effective disinfectants; (5) other tools or protocols for treatment and prevention

Acknowledgement: Dr. David Weber MD, MPH, FIDSA, FSHEA, FRSM: Emerging Infectious Disease: *Candida Auris*-SPICE webinar (3/15/23)

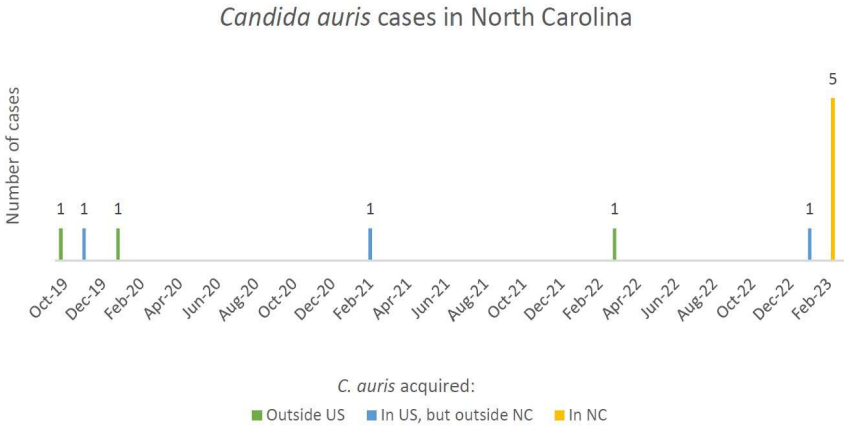
57

CANDIDA AURIS: EPIDEMIOLOGY

- First isolated in 2009 from ear discharge of a female patient in Japan; now reported in >45 countries worldwide
- Healthcare-associated outbreaks common
- Mortality ~65%-70%
- Primarily infects the usual spectrum of compromised individuals including those with uncontrolled diabetes mellitus, chronic renal diseases, neutropenia, and those on immunosuppressive therapy, broad-spectrum antimicrobials, and those with indwelling medical devices, or at extremes of age.
- Causes an array of human diseases ranging from fungemias, surgical/nonsurgical wound infections, urinary tract infections, meningitis, myocarditis, skin abscesses, to bone infections.

Acknowledgement: Dr. David Weber MD, MPH, FIDSA, FSHEA, FRSM: Emerging Infectious Disease: *Candida Auris*-SPICE webinar (3/15/23)

58



59

CANDIDA AURIS: INFECTION CONTROL

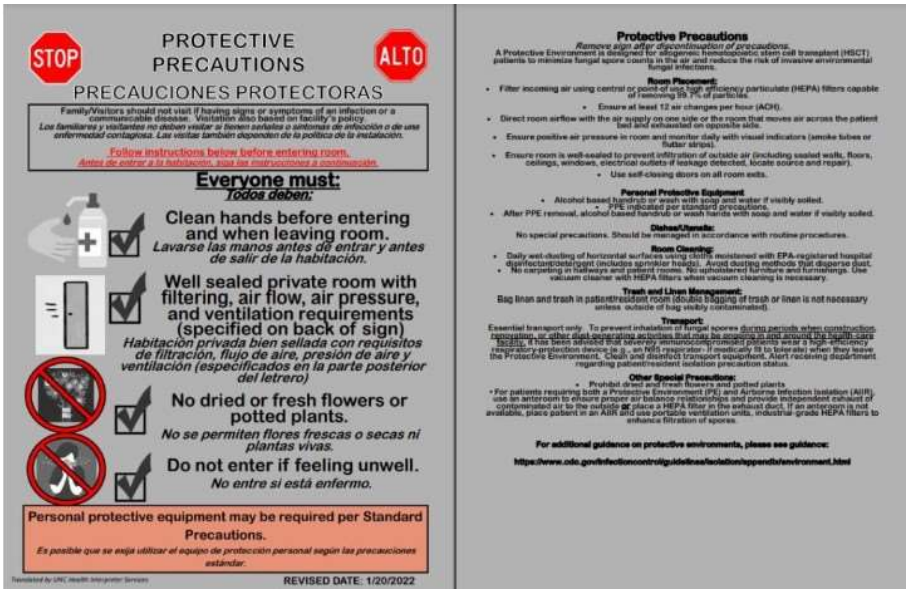
- Place any patients with suspected or confirmed *C. auris* on contact precautions in a single-patient room immediately.
- *C. auris* is known to widely contaminate the environment and can persist in the environment for several weeks. Conduct daily and terminal environmental cleaning using a disinfectant on EPA's List P. ***(NCDHHS memo 3/30/23)***
- Healthcare providers should use **Contact Precautions** to manage patients with *C. auris* in acute care hospitals and long-term acute care hospitals. Manage residents with *C. auris* in nursing homes, including skilled nursing facilities, using either **Contact Precautions or Enhanced Barrier Precautions**, depending on the situation and local or state jurisdiction recommendations. (**CDC 1/23**)

60

KEY MDRO PREVENTION STRATEGIES

- Assessing hand hygiene practices
- Quickly reporting MDRO lab results
- Implementing Contact Precautions
- Recognizing previously colonized patients
- Strategically place patients based on MDRO risk factors
- Careful device utilization
- Antibiotic stewardship
- Inter-facility communication

61



62

PROTECTIVE ENVIRONMENT

- Designed for allogenic Hematopoietic Stem Cell Transplant (HSCT) patients to minimize fungal spore counts in the air and reduce the risk of invasive environmental fungal infections
- Environmental Controls:
  - HEPA filtration of incoming air
  - Directed room air flow
  - Positive pressure in relationship to corridor
  - Well-sealed rooms (i.e., walls, floors, ceilings, windows, electrical outlets)
  - ≥ 12 air changes per hour
  - Minimize dust
  - Prohibiting dried and fresh flowers and potted plants

SPICE

63

STOP

NEUTROPENIC PRECAUTIONS

ALTO

Not included in CDC's Guidelines for Isolation Precautions

PRECAUCIONES NEUTROPENICAS

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:
Todos deben:

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

Avoid raw or under cooked fruits or vegetables; raw or undercooked eggs or shellfish
Evitar las frutas y verduras crudas o poco cocidas; los huevos o mariscos crudos o poco cocidos.

No live flowers or plants.
No se permiten flores ni plantas vivas.

Do not enter if feeling unwell.
No entre si está enfermo.

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

Neutropenic Precautions

Neutropenia — The definition of neutropenia varies from institution to institution, but neutropenia is usually defined as an absolute neutrophil count (ANC) <1500 or 1000 cells/microL and severe neutropenia as an ANC <500 cells/microL or an ANC that is expected to decrease to <500 cells/microL over the next 48 hours [2,3]. Profound neutropenia is defined as an ANC <100 cells/microL. The risk of clinically important infection rises as the neutrophil count falls below 500 cells/microL and is higher in those with a prolonged duration of neutropenia (>7 days).

Room Placement:
Use private room when available.

Personal Protective Equipment
Per Standard Precautions

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

Room Cleaning:
Follow facility policy for Neutropenic 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 medical grade mask. Clean and disinfect transport equipment. Alert receiving department regarding patient/resident isolation precaution status.

Other Special Precautions:
- No live flowers or plants.
- Do not enter if feeling unwell.
- Avoid fresh uncooked fruits and vegetables (cooked fruits and vegetables are okay), raw or undercooked eggs or shellfish. Only use desiccated pepper.

SPICE

64

NEUTROPENIC PRECAUTIONS

- Absolute neutrophil count (ANC) < 1500 or AMC expected to decrease to <500 over next 48 hours
- Private room if available
- Routine room cleaning
- Avoid raw or undercooked fruits, eggs, vegetables, or shellfish or cracked pepper
- No live flowers or plants
- ***No staff or visitors' entry if ill***
- Surgical mask if leaving room

65

FRONT/BACK POCKET CARD: (PRINTS A 2-PAGE DOCUMENT TO BE TRIMMED/LAMINATED)

HTTPS://SPICE.UNC.EDU/RESOURCES/NC-STANDARDIZED-ISOLATION-SIGNAGE/

66

SUMMARY

- Standard precautions are the primary strategy to interrupt transmission of infectious agents in healthcare facilities
  - HH,PPE, Respiratory Hygiene, Cleaning of Equipment and Environment
- Transmission-based precautions may also need to be implemented based on the type of infection and how it is transmitted
  - Contact, Droplet, Airborne and a combination of these
  - Enhanced Barrier Precautions
- CDC Guidance specific to multi-drug resistant organisms
  - 2006-Management of MDROs
  - Enhanced Barrier Precautions - 2022

SPICE

67

SPICE

68