

Disinfectant Agent Selection & Best Practices

Philadelphia Department of Public Health
Healthcare-Associated Infections and
Antimicrobial Resistance (HAI/AR) Program

Disclosure & Acknowledgement

I have no actual or potential conflict of interest in relation to this program or presentation.

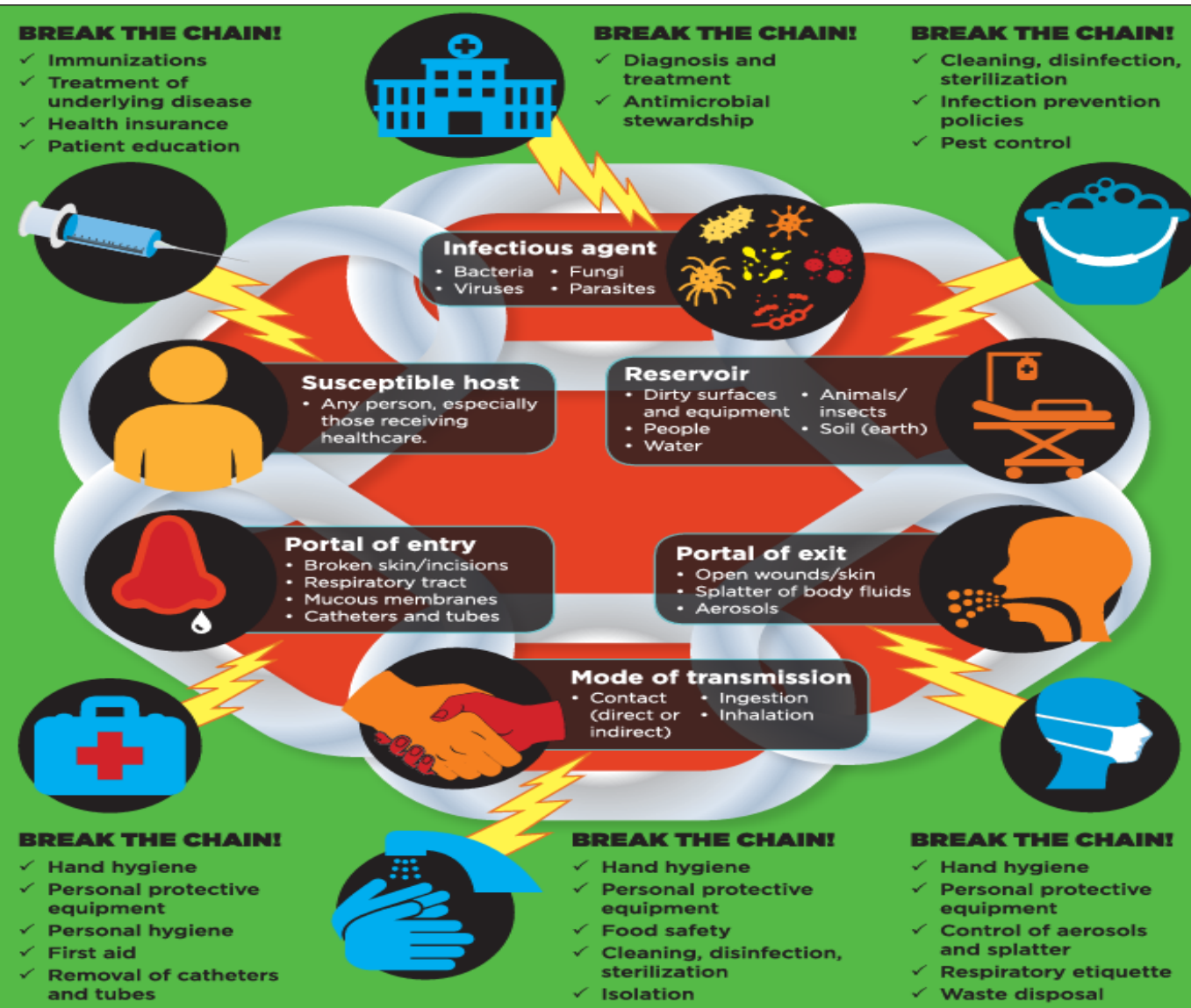
This presentation was developed by the Association for Infection Prevention and Control (APIC) Consulting Services with the aid of Debra A Runyan, BS, MT(ASCP), CIC.

Objectives

The learner will be able to:

1. Explain the difference between cleaning and disinfection.
2. Apply agent selection criteria.
3. Understand how to handle chemical agents safely.
4. Understand the importance of agent labels.

The Chain of Infection



Break the Chain

- Reduces the number of microorganisms
- Interrupts mode of transmission

Cleaning

- Physically remove foreign and organic matter

Disinfection

- Thermal or chemical process for inactivating microorganisms on inanimate objects

Type of agent

- Environmental Protection Agency (EPA) registered
- One-step
- Two-step

Cleaning and Disinfection Key Points: What's on Your Surfaces?

If you could examine the people, surfaces, and devices around you under a microscope, what would you see?



Clostridioides difficile (spores)
5 months



Escherichia coli
1.5 hours to 16 months



Enterococcus spp.
5 days to 4 months



Hepatitis B virus
> 1 week



Norovirus
8 hours to 7 days



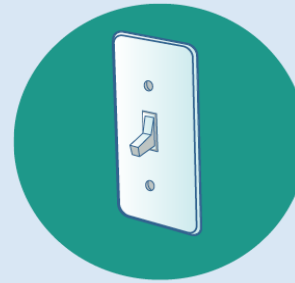
Staphylococcus aureus
7 days to 7 months

Cleaning and Disinfection Key Points: High-Touch Surfaces

**Nearly 50% of high touch surfaces
were not adequately cleaned**



DOOR HANDLE



LIGHT SWITCH



BEDPAN CLEANERS



TOILET HANDHOLDS

Cleaning and Disinfection Key Points: EPA Numbers for Disinfectants

EPA number for verification of:

- Active ingredient or type of disinfectant
- Product name and company
- Which directions to follow
- Contact time in minutes
- Type of formula
- Approved surface type
- Use sites

Agent Selection Considerations

- EPA registered as a hospital disinfectant
- Ready to use or dilution requirement
- Pathogen effectiveness
- Contact time
- Surface compatibility
- Personal protective equipment per Safety Data Sheet
- Agent pros and cons
- Avoid cotton cleaning cloths

Agent Selection: Pathogen Kill Claims

Hard to kill pathogens

Spore formation

- *C. difficile* – EPA List K

Non-enveloped virus

- Norovirus – EPA List G

Yeast

- *C. auris* – EPA List P

Tuberculosis

- *M. tuberculosis* – EPA List B



Proper Use of Agents

Follow the instructions for use included in the product labeling. This is important to ensure the pathogens specified on the label will be killed.

Here are a few instructions you should make sure not to overlook:



Is the disinfectant in a ready-to-use format?

Is a cleaning step required prior to application?

What is the contact time?

Is the disinfectant compatible with the surface upon which it will be used?

Agent Labels

What's On Your Label?

- Active ingredients
- EPA registration number
- Instructions for use
- Contact time
- Signal words (caution, danger, warning)
- Precautionary statements
- First aid
- Storage & disposal

How to Read a Disinfectant Label

Read the entire label.

The label is the law!

Note: Below is an **example** of information that can be found on a disinfectant label

Active Ingredients:
What are the main disinfecting chemicals?

ACTIVE INGREDIENTS:
Alkyl (80% C14, 30% C16, 5% C12, 5% C18) 10.0%
Dimethyl Benzyl Ammonium Chloride 90.0%
OTHER INGREDIENTS: 100.0%
TOTAL: 100.0%

EPA Registration Number:
U.S. laws require that all disinfectants be registered with EPA.

EPA REG NO. 55555-95-55555

Directions for Use (Instructions for Use):
Where should the disinfectant be used?

Directions for Use

INSTRUCTIONS FOR USE:
It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

What germs does the disinfectant kill?

For Disinfection of Healthcare Organisms:
Staphylococcus aureus,
Pseudomonas aeruginosa.

What types of surfaces can the disinfectant be used on?

To Disinfect Hard, Nonporous Surfaces:
Pre-wash surfaces.
Mop or wipe with disinfectant solution.
Allow solution to stay wet on surface for at least 10 minutes.
Rinse well and air dry.

How do I properly use the disinfectant?

Contact Time:
How long does the surface have to stay wet with the disinfectant to kill germs?

CAUTION

Signal Words (Caution, Warning, Danger):
How risky is this disinfectant if it is swallowed, inhaled, or absorbed through the skin?

PRECAUTIONARY STATEMENTS:

Hazardous to humans and domestic animals. Wear gloves and eye protection.

Precautionary Statements:
How do I use this disinfectant safely? Do I need PPE?

CAUSES MODERATE EYE IRRITATION. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Avoid contact with foods.

First Aid:
What should I do if I get the disinfectant in my eyes or mouth, on my skin, or if I breathe it in?

FIRST AID: IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes.

POISON CONTROL: Call a Poison Control Center (1-866-366-5048) or doctor for treatment advice.

STORAGE AND DISPOSAL: Store this product in a cool, dry area away from direct sunlight and heat. When not in use keep center cap of lid closed to prevent moisture loss. Nonrefillable container. Do not reuse or refill this container.

Storage & Disposal:
How should the disinfectant be stored? How should I dispose of expired disinfectant? What should I do with the container?

Agent Preparation

- Mixing Ratio
 - Dipstick validation
 - Mixing station documentation of calibration and maintenance
 - Validate mixing station labeling
 - Only current product available to staff
 - Mixing equipment readily available and performed correctly
- Policy, procedures, and protocols
- New hire and annual education and competency

Agent Best Practices

- Clean, disinfect, and air-dry containers
- Do not top off products
- Label consistent with the OSHA Communication Act
- Product expiration date clearly identified
- Prohibit mixing chemicals
- Consistent manufacturer
- Resources including agent, surface, and contact time

Agent Safety

- Personal Protective Equipment (PPE) consistent with the Safety Data Sheet (SDS)
 - Type of gloves
 - Eye protection
 - Protective clothing
 - Respirator
- PPE at mixing stations or locations
- PPE audit(s)
- SDS information readily available



PDPH Chemical Agent List Template



Facility Name:

Chemical Agent List

Date of Last Review:

Full Product Name	Type of Agent (cleaner, disinfectant)	EPA Number (first two sets)	Appropriate Surface(s)	Pathogens Killed	Contact Time in Minutes	PPE Needed

PDPH Agent Audit Form



Agent Audit Form

Date:

Location(s):

Expected Element	As Expected	Improvement Needed	Comments
Only approved agents are used.			
The agent is used on the correct surface.			
The agent contact time is followed.			
The correct agent is utilized for gastrointestinal illness (e.g., C. difficile, Norovirus).			
The correct agent is utilized to clean up blood spill(s).			
PPE is worn as expected for agent application.			

References

Best Practices for Environmental Cleaning in Healthcare Facilities: in Resource-Limited Settings Version 2

<https://www.cdc.gov/hai/pdfs/resource-limited/environmental-cleaning-RLS-H.pdf>

Nursing Home Infection Preventionist Training Course - CDC TRAIN - an affiliate of the TRAIN Learning Network powered by the Public Health Foundation

https://www.train.org/cdctrain/training_plan/3814

EVS and the Battle Against Infection: a Graphic Novel

<https://www.cdc.gov/infectioncontrol/training/evs-battle-infection.html>

Project Firstline Explainer Videos

<https://www.ahe.org/project-firstline/explainer-videos>

Selected EPA-Registered Disinfectants | US EPA

<https://www.epa.gov/pesticide-registration/selected-epa-registered-disinfectants>

How to Read a Disinfectant Label

[https://www.epa.gov/system/files/images/2022-09/HowToReadALabel-508c-Final-2022-08-30%20\(005\)_1.png](https://www.epa.gov/system/files/images/2022-09/HowToReadALabel-508c-Final-2022-08-30%20(005)_1.png)

Six Steps for Safe & Effective Disinfectant Use

<https://www.epa.gov/sites/default/files/2020-04/documents/disinfectants-onepager.pdf>

Self-disinfecting surfaces: Review of current methodologies and future prospects

[https://www.ajicjournal.org/article/S0196-6553\(13\)00011-4/fulltext](https://www.ajicjournal.org/article/S0196-6553(13)00011-4/fulltext)

For Questions, Please Contact:

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THANK YOU

