Environmental Hygiene, Disinfection, and Sterilization

Infection Prevention Essentials in Long-Term Care
Spring 2019
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Key topics

- Daily room cleaning
- Discharge/turnover room cleaning
- Equipment cleaning
- Product selection
- Pest control

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**Environment of Care**

Environmental surveillance is an important element of an IP program to ensure a safe and sanitary environment is maintained.

- Thorough cleaning of the environment is imperative to prevent it from becoming a reservoir for organisms
- Facilities are required to have written policies and procedures which meet regulatory requirements and published standards
- EVS staff must be educated on proper use of PPE and when it must be worn
- EVS staff must be knowledgeable about proper handling and disposal of biohazardous and non-hazardous waste
- EVS staff must be knowledgeable about pest control
Environment of care specifics

Things to think about:

- Horizontal surfaces
- Carpeted surfaces: not recommended in areas where potential heavy soiling or spillage may occur
- Other surfaces; door knobs, bath rails, sink handles, upholstered surfaces
- Cleaning schedules
- Isolation room cleaning (clean last if possible)
- Terminal room cleaning (clean everything, discard what cannot be cleaned)
- Shared equipment (manufacturers instructions)
Definitions

- **Cleaning:**
  - The *physical removal* of dirt, body fluid, or other organic matter
  - Accomplished by use of detergent, water, and *friction*
  - Reduces the number of potential pathogens (unlikely to cause harm)

- **Disinfection**
  - Requires use of *EPA registered, hospital-approved product*
  - Destroys the number of potential pathogens on a surface

*Incomplete cleaning and disinfection procedures, combined with the persistence of pathogens in the environment, increase the likelihood that healthcare personnel (HCP) hands will unknowingly become contaminated.*

Environment of care policy elements

- Use of hospital-approved EPA-registered products, use, and storage
- Procedure and schedule for routine cleaning
- EVS staff safety; proper PPE, safety data sheets (SDS)
- Terminal room cleaning procedure
- Isolation room cleaning procedure (proper EPA-registered product, i.e. C. diff)
- Use of wipes, mops, and other cleaning supplies (microfiber technology)


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“The most common industry practice is to ensure that the surface is kept visibly wet for the full contact time indicated on the product label. The contact time, also known as the wet time, is the time that the disinfectant needs to stay wet on a surface in order to ensure efficacy. It is determined by the manufacturer and based on the results of microbiological testing using EPA-approved methods. Contact times for disinfectants range from 15 seconds to ten minutes, the maximum time allowed by the EPA.”
Environmental evaluation

The Centers for Disease Control and Prevention states that:

- Objective monitoring of the cleaning process beyond those outlined in the checklist is not well defined
- There is no standard method for measuring actual cleanliness of surfaces
- There is no standard method for defining the level of microbial contamination (bioburden) that correlates with good or poor environmental hygiene practices

- Collaboration between IP and environmental services (ES)
- Standardize your facility monitoring process
- Monitor at regular intervals - track progress
- Validate competency of those performing the monitoring
- Report data to your Infection Control Committee

https://www.cdc.gov/infectioncontrol/tools/index.html

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LTC common high touch surfaces

- Side rails
- Overbed table
- Nightstand
- Call light
- Remote control devices
- Telephone
- Light switches
- Doorknobs, handrails, other types of handles
- Grips, armrests, wheelchair handles, walkers, other mobility devices

This list is not all inclusive


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CDC environmental audit tools

- Direct practice observation: covert, real-time
- Swab cultures: expensive, time-consuming
- Fluorescent markers:
- ATP Bioluminescence: detects residual bioburden (ATP)

https://www.cdc.gov/infectioncontrol/tools/index.html

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### Monitoring EVS Practices

#### Environmental Services Checklist for Daily Cleaning of Resident Room

- **Task:**
  - Disinfect high-touch surfaces.
  - Clean and disinfect high-touch surfaces near resident.
  - Clean and disinfect high-touch surfaces in bathroom.

<table>
<thead>
<tr>
<th>Cleaning Task</th>
<th>Cleaned</th>
<th>Not cleaned</th>
<th>Not present in room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disinfect high-touch surfaces</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Clean and disinfect high-touch surfaces</td>
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<td></td>
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</tr>
<tr>
<td>Clean and disinfect high-touch surfaces in bathroom</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>


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**Schweon, SJ, et al Infection Preventionist’s Guide to Long-Term Care APIC (2013)**

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### More auditing tools

#### Infection Prevention and Control Manual
**Environmental Services/Housekeeping/Laundry**

<table>
<thead>
<tr>
<th>OBSERVATIONS</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Surfaces such as tabletops, bedpans, stools, and washbasins in the room are cleaned daily.</td>
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<tr>
<td>2. Garment is without tears.</td>
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<tr>
<td>3. Resin and handles, sink handles are cleaned daily.</td>
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<tr>
<td>4. Plumbing outlet is covered with a cap.</td>
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<tr>
<td>5. No lamps or lights are used to store or transport soil after cleaning.</td>
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<tr>
<td>6. Lamps or lamps are not used after cleaning.</td>
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<tr>
<td>7. Cleaning is occurring in areas where soil is stored.</td>
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<tr>
<td>8. Curves or bends are used when floor is swept.</td>
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</tr>
<tr>
<td>9. Toilets are equipped with toilet paper.</td>
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<td></td>
</tr>
<tr>
<td>10. Toilets are equipped with toilet paper at the end of the toilet.</td>
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</tr>
</tbody>
</table>

#### ISOLATION PROTOCOL

1. Isolates are cleaned and disinfected.
2. Equipment and water are cleaned before entering in an other room.
3. Windows, doors, and air vents must be kept clean.

#### Contact Precautions

1. Forehead, eyes, nose, and mouth are covered.

#### Droplet Precautions

1. Personal protective and surgical mask.

#### Airborne Precautions

1. Personal protective and surgical mask.

#### TERMINAL CLEANING

1. The unit is sprinkled.
2. The patient case is disinfected with a disinfectant solution.
3. Bed frame is disinfected with a disinfectant solution.
4. Bed frame is disinfected with a disinfectant solution.
5. Linens, towels, and weeds are disinfected with a disinfectant solution.

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**Terminal Cleaning of a Room**

Terminal cleaning of the room should be done when a resident who has been under source isolation is discharged.

1. Environmental services should wear appropriate personal protective equipment.
2. Discard all disposable items or equipment as appropriate.
3. Remove any masks or gowns from the designated area for cleaning and disinfection.
4. Gently apply all things in the appropriate laundry bags. Bags must be secured before leaving the area.
5. Dust the high ladders, window frames, and chair rails.
6. Wet clean all ladders, furniture, and furnishings. Including beds and door handles.
7. Wet clean all furniture including bedside stand, gowns, and bedsides and tables.
8. Vacuum clean furniture, furnishings, and tiles. Only use a suitable vacuum cleaner with a high filter mechanism.
9. The bed mattress should be replaced with a new mattress. If the mattress has been disinfected if body fluids have penetrated into the mattress fabric.
10. Wash the skin, floor, and spine with the appropriate disinfectant.
11. Open windows frequently to facilitate a thorough drying of all surfaces.
Testing options

- **ATP-luminescence** (adenosine triphosphate)
  - Expensive
  - Quick results
  - Requires equipment training
  - Detects ATP (present in living organisms)

- **Fluorescent marking**
  - Inexpensive
  - Quick results
  - Easy to use
  - Confirms “elbow grease”
Fluorescent marker surveillance

High touch horizontal environmental surface marked with fluorescent marker - before cleaning
Fluorescent marker surveillance

High touch horizontal environmental surface marked with fluorescent marker - after cleaning
Survival Time on Surfaces

- **Acinetobacter**: 3 days – 5 months
- **C. difficile**: 5 months
- **E. coli**: 1.5 hrs – 16 months
- **Enterococcus sp.**: 5 days - 4 months
- **Pseudomonas**: 6 hrs – 16 months
- **S. aureus**: 7 days – 7 months
- **HIV**: > 7 days
- **HBV**: > 1 week
- **Influenza**: 1- 2 days

Unique risk for LTC residents

Hidden dangers: Protocols and best practices are needed to stave off bathing-acquired infections

At the risk of sounding alarmist, your facility’s bath tubs and accessories such as lifts are likely going to make your residents sick – some experts say very sick.

Unless, of course, you’re taking the right precautions.

The biggest problem is, well, people. Not to be delicate, but bath and shower water are a veritable concoction of harmful bacteria and germs like E. coli and Methicillin-resistant Staphylococcus aureus (MRSA), which find their way onto fixture surfaces and pipes through residents’ orifices, mucous membranes and open wounds such as pressure sores.

Left behind, those infectious bacteria, viruses, yeasts, molds and other pathogens are disasters in waiting, as at least one major vendor notes on its website. Residents can readily self-infect during showering or bathing when water puts the bacteria on their bodies in motion. They can enter through bodily openings and also via inhaled water vapor.

✓ Article from May 8, 2018 McKnight’s Long-term Care News

✓ Identifies bathrooms in LTC facilities as potential infection risk

✓ Your facility Policy and Procedure should specify responsibility for cleaning and disinfection and provide a means to monitor direct care personnel to ensure proper cleaning procedures are followed for tubs, showers, faucets, shower heads, lifts, etc


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Equipment cleaning

Education on best practices, policies, and procedure is key

- Identify what items need to be cleaned, sterilized, or disinfected and by whom
- Identify best product to be used on equipment (manufacturer’s instructions for use)
- Identify when items must be cleaned (after resident contact, daily, weekly, monthly)

Policies should list:

- Regulatory requirements
- Guidelines
- Manufacturer’s recommendations

Spaulding Classification System

The Spaulding Classification System: an approach developed to address appropriate cleaning of patient care equipment

- **Critical**: enters sterile body tissue or bloodstream
  - Needles
  - IV catheters
  - IUC
- **Semi-critical**: contact with mucous membrane
  - Dental and podiatry equipment
  - Electric razors
- **Non-critical**: contact with intact skin
  - BP cuffs
  - Stethoscopes
  - Walkers & other mobility assist devices (gait belt)
  - Scales & slings


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Pest Control

Subject: Terminal cleaning of a room that has Bed Bugs

Policy #: Implemented: 12/2007
Reference(s): Revisions:
Approval: Senior V.P. Operations Reviewed
Department: Environmental Services Page: 1

Purpose
To outline basic guidelines for terminal cleaning of rooms that has patients with Bed Bugs.

Policy
This policy will describe step by step actions that need to be taken when a room is identified with Bed Bugs.

Procedure
1. Upon realization a patient has Bed Bugs the Patient will be cared for using “Contact Precautions”.
2. All personal clothing must be bagged, laundered in hot water and machine dried, dry cleaned, or discarded for incineration.
3. Daily room cleaning – mops will be discarded after cleaning patient room
4. Upon patient discharge, the room is to be shut down and environmental services should be called. The Environmental services department will then call the hospital’s licensed pest control operator (PCO). Never remove any items from the bed bug infested room before inspection and treatment by a PCO. This will help prevent relocating bed bugs to other areas of the unit.
References


Thank you