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### **(1C) Surveillance and Prevention of *Clostridium difficile* Infections in the Long-Term Care Setting**

**Introduction:** *Clostridium difficile* is a gram positive, anaerobic, spore-forming, toxigenic bacterium and the most common cause of healthcare-acquired diarrhea in the long-term care setting. The severity of *Clostridium difficile* infections (CDI) ranges from uncomplicated diarrhea to pseudomembranous colitis and toxic megacolon, which can lead to sepsis and death. Risk factors for acquiring CDI include exposure to antimicrobial therapy (particularly beta-lactam agents), gastrointestinal procedures, advanced age, immunocompromising conditions, serious underlying illness, long length of stay in healthcare settings, and indiscriminate use of antimicrobials. Antimicrobials most frequently associated with increased risk of *C. difficile* include third generation cephalosporins, clindamycin, vancomycin, and fluoroquinolones. Restricting the use of antimicrobial agents has been the most successful measure to prevent the development of CDI.

Due to age-related immunity factors and frequent antimicrobial exposure, the elderly are at increased risk for developing CDI. While nearly half of CDI cases occur in people younger than 65, more than 90% of deaths occur in people 65 and older. Annually in the United States, CDI is linked to 14,000 deaths and at least \$1 billion in extra healthcare costs. Between 2000 and 2007, CDI-related deaths increased 400%, partly due to a more toxic strain. Because CDI is not a reportable condition nationwide, there are few national or regional incidence data in the United States. Public reporting of CDI cases in long-term care facilities in Ohio indicated an incidence of 2-3 initial cases per 10,000 resident days and an incidence of 1-2 recurrent cases per 10,000 resident days.

**Purpose:** To improve the identification of *Clostridium difficile* infections (CDI) and the implementation of evidence-based best practices to decrease infection and transmission rates.

**Scope of Practice:** Nursing staff (RNs, LPNs, Aides, etc.), Infection Preventionist, Ancillary staff (Dietary, Physical Therapy, etc.), Environmental Services, and Physicians (including Physician Extenders)

**Related Policies/Guidelines:** (reference your internal policies here)

**Surveillance:** In order to standardize the identification of CDI, the Centers for Disease Control and Prevention's National Healthcare Safety Network's (NHSN) *Clostridium difficile* Laboratory-identified Event surveillance guidelines will be utilized. Identifying CDI through laboratory-based surveillance allows a much less labor intensive method to track *C. difficile*, without clinical evaluation of the resident. This provides proxy measures of *C. difficile* healthcare acquisition, exposure burden, and infection burden based solely on laboratory data and limited resident admission/transfer data.

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## Policy and Procedure:

### **I. Suspected *C. difficile* Infection:**

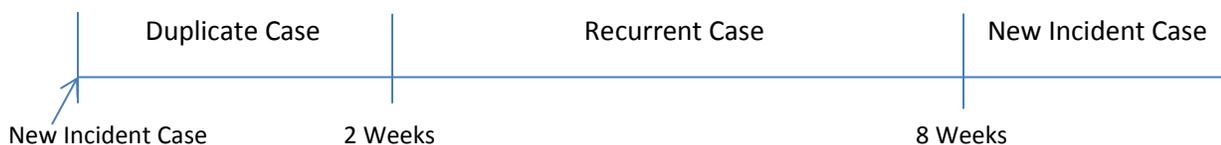
CDI should be suspected only if the resident has diarrhea (3 or more unformed stools within 24 hours). Only unformed stools (conforming to the shape of the specimen container) should be sent to the laboratory for testing. Formed stools should NOT be sent for laboratory tests. Do NOT use antimotility agents (lomotil) until a **NEGATIVE** test result is received.

### **II. Laboratory Testing:**

Once CDI is suspected, an order for laboratory testing of the stool must be obtained as soon as possible. Laboratory-based diagnostic tests for CDI include toxin enzyme immunoassay (EIA), cell cytotoxicity assay, glutamate dehydrogenase assay, and stool culture. If the culture or toxin assay is positive, determine if it is a new, duplicate, or recurrent CDI case. If the test result is negative, consider other infectious conditions, such as Norovirus or Salmonella or non-infectious conditions, such as non-toxigenic *C. difficile*.

### **III. NHSN Definitions:**

- A. *Clostridium difficile* Infections (CDIs)** are defined using NHSN's *Clostridium difficile* Infection Surveillance by Laboratory-identified (LabID) Event. NOTE: If a resident is transferred from an acute care facility and develops signs/symptoms of CDI within 3 days of admission to the long term care facility (LTCF), it is considered present at the time of transfer (not attributed to the LTCF) and reported back to the transferring facility. If a resident is transferred from an acute care facility and develops signs/symptoms of CDI on or after Day 4 of admission to the LTCF, it is attributed to the LTCF.
- B. A LabID Event** is a non-duplicate positive *C. difficile* test result (positive for toxin A and/or B or a toxin producing organism). A positive *C. difficile* test result is considered a duplicate (NOT a LabID event) if it is from the same resident following a previous *C. difficile* toxin-positive laboratory result within the past two weeks (14 days). A LabID Event is a recurrent case if it occurs more than 2 weeks but less than 8 weeks (>14 days-8 weeks) after the most recent LabID Event. A LabID Event is a new incident case if it occurs more than 8 weeks after the most recent LabID Event or if there is no documentation of any past LabID Event.



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### IV. Data Analysis:

- A. **CDI Numerator:** Number of non-duplicate CDI LabID Events identified in the month of surveillance. Only new LabID Events will be included in the CDI incidence rate.
- B. **CDI Denominator:** Resident days in the month of surveillance. Do not include resident beds being held open, only those beds in which a resident currently resides. Note: only include resident days on the units/wings numerator surveillance is being conducted.
- C. **CDI incidence rate** per 10,000 resident days is calculated by dividing the number of CDIs by the number of resident days and multiplying by 10,000.

$$\frac{\text{Number of CDIs in surveillance period}}{\text{Number of Resident Days in surveillance period}} \times 10,000$$

### V. Evidence-Based Practices to Prevent the Spread of C. difficile Spores

#### A. **Transmission-Based Precautions:**

Standard Precautions are based on the principle that all blood, body fluids, secretions, excretions (except sweat), non-intact skin, and mucous membranes may contain transmissible infectious agents. Standard Precautions apply to all residents, regardless of suspected or confirmed infection status, in any setting in which healthcare is delivered. Contact and enteric precautions are adopted *in addition to* Standard Precautions to prevent the spread of *C. difficile* spores.

When a resident develops diarrhea, Transmission-Based Precautions must be implemented immediately (Do NOT wait for test results). According to the CDC's 2007 Guidelines for preventing transmission of infectious agents in the healthcare settings, any patient/resident who develops diarrhea should be placed into contact precautions immediately.

1. **Hand Hygiene:** Hand hygiene is the most important strategy to prevent *C. difficile* transmission. Spores are transmitted to residents primarily by the hands of healthcare personnel who have touched a contaminated surface or item. *C. difficile* cannot be killed by alcohol-based hand rubs OR by traditional hand washing. Using soap and running water for at least 15 seconds MUST be performed to mechanically remove *C. difficile* spores from the skin. Alcohol-based hand rubs are NOT an appropriate substitute for handwashing. Wearing gloves can significantly reduce the spread of *C. difficile*, but gloves are NOT a replacement for hand washing. After washing, dry hands with a dry,

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disposable paper towel and turn off faucets with a clean paper towel. Strategies to optimize hand hygiene compliance include staff education, stickers on alcohol dispensers, or the removal of alcohol dispensers.

- a. Staff must perform hand hygiene:
    - i. Before contact with residents (alcohol hand rub or hand washing)
    - ii. After contact with residents (hand washing only)
    - iii. Before donning gloves and after doffing gloves
    - iv. Before handling medication, food, fluids, and medical equipment
    - v. After contact with any potentially soiled object or environmental surface, including personal protective equipment (PPE)
  - b. Residents must wash their hands (with help from healthcare staff, if necessary):
    - i. Before leaving their room
    - ii. Before self-feeding
    - iii. After toileting
    - iv. After contact with potentially soiled items (including personal belongings) and/or environmental surfaces
  - c. Visitors must wash their hands:
    - i. Before and after entering the resident's room
    - ii. Before and after contact with the resident
    - iii. After toileting
    - iv. After contact with potentially soiled items (including personal belongings) and/or environmental surfaces
2. Personal Protective Equipment (PPE): PPE must be donned before entering the room and discarded before exiting the room. While caring for a resident colonized or infected with *C. difficile*, PPE and personal items may become contaminated, so liberal use of PPE is appropriate. Refer to the Standard and Transmission-Based Precautions in the Long-Term Care Setting Policy on the appropriate ways to don and doff PPE.
- a. Gloves must be worn when providing resident care and when in contact with any potentially soiled items (clothing, bedding, environmental surfaces, etc.)
    - i. Don gloves before entering the room and remove/discard upon leaving the room.
    - ii. Wash hands (soap and water) after doffing gloves. If multiple residents share the same room, change gloves before contact with the other resident(s).
    - iii. Change gloves according to standard recommendations for glove utilization.

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- iv. Gloves are NOT a substitute for handwashing and alone do NOT guarantee prevention of transmission.
  - b. Gowns must be worn when providing resident care and when contact with excretions (changing linens, etc.) and soiled environmental surfaces will occur. Gowns should be fluid impervious, not made of cloth.
    - i. Don gowns before entering the room and discard before exiting the room (after doffing gloves).
    - ii. If multiple residents are in the same room, change gown before contact with the other resident(s).
    - iii. Wash hands (soap and water) after removing the gown.
- 3. Resident Placement: When possible, place residents with diarrhea:
  - a. In private rooms with a bathroom that is for their sole use
  - b. If private rooms are not available, place residents with active CDI together (cohort)
  - c. If cohorting is not possible, place the resident with active CDI with a resident who is at low risk for developing CDI and have separate toilets or bedside commodes
    - i. Provide at least 3 feet between the living spaces of each resident to reduce inadvertent sharing of items. To further emphasize separation between residents, a privacy curtain between the beds or tape on the floor may be used.
    - ii. Assign care of each resident to different nurses. If this is not possible, care for the uninfected resident first. If this is not possible, wash hands and change PPE between residents.
    - iii. When possible, the resident with CDI should use the toilet and the non-infected resident should use the commode.
    - iv. If the resident with CDI must use a commode, assign one to him/her for the duration of the infection. Disinfect the commode/toilet and surrounding area every time the commode is emptied.
    - v. Carefully transport the commode to the toilet designated for emptying (preferably located within the resident's room). Don clean gloves and a gown before leaving the resident's room with the commode. Disinfect the commode after it has been emptied (and the toilet and surrounding area disinfected with an EPA-approved sporicidal agent). Wash hands after disinfecting the commode and don clean gloves and a gown before returning the commode to the resident's room.
    - vi. Designate a specific shower to residents with CDI.

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- vii. If this is not possible, have residents with CDI shower after all other residents have showered
  - viii. Once the resident has showered, disinfect the shower with bleach.
4. Resident Activities: When a resident has symptomatic CDI (active diarrhea), transportation and movement outside the room should be limited to medically necessary purposes ONLY. The State Operations Manual Section 483.65(b) Preventing Spread of Infection states: **“When the Infection Control Program determines that a resident needs isolation to prevent the spread of infection, the facility must isolate the resident”** (the term isolation is also referred to as Transmission-Based Precautions).
- a. Residents must wash hands and wear clean clothes prior to movement from their room to limit shedding into the environment. If necessary, staff must assist them.
  - b. Staff must remove and discard contaminated PPE and perform hand hygiene prior to transporting residents on Transmission-Based Precautions.
  - c. Staff must don clean PPE to handle the resident at the transport destination.
  - d. The resident’s precaution status should be communicated to the receiving unit prior to transport, so that unit personnel are able to accommodate the special needs of that resident.
  - e. If the resident is being transferred outside the facility, the resident’s precaution status should be communicated to the receiving facility and the medi-van or emergency vehicle personnel.
  - f. To balance psychosocial needs with infection control needs in the LTC setting, activities the resident normally engages in should be provided within the resident’s room.
5. Resident Care Equipment, Instruments, Devices, and the Environment: Designate resident care items and equipment (i.e., stethoscopes, blood pressure cuffs, commodes, etc.) when possible. If this is not possible, clean and disinfect resident care equipment between residents. Use only disposable, single-use thermometers. Follow the manufacturer’s instructions for disinfection of medical equipment.
6. Laundry: Laundry must be handled in accordance with Standard Precautions for infectious materials. OSHA’s regulations for contaminated laundry can be found at: <http://www.osha.gov/SLTC/etools/hospital/housekeeping/housekeeping.html#ContaminatedLaundry>.
- a. When a resident is suspected of having active CDI, switch clothing and bedding to items that can be bleached.
  - b. Use moisture-resistant mattress covers and replace when soiled with blood and body fluids and at discharge/transfer.

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- c. Workers handling laundry MUST wear gloves and fluid impervious gowns.
  - d. Handle laundry as little as possible with minimal agitation.
  - e. Replace torn pillows and mattresses. Wash pillows and their protective covers when soiled.
  - f. Place wet contaminated laundry in a leak-proof, labeled container at the location where it was used.
  - g. Wash laundry from residents with active CDI separately from the laundry of other residents.
  - h. Wash laundry at the hottest available temperature. To kill *C. difficile* spores, water must reach a temperature of at least 160° F [71° C] for 25 minutes. It is recommended to use a sporicidal agent (bleach) in addition to the hot water washing. Facilities that do not have washing machines capable of reaching 160° MUST use a sporicidal agent (bleach) diluted to 125 parts per million (ppm) at the hottest available temperature.
7. **Internal Communication:** Notify relevant personnel and departments of residents with CDI. This includes the physician, nursing staff, environmental services, dietary, physical therapy, and group activity leaders. Educate staff about how to prevent cross-contamination between residents. This includes:
- a. When a resident with CDI shares a room with an uninfected resident, assign a different staff worker to each resident.
    - i. If this is not possible, staff should attend to the uninfected resident first.
    - ii. If this is not possible, staff must wash hands and change PPE between residents.
  - b. Infection Preventionist should monitor adherence to guidelines.
8. **Door Signage:** Communication of Transmission-Based Precautions on a resident door is necessary to alert healthcare professionals and other visitors that additional precautions must be taken. These signs must NOT disclose private health information, but should be general, such as: CONTACT PRECAUTIONS or STOP, SEE NURSE BEFORE ENTERING, etc.
- a. Signage will:
    - i. Be uniform throughout the facility
    - ii. Be printed (not handwritten)
    - iii. Remain in place until terminal disinfection of the room has occurred
  - b. All staff members in the facility will be in serviced on sign usage.
  - c. Family members often feel a certain amount of stigma attached to signage placed on their loved one's door. Education on procedures for Infection

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Prevention and Control activities will occur on admission and educational materials should be added to admission packets.

- d. Additionally, when residents are placed in Transmission-Based Precautions, families will be notified and organism-specific materials will be provided to enhance their understanding.
9. Resident and Family Education: To prevent the spread of CDI to other residents and to family members it is imperative to explain the purpose of instituting Transmission-Based Precautions. Hand hygiene education and enforcement among the resident, visitors, and family is important. Educational materials should be provided to help explain the resident's condition.
- a. The CDC has several educational materials about *C. difficile* for residents and visitors. These may be found at the following websites:
    - i. <http://www.cdc.gov/hai/organisms/cdiff/Cdiff-patient.html> <http://www.cdc.gov/VitalSigns/pdf/2012-03-vitalsigns.pdf>.
  - b. FAQs about *Clostridium difficile* may be found:
    - i. In color: [http://www.cdc.gov/HAI/pdfs/cdiff/Cdiff\\_tagged.pdf](http://www.cdc.gov/HAI/pdfs/cdiff/Cdiff_tagged.pdf)
    - ii. In black and white: [http://www.cdc.gov/hai/pdfs/cdiff/Cdiff\\_tagged-BW.pdf](http://www.cdc.gov/hai/pdfs/cdiff/Cdiff_tagged-BW.pdf)
    - iii. In large text: [http://www.cdc.gov/HAI/pdfs/cdiff/Cdif\\_largertext.pdf](http://www.cdc.gov/HAI/pdfs/cdiff/Cdif_largertext.pdf)
    - iv. In Spanish: [http://www.cdc.gov/HAI/pdfs/cdiff/SPAN\\_C-Diff.pdf](http://www.cdc.gov/HAI/pdfs/cdiff/SPAN_C-Diff.pdf)
10. Discontinuing Precautions: It is currently recommended to discontinue Transmission-Based Precautions 3 days after the resolution of diarrhea. Research indicates that environmental and resident skin contamination may be present even 10 days after resolution of diarrhea.
- a. Residents should shower to decrease skin contamination. If necessary, staff should assist them.
    - i. Because washing with soap and water does not kill *C. difficile* spores, the only way to decrease skin contamination is through mechanical removal of the spores from the skin. Bathing is NOT the same as showering as spores will remain in the surrounding water.
  - b. A specific shower should be designated to residents recovering from CDI.
    - i. If not possible, have residents recovering from CDI shower after all other residents have showered (but before residents with active CDI).
    - ii. Once the resident has showered, disinfect the shower with bleach.

### **VI. Environmental Disinfection:**

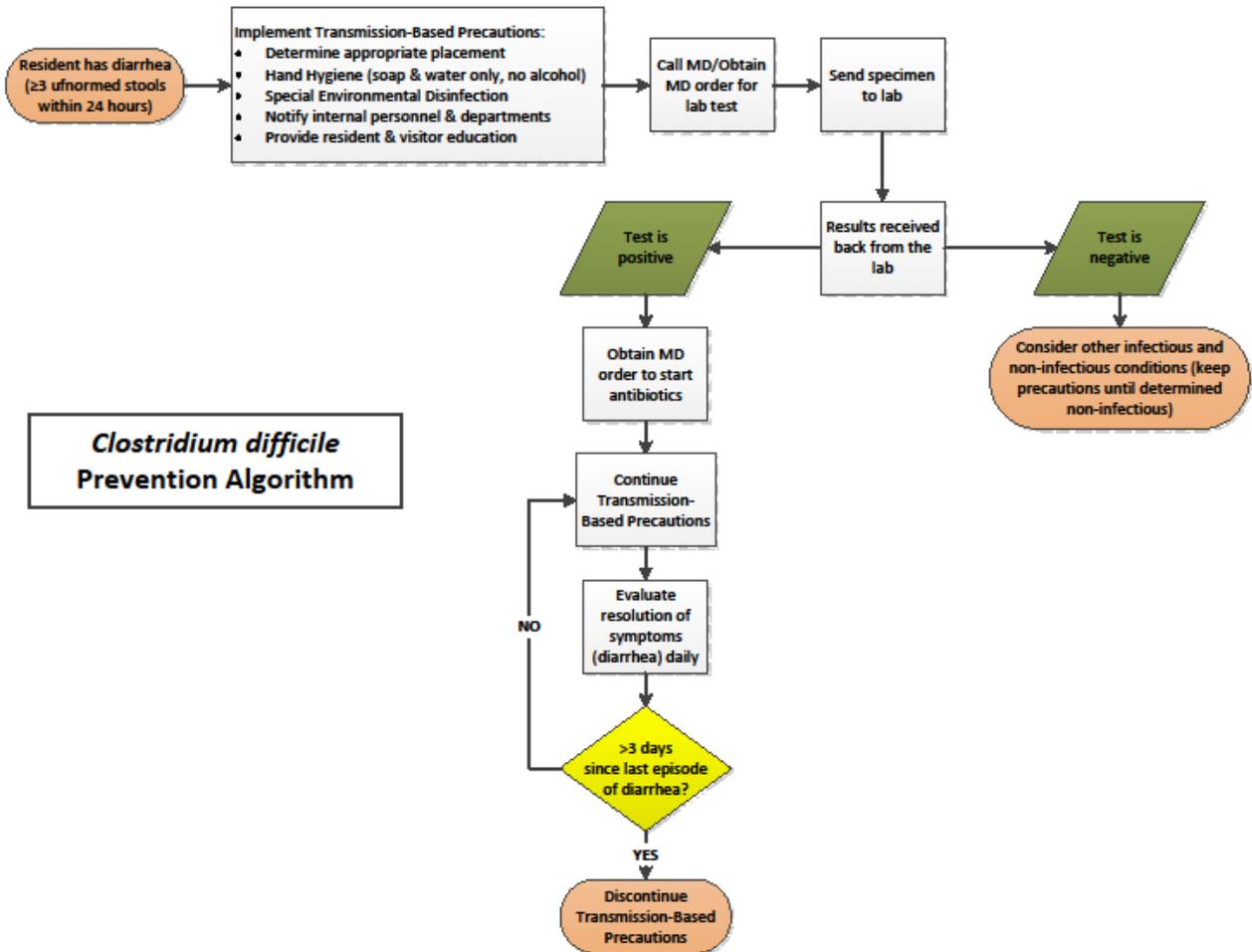
- A. *C. difficile* spores can exist for five months on hard surfaces. One study reported that in the hospital setting, spores were found in 49% of the rooms occupied by patients with CDI and in 29% of rooms occupied by asymptomatic carriers. Follow enhanced cleaning and disinfection procedures for *C. difficile*.
1. Keep surfaces clean and manage body substance spills promptly.
  2. Clean the rooms of residents with active CDI after cleaning all other rooms
  3. Gloves and gowns must be worn by environmental services when cleaning the room and discarded after the room is cleaned.
  4. Cleaning: Before disinfecting, surfaces and objects must be cleaned by mechanically removing visible soil with a detergent.
  5. Disinfection: To disinfect the rooms of residents with symptomatic CDI, use an EPA-approved sporicidal agent. Currently, sodium hypochlorite (household bleach) is the only EPA-approved disinfectant that is effective in killing *C. difficile* spores.
    - a. Either pre-mixed solutions or solutions of bleach mixed on site may be used.
    - b. If mixing on site, use only chlorine bleach without a scent additive (this reduces the parts per million (ppm) of available chlorine).
      - i. Follow manufacturer instructions regarding handling and use and take ALL precautions.
      - ii. Mix a 10% solution of bleach and water (1 part bleach, 9 parts water).
      - iii. Mix in a well-ventilated area, avoiding direct contact with skin and eyes. Bleach solutions may irritate the skin, eyes, and respiratory system and must be handled with care to protect staff and residents.
      - iv. Do NOT strengthen the concentration of the solution. It will NOT yield better disinfection results. Bleach is an extremely caustic agent and will damage surfaces over time if too concentrated.
      - v. Mix bleach solutions DAILY. Bleach degrades after 24 hours, so using a solution past its shelf life will NOT yield appropriate disinfection results.
      - vi. Do NOT mix bleach with ammonia based products. This creates toxic vapors.
      - vii. The contact time for bleach is 10 minutes (the surface must remain wet for 10 minutes).
    - c. Use a clean cloth saturated with a properly diluted disinfecting solution and work from clean to dirty (e.g., bedside tables, bedrails to bathroom) and from high surfaces to low surfaces.
    - d. Use disposable mop heads and wipes whenever possible.

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- e. Change cleaning solution, cloths, mop, and bucket after cleaning the room. Either discard cleaning items or launder/disinfect when finished.
- f. Personal Resident Furniture.
  - i. Personal resident furniture can be reservoirs for *C. difficile* spores. Cleaning and disinfecting activities ideally should include these items. Families and residents, however, may oppose the application of disinfectants to their personal belongings. Upon resident admission, caution residents and family that all furniture brought into the LTCF could require disinfection, which could result in damage to the item. Ask the resident and family for permission to disinfect the items in the event that it is necessary to do so. If they refuse permission, suggest they refrain from bringing personal furniture, especially furniture of high value.
- g. Daily Disinfection. Clean and disinfect environmental surfaces and reusable devices daily (or more frequently if visibly soiled). Pay particular attention to items likely to be contaminated with feces and high-touch surfaces.
  - i. High Touch: Bedrails, handrails, bed sheets, call buttons, resident chair, wheel chair, lifts, bed sheets, bed-side table, portable commodes, sink and faucets, toilet, tub/shower, telephones, TV controls, light switches, door knobs, windowsills, floors, etc.
  - ii. Medical Equipment: Thermometers, blood pressure cuffs, tube feedings, IVs, scales, etc.
  - iii. Horizontal surfaces: Counters, tables, window ledges, furniture surfaces (ideally including personal resident furniture), shelves, etc.
- h. Terminal Disinfection. Between resident discharges/transfers all equipment, furniture, cabinets, and shelves must be terminally cleaned and disinfected (including bedside curtains). Any items that cannot be disinfected must be discarded.
  - i. High Touch: Bedrails, handrails, bed sheets, call buttons, resident chair, wheel chair, lifts, bed sheets, bed-side table, portable commodes, bathroom sink, toilet, tub/shower, faucets, telephones, TV controls, light switches, door knobs, windowsills, floors, etc.
  - ii. Medical Equipment: Thermometers, blood pressure cuffs, tube feedings, IVs, scales, etc.
  - iii. Horizontal surfaces: Counters, tables, window ledges, furniture surfaces (ideally including personal resident furniture), shelves, etc.
  - iv. Other: Closet (inside and out), bedframe, mattress, curtains, lights, walls, etc.

**Decision Tree for Provider Use:**



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