

Cleaning and Low-Level Disinfection in Healthcare

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Key Points

- ❖ Selection of Disinfectants
- ❖ Development of a Training Program
- ❖ Quality Assurance
- ❖ Policy Development
- ❖ Linen Handling

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Disclaimer

- Every attempt has been made to provide an unbiased, balanced presentation.
- This topic however, lends itself to specific products to be discussed.
- Name brands have changed to reflect generic names when possible.

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Clean, Sanitize, or Disinfect?

Action	What does it do?	Does EPA regulate the product?
Cleaning	Cleaning removes dirt and organic matter from surfaces using soap or detergents.	EPA regulates cleaning products only if they sanitize or disinfect.
Sanitizing	Sanitizing kills bacteria on surfaces using chemicals. It is not intended to kill viruses.	Yes, EPA registers products that sanitize.
Disinfecting	Disinfecting kills viruses and bacteria on surfaces using chemicals.	Yes, EPA registers products that disinfect.

EPA What's the difference between products that disinfect, sanitize, and clean surfaces?
<https://www.epa.gov/coronavirus/whats-difference-between-products-disinfect-sanitize-and-clean-surfaces>

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Cleaning

Cleaning is the process of removing dirt and germs from surfaces or objects



- Cleaning is the necessary first step of any disinfection process.
- Cleaning removes organic matter, salts, and visible soils, all of which interfere with the inactivation of microorganisms.
- The physical action of scrubbing with detergents and surfactants and rinsing with water removes substantial numbers of microorganisms.
- In some environments, surfaces that cannot be easily cleaned adequately, should be protected with barriers.
- Sometimes cleaning is enough but sometimes disinfection is necessary.
 - Removal of all visible blood and inorganic and organic matter can be as critical as the germicidal activity of the disinfecting agent.

CDC - Project Firstline - Episode 16: Cleaning? Disinfection? What is the Difference?
<https://www.youtube.com/watch?v=dLuRI9OpjnY>

CDC – Dental Infection Prevention and Control - Best Practices for Environmental Infection Prevention and Control
<https://www.cdc.gov/dental-infection-control/hcp/dental-ipc-faqs/cleaning-disinfecting-environmental-surface.html>

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Disinfection – Different Step*

** Note: Disinfectant products should not be used as cleaners unless the label indicates the product is suitable for such use.*

Disinfection is a different step that is done along with or after cleaning that kills germs on surfaces or objects



- **Disinfection is a different step that kills germs, usually a separate step but not always.**
 - Disinfection shouldn't come before cleaning, they either happen at the same time in a single product or cleaning comes first in a two-step process of cleaning and disinfection.
 - **When you do disinfect, it is important that the surface is clean.**
 - If isn't clean, disinfection might not work as the product might not be able to get to the germs because they are covered in other things.
 - If there's dirt or spills or smears on the surface, you might spread that around while you are disinfecting because the disinfectant won't necessarily pick that up and clean.

CDC - Project Firstline - Episode 16: Cleaning? Disinfection? What is the Difference?
<https://www.youtube.com/watch?v=dLuRI9OpjnY>

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Cleaning & Disinfection Methods

Ready to Use Wipes, Squeeze Pour Bottles, & Sprays



- Ready to use wipes are disposable wipes saturated with an appropriate disinfectant or detergent-disinfectant product.
 - Ensure they are stored appropriately with the lid closed, so the wipes remain wet. Discard wipes if they are no longer saturated.



- Narrow-necked squeeze pour bottles store the appropriate disinfectant or detergent-disinfectant product that is then poured over the cleaning cloths.
 - Narrow-necked bottles are preferred over buckets to prevent the “double dipping” of cleaning cloths, which can contaminate solutions.



- Spray bottles are where the appropriate disinfectant or detergent-disinfectant product is sprayed onto the cleaning cloths or directly onto surfaces then wiped.
 - Squeeze bottles are preferred over spray bottles for applying cleaning or disinfectant solutions directly to cleaning cloths before application to a surface.

- All portable containers for environmental cleaning products (or solutions) should be clean, dry, appropriately-sized, labeled, and dated.

CDC - Best Practices for Environmental Cleaning in Healthcare Facilities: in Resource-Limited Settings
<https://www.cdc.gov/healthcare-associated-infections/media/pdfs/environmental-cleaning-rls-508.pdf>

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Cleaning & Disinfection Method

Bucket Immersion a.k.a. Open Bucket Method



Bucket Immersion a.k.a. Open Bucket Method

1. Bucket is pre-filled with disinfectant solution (mixed to manufacturer’s instructions for use), usually at a filling station.
2. Clean cleaning cloths are placed in the bucket.
3. The object or surface is cleaned with sufficient saturation that the disinfectant stays on the surface, wet for the prescribed contact time.

Key Strategies for Success

- ✓ Ensure the type of cloths are compatible with the disinfectant
- ✓ Wipes are only removed from the bucket, never double dipped
- ✓ Dirty rag bag is needed on the housekeeping cart
- ✓ Change rags as needed to ensure saturation



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<https://www.cdc.gov/healthcare-associated-infections/media/pdfs/environmental-cleaning-rls-508.pdf>

NE ICAP – Environmental Cleaning in Healthcare Part 1: Set up the Cleaning Cart
https://www.youtube.com/watch?v=_O4B0Nmfr40&list=PLUK2nSFZhl9k-a1mc_ksZeTvDUa5he9Q&index=3

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Selecting products



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Considerations for the Selection of Disinfectants

- Speed of disinfection and speed of drying with normal use
 - Need adequate dwell time/ contact time
- Cleaning ability
- Disinfection ability and spectrum
- Personnel health and safety
- Surface compatibility / instructions for use for the surface
- Ease of use and application method (wipes, pour bottles, bucket immersion, and sprays)
- Stability
- Cost

Rutala, W., and Weber, D. Disinfectants used for environmental disinfection and new room decontamination technology. AJIC Vol 41, Issue 5, Supplement, S36-S41, May 01, 2013
<https://doi.org/10.1016/j.ajic.2012.11.006>

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Dispensing Stations vs. Ready to Use

Dispensing Stations

- Dilution can vary over time, so validation process important to measure effectiveness
- Cost effective, mixing as needed at point of use
- Chemical distributed in concentrate form, higher yield.
 - Potential splash risk, must use PPE (gloves, goggles)



Ready to Use

- Comes pre-mixed, dilution is always to manufacturer's instructions for use
- Costly on per-use scale
- Requires significant amount of storage



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Selection of Disinfectants

Quaternary
Ammonium
Compounds

Peracetic Acid

Improved
Hydrogen
Peroxide

Hypochlorite /
Chlorine

Alcohol

Phenolics

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Disinfectant Comparison

Disinfectant	Advantages	Disadvantages
Chlorine (a.k.a. bleach solutions)	EPA registered, broad-spectrum, low incidence of toxicity, reduces biofilms of surfaces, sporicidal at specific concentrations, fast acting, inexpensive	Discoloration of fabrics, inactivated by organic matter, toxic when mixed with ammonia, can be corrosive to metals in high concentrations, use with care
Quaternary ammonium compounds (a.k.a 'quats')	EPA registered, surface compatible, active against many bacteria, enveloped viruses, and fungi	Not sporicidal, not effective against non-enveloped viruses, water hardness & cotton can make it less microbicidal
Improved hydrogen peroxide	EPA registered, non staining, surface compatible, excellent coverage of organisms, benign for environment, often sporicidal	Expensive
Phenolics	EPA registered, active against many bacteria, enveloped viruses, and fungi, inexpensive	Not sporicidal, tissue irritant, can't be used around infants
Alcohol	Good organism coverage, easy to use, used to disinfect small surfaces such as rubber stoppers on medication vials, non-toxic residue	Not EPA registered, not sporicidal, no detergent or cleaning properties, can damage instruments, flammable, evaporates quickly

Rutala, W., and Weber, D. Disinfectants used for environmental disinfection and new room decontamination technology. AJIC Vol 41, Issue 5, Supplement, S36-S41, May 01, 2013 <https://doi.org/10.1016/j.ajic.2012.11.006>

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Program Development



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Policy and Program Development

- Operating Procedures
- Employee Development/Ongoing Training
- Quality Assurance/ Audit & Feedback

CDC - Best Practices for Environmental Cleaning in Healthcare Facilities: in Resource-Limited Settings
<https://www.cdc.gov/healthcare-associated-infections/media/pdfs/environmental-cleaning-rls-508.pdf>

CDC - Appendix B1 – Cleaning procedure summaries for general patient areas
<https://www.cdc.gov/healthcare-associated-infections/hcp/cleaning-global/appendix-b1.html>

Minnesota Hospital Association, Environmental Services Cleaning Guidebook
<https://www.mnhospitals.org/Portals/0/Documents/ptsafety/CDICleaning/4.%20Environmental%20Services%20Cleaning%20Guidebook.pdf>

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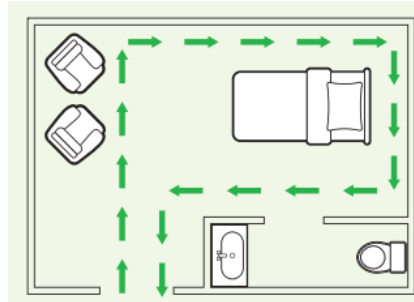
Policy Development Procedural Examples

- Disinfectant must be changed after (x) rooms
- After an isolation room, equipment must be wiped down
- Curtain change policy – after isolation/terminal cleaning, when visibly soiled & on an agreed upon frequency

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Essential Purposes of Policy

- Describe protocols
- Delineate training, education, and competency
- Align with regulatory requirements
- Define performance standards
 - Compliance
 - Quality assurance/ Performance Improvement



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Checklists and Job Aids

Considerations

- What items will the cleaner encounter?
- What are the key items to focus on?
 - These items are high risk items and drive performance evaluation
- Is not a stagnant list
 - Routine IP and HCW review
 - Delivery of care evolves and so do cleaning surfaces (e.g., Bar Code Med Admin)

Example

2) High touch areas

High touch areas
High touch surfaces are those that have frequent contact with hands. High touch surfaces in care areas require more frequent cleaning and disinfection than minimal contact surfaces. Cleaning and disinfection is usually done at least daily and more frequently if the risk of environmental contamination is higher (e.g., intensive care units).

Patient room high touch areas



Minnesota Hospital Association, Environmental Services Cleaning Guidebook
<https://www.mnhospitals.org/Portals/0/Documents/ptsafety/CDICleaning/4.%20Environmental%20Services%20Cleaning%20Guidebook.pdf>

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Training

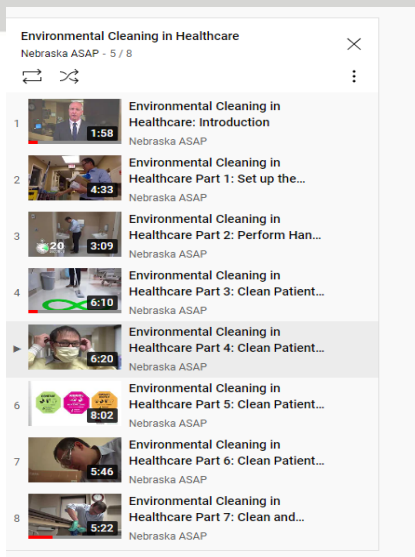
- On the job training
 - How much time can be afforded to ensure tasks and performance can be completed to standard?
 - It takes up to 3 months for frontline staff to fully understand the tasks that are expected of them
- Weekly/Monthly Training
 - Recognize and adapt to turnover
 - Touch on critical competencies over the course of the year, broken up monthly/ quarterly
 - Use as an opportunity to bring up seasonal topics
 - High touch surfaces during flu season

Bauer, Talya N. (2010). *Onboarding New Employees: Maximizing Success*, SHRM Foundation. 1 – 37.

Nebraska ICAP & ASAP Environmental Cleaning in Healthcare, 8 training videos. Access the playlist at https://www.youtube.com/playlist?list=PLUK2nSFZhL9k-a1mc_ksZeTvDUa5he9Q
<https://icap.nebraskamed.com/facilities/acute-care/acute-facility-resources/>

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Training Resource



- Nebraska ASAP and Nebraska ICAP are funded by the Nebraska DHHS HAI/AR program through a CDC grant.
- Training videos are free and do not endorse any specific product.
- They are translated into multiple languages.

Nebraska ICAP & ASAP Environmental Cleaning in Healthcare, 8 training videos. Access the playlist at https://www.youtube.com/playlist?list=PLUK2nSFZhL9k-a1mc_ksZeTvDUa5he9Q or search “Nebraska ASAP Environmental Cleaning in Healthcare – YouTube” or <https://icap.nebraskamed.com/facilities/acute-care/acute-facility-resources/>

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Quality Assurance



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Quality Assurance Tips

Prior to any quality observation or monitoring program, it is essential to engage the frontline

1. Provide an overview of the importance of HAls in a manner commensurate with their educational level using as many pictorial illustrations as is feasible.
2. Explain their role in improving patient safety through optimized hygienic practice.
3. Review specific terminal room cleaning practice expectations.
4. Discuss the manner in which their practice will be evaluated. A participatory demonstration of the monitoring method is very useful.
5. Provide them with information from the baseline evaluation emphasizing or possibly exclusively showing them results for those objects which have been most thoroughly cleaned.
6. Stress the non-punitive nature of the program.
7. Inform them that their good performance will be broadly recognized (i.e., beyond their department) and highlighted within their department for others to emulate.
8. Repeatedly reinforce the importance of their work, and how it directly relates
 - to the healthcare facility's goals and mission
 - how it is appreciated by patients/ residents and plays a major role in everyone's' satisfaction with the facility

CDC: Options for Evaluating Environmental Cleaning
<https://www.cdc.gov/infection-control/php/evaluating-environmental-cleaning/>

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Great Environmental Cleaning is Important Everywhere

Department	Surface examples	Team Members
Clinical care units	Scales, vital signs monitoring carts, radiology equipment, lifts, computers	CNAs, MAs, nursing team, radiology team
Cafeteria and dining	Dining tables, food service surfaces	Dietary team
Patient/ resident rooms	Bedrails, bedside table, doorknobs, hand washing faucets, phone, call light	Housekeeping or clinical team
Spas and bathing rooms	whirlpool seat, temperature control, handheld sprayer	Spa team or clinical team



CDC: Options for Evaluating Environmental Cleaning

<https://www.cdc.gov/infection-control/php/evaluating-environmental-cleaning/>

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Monitoring Options

- **Direct Practice Observation**
- **Swab Cultures**
- **Agar Slide Cultures**
- **Fluorescent Markers**
- **ATP Bioluminescence**

CDC: Options for Evaluating Environmental Cleaning

<https://www.cdc.gov/infection-control/php/evaluating-environmental-cleaning/>

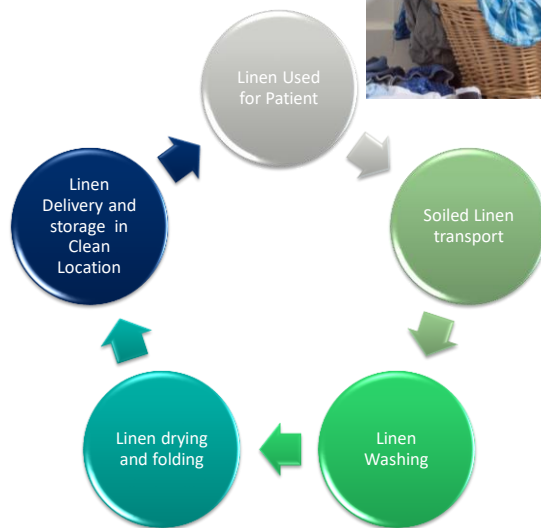
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Linen Handling



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Linen Handling



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Transport of Laundry



The facility practices must include how staff will handle and transport the laundry with appropriate measures to prevent cross-contamination. This includes, but is not limited to, the following:

- Contaminated linen and laundry bags are not held close to the body when transporting;
- No special precautions (e.g., double bagging, melting bags) or categorizing (e.g. biohazard, color-coded) for linen originating in transmission-based precaution rooms is necessary
- Double bagging of linen is only recommended if the outside of the bag is visibly contaminated or is observed to be wet through to the outside of the bag
- Contaminated linen carts must be cleaned and disinfected whenever visibly soiled and according to a schedule developed by the facility;
- Separate carts must be used for transporting clean and contaminated linen. If this is not possible, the contaminated linen cart should be thoroughly cleaned and disinfected per facility protocol before being used to move clean linens;
- Clean linens must be transported by methods that ensure cleanliness and protect from dust and soil during intra or inter-facility loading, transport, and unloading

State Operations Manual Appendix PP - Guidance to Surveyors for Long Term Care Facilities – Rev. 225; Issued: 8-8-24, §483.80(e) <https://www.cms.gov/medicare/provider-enrollment-and-certification/guidanceforlawsandregulations/downloads/appendix-pp-state-operations-manual.pdf>

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Laundry Processing

Washing/drying processes includes the use of manufacturer’s instructions for use (IFU) for laundry additives and equipment maintenance.

- The facility staff must prevent contamination of laundry in processing areas
- Availability and use of hand hygiene products, as well as appropriate PPE (i.e., gloves and gowns) while sorting and handling contaminated linens;
- The receiving area for contaminated textiles is clearly separated from clean laundry areas. Workflow should prevent cross-contamination;
- Laundry equipment (e.g., washing machines, dryers) is used and maintained according to the manufacturer’s IFU to prevent microbial contamination of the system;
- Laundry detergents, rinse aids or other additives are used according to the manufacturer’s IFU.

State Operations Manual Appendix PP - Guidance to Surveyors for Long Term Care Facilities – Rev. 225; Issued: 8-8-24, §483.80(e) <https://www.cms.gov/medicare/provider-enrollment-and-certification/guidanceforlawsandregulations/downloads/appendix-pp-state-operations-manual.pdf>

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Linen Storage



Facility practices must address linen storage, and should include but are not limited to:

- Covers are not needed on contaminated textile hampers in resident care areas (unless state licensing rules require them)
- Clean linen must always be kept separate from contaminated linen.
 - The use of separate rooms, closets, or other designated spaces with a closing door provides the most secure methods for reducing the risk of accidental contamination.

CDC - Guidelines for Environmental Infection Control in Health-Care Facilities (2003) - Background G. Laundry and Bedding <https://www.cdc.gov/infection-control/hcp/environmental-control/laundry-bedding.html>

CMS Memo S&C 13-09-NH <https://www.cms.gov/medicare/provider-enrollment-and-certification/surveycertificationgeninfo/downloads/survey-and-cert-letter-13-09.pdf>

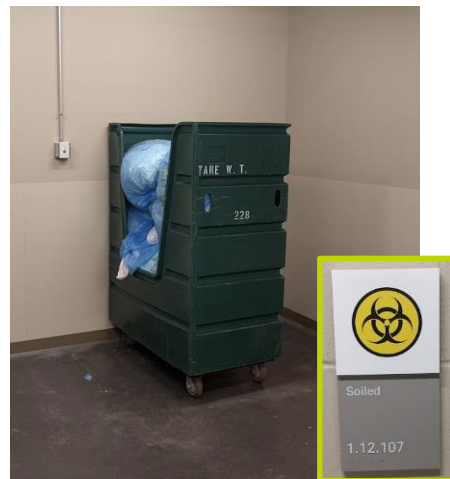
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Linen: Separation of Clean & Dirty

Clean Linen Staging Area



Storage of Contaminated/ Dirty Linen



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Questions?



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