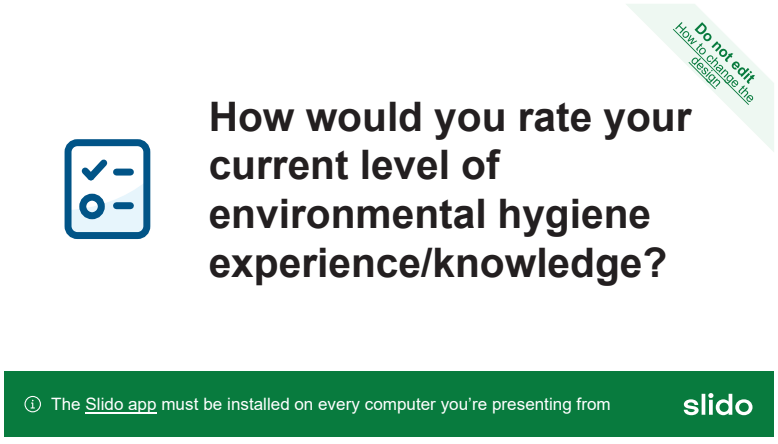

CLEAN,
SANITIZE OR
DISINFECT?
Environmental Hygiene
Quiz Show for Frontline
Healthcare Providers!
Rebecca Battjes, MPH, CIC, FAPIC


Rebecca is a board-certified infection preventionist & a fellow of APIC. After more than 23 years in healthcare, she left to work with Diversey–a global leader in cleaning & disinfection.
In the past 3 years, she & her team have shadowed EVS technicians in hospitals across the US and Canada–identifying best practices and the biggest opportunities for improvement.


"It is time for cleaning, still the Cinderella of infection control, to step into the spotlight."
Dancer, S.J. Hospital cleaning: past, present, and future. Antimicrob Resist Infect Control 12, 80 (2023). https://doi.org/10.1186/s13756-023-01275-


SESSION OBJECTIVES
01.
DIFFERENCES
Describe the differences between cleaning, sanitizing & disinfecting.
02.
SURFACES
Apply concepts of cleaning, sanitizing & disinfection to common household &, most importantly, healthcare surfaces.
03.
PRODUCTS
Distinguish common EVS products, kill claims & review reading of disinfectant labels.


How would you rate your current level of environmental hygiene experience/knowledge?
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DEFINING HYGIENE
01.
Clean, sanitize or disinfect?
Why does it matter?

WHAT IS CLEANING?

The **physical removal** of foreign material (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms).

Cleaning **physically removes** germs, but **does <u>not</u>** actually **kill** them.

WHAT IMPACTS CLEANING?

- **Soil**
- **Residue**
- **Temperature**
- **Water pH** (pH)
- **Water Hardness**
- **Application**

WHAT IS SANITIZING?

Sanitizing **kills *some* bacteria** on surfaces using EPA-approved chemicals.

The amount of bacteria killed (called "log reduction") depends on whether or not the surface comes into contact with **food**.

DEFINITION OF A "FOOD CONTACT SURFACE"

Per USDA, food contact surface is any surface that may come in direct contact with exposed meat or poultry product.

Examples include: conveyor belts, table countertops, knives, stock pots & cutting boards. Equipment should be **sanitized every 4 hours** if used consistently.

POTABLE WATER RINSING?

Some **food contact** surface products require rinsing with potable (drinkable) water, others do not.

Always look at the label to learn if rinsing is required!

WILL SANITIZERS IMPACT VIRUSES & FUNGI?

No. Products that only carry an EPA-registered sanitizing claim are not tested to inactivate viruses, like influenza or SARS CoV-2 or fungi, like *C. auris* or *C. albicans*.

To ensure eradication of viruses, a product must be registered as a disinfectant.

SOFT SURFACE SANITIZING

- "Soft surface" claims are limited, by the EPA, to "sanitizer."
  - Soft surface examples: privacy curtains, fabric upholstery
- EPA just published soft surface disinfectant testing methods, so we can expect to see more products with these claims in the near future.
- The sanitization standard for contamination reduction of non-food contact surfaces is generally accepted as 99.9% (a 3-log reduction).
- The sanitizer claim is based on laboratory testing of only two bacteria, not viruses or fungi.

Products may carry a claim to sanitize soft surfaces, like privacy curtains

SOFT SURFACE SANITIZING IS BETTER THAN NOTHING!

- Current professional guidelines do not fully address soft surfaces in healthcare!
- Do not let the lack of a full 6-log reduction claim dissuade you from using/advocating for these products!
- Recent study (Gibson 2022) in 6 NHs, 40% of residents' privacy curtains were contaminated with an MDRO
- Rutala et al (2014) recommend cleaning the grab area with a hydrogen peroxide RTU product, spraying 3 times from 6 - 8 inches away.
  - Reduced MDRO contamination by >90% (*despite* lack of EPA-specific claims!)
- Continuous decontamination technologies like Dry Hydrogen Peroxide (DHP) have also been shown to reduce bacterial load on soft surfaces (Sanguinet 2021).

AI prompt: Create an image of a hospital privacy curtain covered in germs

WHAT IS DISINFECTION?

Disinfection **eliminates** most microorganisms, or germs, including **viruses, bacteria & fungi** from surfaces.

Do all disinfectants require a precleaning step, even if the surface is NOT visibly soiled?

NO.

One-step cleaner disinfectants do NOT require pre-cleaning UNLESS visible soil is present . . .

UNLESS your policies state otherwise!

Is a tuberculocidal (i.e., intermediate level) disinfectants REQUIRED for visible blood & body fluid contamination?

NO!

BUT older guidelines AND the Spaulding Classification System complicate the issue.

Per CDC (2008) & other experts (Rutala, Weber & Boyce, 2023), "Some items that may come in contact with nonintact skin for a brief period of time (e.g., hydrotherapy tanks, ultrasound probes on intact skin [includes central line puncture site]) are usually considered noncritical surfaces and are disinfected with low or intermediate-level disinfectants." "

SPORICIDAL DISINFECTANTS

Some diseases, like *C. diff*, are caused by bacterial spores, which can outsmart & survive many disinfectants.

EPA List K Chemistries	Advantages	Disadvantages
Hydrogen Peroxide/Peracetic Acid	Compatibility, broad pathogen coverage	Unstable/shelf life, expensive, odor, may be negative health effects
Sodium Hypochlorite (bleach)	Affordable, broad pathogen coverage, familiar, available in multiple formats	Hazard reactions with acids & ammonias, corrosive, stains, odor, respiratory irritant, often requires rinse
Hypochlorous Acid	Affordable, broad pathogen coverage	Long contact times, may lack surfactants, onsite generation
Dichloro Isocyanurate (NaDCC)	Non-bleach sporicide, affordable, long shelf life, easy to store (compact)	Requires dilution, chlorine smell, may be negative health effects

PUTTING IT ALL TOGETHER:

LOG REDUCTION = GERM REDUCTION

Hard, nonporous surface					
1,000,000 Germs!	10,000 Germs Remain	1,000 Germs Remain	100 Germs Remain	10 Germs Remain	1 Germ Remains
End of Day	2 Log 99%	3 Log 99.9%	4 Log 99.99%	5 Log 99.999%	6 Log 99.9999%
	Cleaning	Non-Food Contact Sanitizing	Disinfection for viral pathogens	Food contact sanitizer	Low/ intermediate disinfection

WE MUST REMOVE VISIBLE DIRT BEFORE SANITIZING OR DISINFECTING!

WIPE 1	WIPE 2	WIPE 3	WIPE 4
First pass shows significant dirt removal	Less soil released at second wipe	Barely any soil on third wipe	Surface disinfected, 1-minute wet time

Let's have some fun!

We'll begin with common household surfaces & activities. We'll then advance to healthcare tasks.

02.

HYGIENE AT HOME VS IN HEALTHCARE

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Dishes in the sink at home?

CLEAN

- Standard dishwashing detergents (or soaps) are **not EPA-registered**.
- If we look at the label, there are no pathogen kill claims or EPA reg #.
- Instructions: Dispense into sink or directly onto sponge. Wash dishes & rinse thoroughly.
- Fun fact! Some in-home dishwashers do have sanitizing claims. To do so, the machine must be registered with EPA.

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Baby bottles?

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IT DEPENDS!

- Per the CDC, if your baby is **< 2 months** old, was born **prematurely**, or has a **weakened immune system** due to illness (such as HIV) or medical treatment (such as chemotherapy for cancer), **sanitizing** feeding items **daily** (or more often) is particularly important.
- Daily sanitizing of feeding items may not be necessary for older, healthy babies, if those items are cleaned carefully after each use.
- To learn how, go to https://www.cdc.gov/hygiene/childcare/clean-sanitize.html

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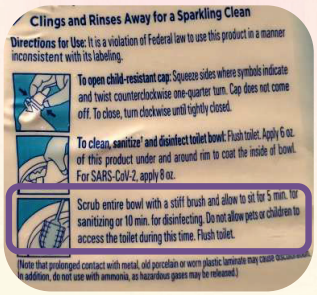
Household toilet?

IT DEPENDS!



How I apply the product determines whether I am cleaning, sanitizing or disinfecting!

- 6 oz versus 8 oz for COVID-19?!
- 10 **whole** minutes = disinfect
- 5 minutes = sanitize
- Anything rinsed/removed before 5 mins = cleaning

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Spraying a patient room countertop with a 3-minute disinfectant, and wiping immediately with a dry cloth or towel.

CLEAN

- The keyword = IMMEDIATELY
- Spraying a surface wet, and then immediately wiping it dry does not allow the full **contact time.**

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What is the highest level of hygiene needed for a dedicated meat cutting board in the kitchen?

SANITIZE!

In kitchens, the highest level of food-contact surfaces needed is **sanitizing**, which reduces germs by 5-logs if we adhere to the **contact time**.

Disinfection of high-touch surfaces (light switches, door knobs & handles, etc) is still needed in dietary areas.

Wiping patient bed rails, wetted once with a 10-minute disinfectant.

IT DEPENDS . . .

Keywords: **wetted once**

In order to disinfect, the disinfectant solution must remain **wet for the ENTIRE 10 minutes**!

It is challenging to keep surfaces wet for that long, and oftentimes, reapplying is needed.

If we don't meet the **contact time**, we may just be cleaning/removing–and not killing germs.

Wiping a doorknob, wetted with a 1-minute disinfectant wipe (no wiping drying afterward).

DISINFECT

Using a pre-wetted wipe with a 1-minute contact time is very likely to remain wet for 60 seconds without reapplication.

We can feel confident the disinfectant is killing germs.

Healthcare facility patient/resident bathroom toilet bowl?

IT DEPENDS!

What chemical is EVS using?

Many facilities use a cream cleanser with no biocidal claims.

Other facilities may use a restroom disinfectant with a long contact time (≥5 mins) and flush immediately after scrubbing.

To truly disinfect, the bowl interior must remain wet the entire contact time! Read the IFUs!

Mopping the floor in an occupied patient room during daily room cleaning?

IT DEPENDS!

What chemical is in your mop bucket?

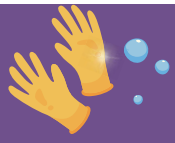
Most facilities clean patient room floors daily with a **neutral floor cleaner**.

Some facilities may choose to **disinfect floors** at certain times. **Operating rooms** will apply a disinfectant on the floor per AORN guidelines.

To truly disinfect, the floor must remain wet the entire contact time!

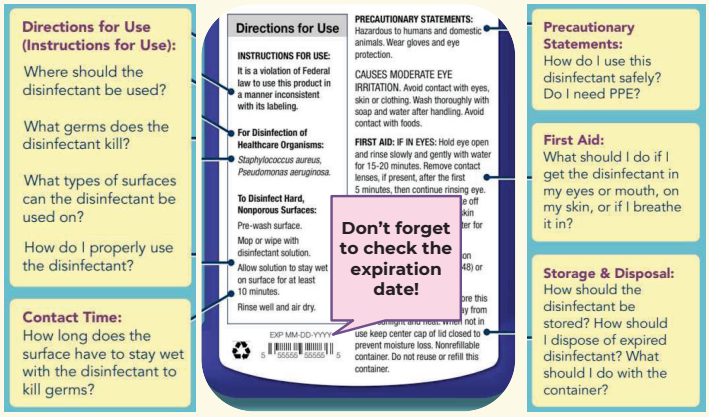
03. PRODUCT USE

How we use products impacts their ability to clean, sanitize or disinfect.



Always read the label!

https://www.cdc.gov/hai/pdfs/howtoreadalabel-infographic-508.pdf

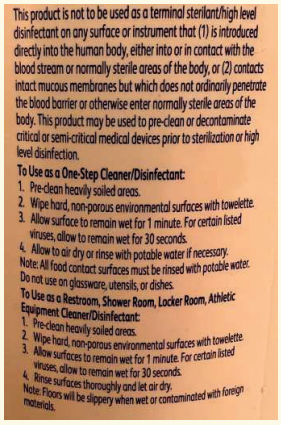


WHAT IS THE CONTACT TIME?

Cleaning procedure: Blood and other body fluids containing HIV or HBV or HCV must be thoroughly cleaned from surfaces and objects before application of this product. This cleaning may be accomplished with any cleaning solution, including this product.

Contact time: Leave surface wet for 3 minutes for HIV-1 and 5 minutes for HBV and HCV with 3 fl. oz. per gallon use-solution.

Disposal of infectious material: Blood and other body fluids must be autoclaved and disposed of according to local regulations for infectious waste disposal.



This product is not to be used as a terminal sterilant/high level disinfectant on any surface or instrument that (1) is introduced directly into the human body, either into or in contact with the blood stream or normally sterile areas of the body, or (2) contacts intact mucous membranes but which does not ordinarily penetrate the blood barrier or otherwise enter normally sterile areas of the body. This product may be used to pre-clean or decontaminate critical or semi-critical medical devices prior to sterilization or high level disinfection.

To Use as a One-Step Cleaner/Disinfectant:
1. Pre-clean heavily soiled areas.
2. Wipe hard, non-porous environmental surfaces with towelette.
3. Allow surface to remain wet for 1 minute. For certain listed viruses, allow to remain wet for 30 seconds.
4. Allow to air dry or rinse with potable water if necessary.

Note: All food contact surfaces must be rinsed with potable water. Do not use on glassware, utensils, or dishes.

To Use as a Restroom, Shower Room, Locker Room, Athletic Equipment Cleaner/Disinfectant:
1. Pre-clean heavily soiled areas.
2. Wipe hard, non-porous environmental surfaces with towelette.
3. Allow surfaces to remain wet for 1 minute. For certain listed viruses, allow to remain wet for 30 seconds.
4. Rinse surfaces thoroughly and let air dry.

Note: Floors will be slippery when wet or contaminated with foreign materials.

WHAT IS THE CONTACT TIME?

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2. Wipe hard, non-porous environmental surfaces with towelette.
3. Allow surface to remain wet for 1 minute. For certain listed viruses, allow to remain wet for 30 seconds.
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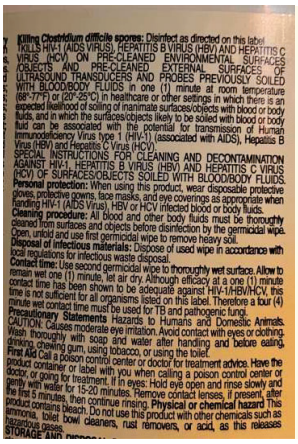

Killing Clostridium difficile spores: Disinfect as directed on this label. KILLS HIV-1 (AIDS VIRUS), HEPATITIS B VIRUS (HBV) AND HEPATITIS C VIRUS (HCV) ON PRE-CLEANED ENVIRONMENTAL SURFACES OBJECTS AND PRE-CLEANED EXTERNAL SURFACES OF ULTRASOUND TRANSDUCERS AND PROBES PREVIOUSLY SOILED WITH BLOOD/BODY FLUIDS in one (1) minute at room temperature (68°-77°F) or (20°-25°C) in healthcare or other settings in which there is an expected likelihood of soiling of inanimate surfaces/objects with blood or body fluids, and in which the surfaces/objects likely to be soiled with blood or body fluid can be associated with the potential for transmission of Human Immunodeficiency Virus type 1 (HIV-1) (associated with AIDS), Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV).
SPECIAL INSTRUCTIONS FOR CLEANING AND DECONTAMINATION AGAINST HIV-1, HEPATITIS B VIRUS (HBV) AND HEPATITIS C VIRUS (HCV) OF SURFACES/OBJECTS SOILED WITH BLOOD/BODY FLUIDS.
Personal protection: When using this product, wear disposable protective gloves, protective gowns, face masks, and eye coverings as appropriate when handling HIV-1 (AIDS Virus), HBV or HCV infected blood or body fluids.
Cleaning procedure: All blood and other body fluids must be thoroughly cleaned from surfaces and objects before disinfection by the germicidal wipe. Open, unfold and use first germicidal wipe to remove heavy soil.
Disposal of infectious materials: Dispose of used wipe in accordance with local regulations for infectious waste disposal.
Contact time: Use second germicidal wipe to thoroughly wet surface. Allow to remain wet one (1) minute, let air dry. Although efficacy at a one (1) minute contact time has been shown to be adequate against HIV-1/HBV/HCV, this time is not sufficient for all organisms listed on this label. Therefore a four (4) minute wet contact time must be used for TB and pathogenic fungi.
Precautionary Statements Hazards to Humans and Domestic Animals. CAUTION. Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.
First Aid: Call a poison control center or doctor for treatment advice. Have the product container or label with you when calling a poison control center or doctor, or going for treatment. 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. **Physical or chemical hazard** This product contains bleach. Do not use this product with other chemicals such as ammonia, toilet bowl cleaners, rust removers, or acid, as this releases hazardous gases.
STORAGE AND DISPOSAL

WHAT IS THE CONTACT TIME?

Cleaning procedure: All blood and other body fluids must be thoroughly cleaned from surfaces and objects before disinfection by the germicidal wipe. Open, unfold and use first germicidal wipe to remove heavy soil.

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WIPE THIS WAY

Some tips & tricks when using disposable "pop-up" wipes.

The following slides do not replace individual manufacturer's instructions for use.

Avoid Roping, Stranding or Snaking Wipes

- It's not a magic trick!
- Avoid pulling "ropes" or long strands of wipes at a time, given tendency to scrunch or ball the wipes.

“NO ROPES!”

Roping wastes wipes & contributes to increased healthcare costs.

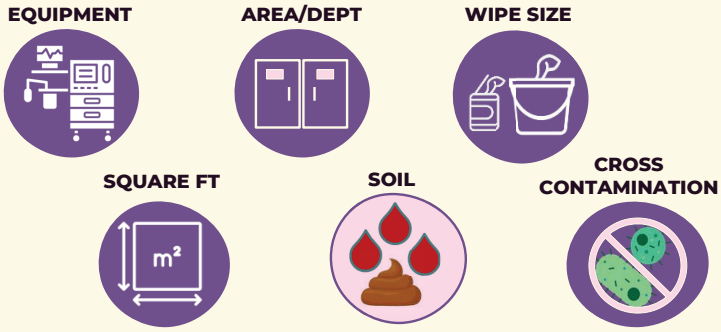
AVOID BUNCHING OR SCRUNCHING

- Scrunching, bunching or balling up the wipes doesn’t allow smooth, consistent application.
- Bunching the wipe promotes air pockets where disinfectant will not reach the surface.

KEEP WIPES FLAT

Think of painting a wall with a flat tool (brush or roller), versus trying to paint with a wad of cloth.

HOW MANY CLOTHS/WIPES PER CLEAN?



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Did you learn at least one new concept related to environmental hygiene in the last 45 minutes?

WRAPPING UP!

Know the difference

When we talk about killing germs, there is a **significant difference** between **cleaning**, **sanitizing** & **disinfecting**.

Surface consideration

Different areas, surfaces & objects need different levels of hygiene. Know what **products** are needed & **where** to perform your job safely & effectively.

Product application

How we apply chemicals, and with what tools, can impact the cleaning & disinfection process.

Thanks! Questions?

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REFERENCES

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