

# Module 2: Understanding Disinfectants

## Infection Prevention and Control Training for Environmental Services Staff

Healthcare-Associated Infections Program  
Center for Health Care Quality  
California Department of Public Health



# Objectives

- Review the difference between cleaning and disinfection
- Examine types of disinfectants
- Demonstrate how to select a disinfectant
- Identify key components of reading a disinfectant label
- Discuss on the importance of proper disinfectant dilution

## You Can Make a Difference!

- Improper cleaning and disinfection of environmental surfaces allow germs to spread and lead to infections
- **The Environmental Services (EVS) team can be the first line of defense against germs!**



# Cleaning Versus Disinfection

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## Cleaning

- Removing dust, dirt, and bodily fluids using water and detergent

## Disinfection

- Killing germs on hard, non-porous surfaces with a chemical called a disinfectant
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## Detergents

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- Use a detergent (Note: soap is a detergent)
- Detergent is mixed with water to lift the dirt off surface
- Removes but does not kill germs
- Germs can live in cleaning solution, change often
- Less toxic, less odor, and cheaper than disinfectants



## Disinfection and Disinfectants

- Chemicals that kill germs (e.g., quats, bleach, hydrogen peroxide)
- Used on hard, non-porous surfaces such as bedrails and bedside tables
- A one-step detergent-disinfectant product cleans and disinfects at the same time



| Disinfectant Type   | Properties  |
|---|---|
| <b>Quaternary Ammonium Products (Quats)</b>                               | <ul style="list-style-type: none"><li>• Widely-used</li><li>• Generally, doesn't kill spores</li><li>• Can cause health problems; ensure proper personal protective equipment (PPE) use</li></ul>                       |
| <b>Chlorine-based (Bleach)</b>  | <ul style="list-style-type: none"><li>• Kills a wide range of germs including spores</li><li>• Fast-acting</li><li>• Can cause health problems; ensure proper PPE use</li><li>• Can damage metals and fabrics</li></ul> |
| <b>Hydrogen peroxide, accelerated H<sub>2</sub>O<sub>2</sub> (Oxides)</b> | <ul style="list-style-type: none"><li>• Kills a wide range of germs including spores</li><li>• Can be shorter contact/wet time</li></ul>  |



Do not mix quats and bleach, as this can form a toxic gas.

# Cleaning Versus Disinfection

## Cleaning

- Scrubbing surfaces with water and detergent to physically removing dust, dirt, and body fluids

## Disinfection

- Killing germs on surfaces with chemicals

***Disinfectants can't work if cleaning doesn't happen first. Always remember to clean before disinfecting.***





## Is the Disinfectant Appropriate for the Task?

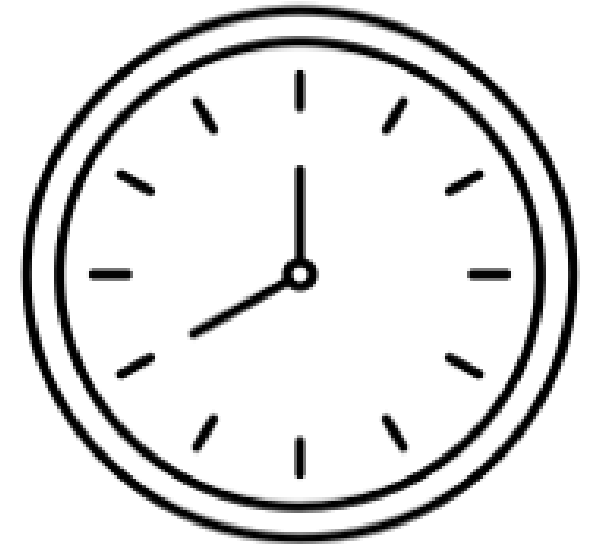
Always check if the disinfectant you are using is appropriate for the task. **Ask your EVS manager if unsure.**

- ✓ Environmental Protection Agency (EPA)-registered, and labeled as “hospital-grade disinfectant”
- ✓ Kill claims: Type of germs the disinfectant kills
- ✓ Contact/wet time: Time required for the disinfectant to work
- ✓ Safety: Know the toxicity, PPE requirements, and appropriate use of disinfectant



## Contact/Wet Time

- Contact/wet time is the **amount of time** required for a disinfectant **to kill germs** on a pre-cleaned surface
- A surface must remain **wet long enough** to achieve surface disinfection
  - You may have to re-apply to achieve the contact/wet time
- Follow **label instructions** for the appropriate contact/wet time



## Knowledge Check

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***In order for a disinfectant to be effective, what must occur?***

***Select all that apply.***

- A. Surface must be cleaned
  - B. Surface must remain wet for the disinfectant contact/wet time
  - C. EVS staff must know and use the disinfectant contact/wet time
  - D. All the above
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*In order for a disinfectant to be effective, what must occur?*

*Select all that apply.*

- A. Surface must be cleaned
  - B. Surface must remain wet for the disinfectant contact/wet time
  - C. EVS staff must know and use the disinfectant contact/wet time
  - D. All the above**
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# How to Read a Disinfectant Label

## 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?

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

**Directions for Use (Instructions for Use):** Where should the disinfectant be used? What germs does the disinfectant kill? What types of surfaces can the disinfectant be used on? How do I properly use the disinfectant?

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

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

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

**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?

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

**ACTIVE INGREDIENTS:**  
Alkyl (60% C14, 30% C16, 5% C12, 5% C18)  
Dimethyl Benzyl Ammonium Chloride .....10.0%  
OTHER INGREDIENTS: .....90.0%  
TOTAL: .....100.0%

EPA REG NO. 55555-55-55555

**CAUTION**

**Directions for Use**

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

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

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

**PRECAUTIONARY STATEMENTS:**  
Hazardous to humans and domestic animals. Wear gloves and eye protection.

**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: 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 (1-800-368-5048) 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.

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[How to Read a Disinfectant Label \(PDF\)](#)

([www.cdc.gov/hai/pdfs/HowToReadALabel-Infographic-508.pdf](http://www.cdc.gov/hai/pdfs/HowToReadALabel-Infographic-508.pdf))

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## Active Ingredients

- What are the main disinfecting chemicals?

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**Label Content:**

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Dimethyl Benzyl Ammonium Chloride .....10.0%

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**TOTAL:** .....100.0%

EPA REG NO. 58533-05-50333

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

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

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Pre-wash surface.  
Mop or wipe with disinfectant solution.  
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Rinse well and air dry.

**PRECAUTIONARY STATEMENTS:**  
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**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.

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## Precautionary Statements

- Confirm required PPE
- Review precautions

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## Storage and Disposal

- Identify storage and disposal recommendations

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**POISON CONTROL:** Call a Poison Control Center (1-800-368-5042) or doctor for treatment advice.

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**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?

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

**ACTIVE INGREDIENTS:**  
Alkyl (60% C14, 30% C16, 5% C12, 5% C18)  
Dimethyl Benzyl Ammonium Chloride .....10.0%

**OTHER INGREDIENTS:** .....90.0%

**TOTAL:** .....100.0%

EPA HI-G NO. 55555-55-55555

**CAUTION**

**Directions for Use**

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

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

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

**PRECAUTIONARY STATEMENTS:**  
Hazardous to humans and domestic animals. Wear gloves and eye protection.

**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: 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 (1-800-368-5048) 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.

EXPIRES: 01/2015  
EPA 55555-55-55555

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[How to Read a Disinfectant Label \(PDF\)](#)

([www.cdc.gov/hai/pdfs/HowToReadALabel-Infographic-508.pdf](http://www.cdc.gov/hai/pdfs/HowToReadALabel-Infographic-508.pdf))

# How to Read a Disinfectant Label

## Check Expiration Date

- Manufacturer's expiration date
- Open date/discard date
- Mix date/discard date

## 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?

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

**Directions for Use (Instructions for Use):** Where should the disinfectant be used? What germs does the disinfectant kill? What types of surfaces can the disinfectant be used on? How do I properly use the disinfectant?

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

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

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

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OTHER INGREDIENTS: .....90.0%  
TOTAL: .....100.0%

EPA REG NO. 55555-55-55555

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*Pseudomonas aeruginosa.*

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Pre-wash surface.  
Mop or wipe with disinfectant solution.  
Allow solution to stay wet on surface for at least 10 minutes.  
Rinse well and air dry.

**PRECAUTIONARY STATEMENTS:**  
Hazardous to humans and domestic animals. Wear gloves and eye protection.

**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: 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.  
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**POISON CONTROL:** Call a Poison Control Center (1-800-368-5048) 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.

EXPIRES 01/2025  
55555-55-55555

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Control and Prevention



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EPA REG NO. 55555-55-55555

**CAUTION**

**Directions for Use**

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

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*Staphylococcus aureus,*  
*Pseudomonas aeruginosa.*

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

**PRECAUTIONARY STATEMENTS:**  
Hazardous to humans and domestic animals. Wear gloves and eye protection.

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

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**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 (1-800-368-5048) 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.

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EPA REG. NO. 55555-55-55555

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Allow solution to stay wet on surface for at least 10 minutes.  
Rinse well and air dry.

**PRECAUTIONARY STATEMENTS:**  
Hazardous to humans and domestic animals. Wear gloves and eye protection.

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

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**POISON CONTROL:** Call a Poison Control Center (1-800-368-5048) 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.

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# How to Read a Disinfectant Label

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EPA REG. NO. 55555-55-55555

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Mop or wipe with disinfectant solution.  
Allow solution to stay wet on surface for at least 10 minutes.  
Rinse well and air dry.

**PRECAUTIONARY STATEMENTS:**  
Hazardous to humans and domestic animals. Wear gloves and eye protection.

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

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**POISON CONTROL:** Call a Poison Control Center (1-800-368-5049) 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.

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## Dilute Disinfectant Per Label Instructions

- **Always use disinfectant in correct dilution**
- **Never mix different disinfectants together**
- **Automated dispenser:** Automatically dispenses disinfectant mixed with water
- **Manual dispenser:** Requires careful measuring to manually mix concentrated disinfectant with water

# Preparing Environmental Cleaning Products: Manual Preparation

- Prepare solutions in a designated area (i.e., housekeeping closet)
- Follow label instructions
- Use accurate measuring tools (i.e., use a measuring cup). Never eyeball or guesstimate the measurement of disinfectant solution to water.
- Use PPE to prevent splashes or sprays

## Best Practices For Disinfectant Use

- ✓ Follow label instructions
- ✓ Use the appropriate disinfectant for the surface

### How to Read a Disinfectant Label

**Read the entire label!**  
The label is the law!

Always take a few moments to read the label carefully before you use a disinfectant.

**Active Ingredients:** What are the active ingredients of the disinfectant?

**EPA Registration Number:** How do you determine if a disinfectant is registered with EPA?

**Directions for Use (Instructions for Use):** What are the directions for use?

**Signal Words (Caution, Warning, Danger):** How do you determine if a disinfectant is a hazard to health or the environment through the label?

**Precautionary Statements:** How do you determine if a disinfectant is a hazard to health or the environment?

**First Aid:** What should you do if you get the disinfectant on your skin or in your eyes?

**Storage & Disposal:** How should you store and dispose of disinfectants?

**Directions for Use (Instructions for Use):** What are the directions for use?

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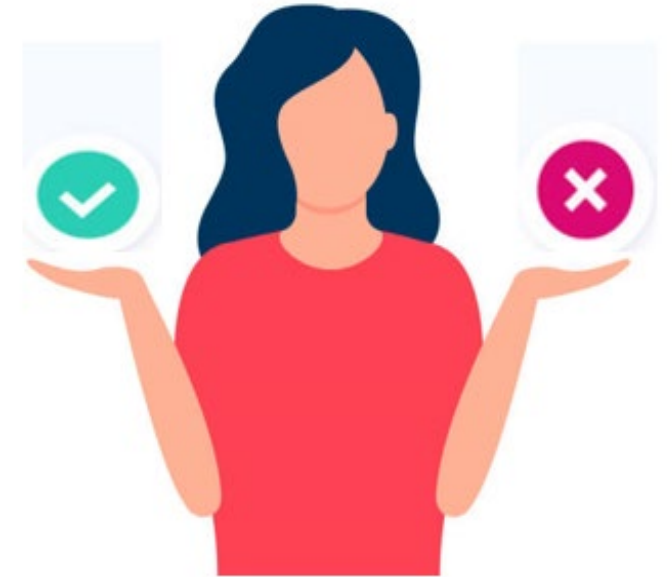
**Precautionary Statements:** How do you determine if a disinfectant is a hazard to health or the environment?

**First Aid:** What should you do if you get the disinfectant on your skin or in your eyes?

**Storage & Disposal:** How should you store and dispose of disinfectants?

## Best Practices For Disinfectant Use

- ✓ Follow contact/wet time
- ✓ Ensure the disinfectant dilution is accurate
- ✓ Ensure the right PPE for the job



## Practices to Avoid For Disinfectant Use

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- ✓ Don't mix or dilute unless specified on the label
- ✓ Don't "top off" or add new solution to containers
- ✓ Don't mix different disinfectants!



## Summary

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- Only clean surfaces can be disinfected
- Disinfectant choice depends on the surface being cleaned
- Follow the label instructions for use including contact/wet time
- Don't mix different disinfectants

## References

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([www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/SNF\\_OnlineIPCOURSE\\_Gs\\_Cleaning%20Disinfection%20Reprocessing\\_012521\\_ADA.pdf](http://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/SNF_OnlineIPCOURSE_Gs_Cleaning%20Disinfection%20Reprocessing_012521_ADA.pdf))
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## Project Firstline Resources

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Visit the [Project Firstline Website](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/ProjectFirstline.aspx)

([www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/ProjectFirstline.aspx](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/ProjectFirstline.aspx))

Email the Project Firstline AskBox

[ProjectFirstline@cdph.ca.gov](mailto:ProjectFirstline@cdph.ca.gov)

Project Firstline is a national collaborative led by the U.S. Centers for Disease Control and Prevention (CDC) to provide infection control training and education to frontline healthcare workers and public health personnel. The California Department of Public Health Healthcare-Associated Infections (HAI) Program is proud to partner with Project Firstline, as supported through Strengthening HAI/AR Program Capacity (SHARP) funding. CDC is an agency within the Department of Health and Human Services (HHS). The contents of this presentation do not necessarily represent the policies of CDC or HHS and should not be considered an endorsement by the Federal Government.



## ACTIVITY TEACHING AIDES / WORKSHEETS



# How to Read a Disinfectant Label

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What are the main disinfecting chemicals?

ACTIVE INGREDIENTS:  
Alkyl (60% C14, 30% C16, 5% C12, 5% C18)  
Dimethyl Benzyl Ammonium Chloride.....10.0% OTHER  
INGREDIENTS:.....90.0%  
TOTAL:.....100.0%

## EPA Registration Number:

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

EPA REG NO. 55555-55-55555

## Directions for Use (Instructions for Use):

Where should the disinfectant be used?

What germs does the disinfectant kill?  
What types of surfaces can the disinfectant be used on?

How do I properly use the disinfectant?

## Contact Time:

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

## Directions for Use

### INSTRUCTIONS FOR USE:

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

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

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Pre-wash surface.  
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Allow solution to stay wet on surface for at least 10 minutes.  
Rinse well and air dry.

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## CAUTION

PRECAUTIONARY STATEMENTS:  
Hazardous to humans and domestic animals. Wear gloves and eye protection.

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: 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.

## Signal Words (Caution, Warning, Danger):

How risky is this disinfectant if it is swallowed, inhaled, or absorbed through the skin?

## Precautionary Statements:

How do I use this disinfectant safely? Do I need PPE?

## 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?

## Storage & Disposal:

How should the disinfectant be stored? How should I dispose of expired disinfectant? What should I do with the container?



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## Case Scenario #1

You have a new resident coming in. The nursing staff is putting pressure on EVS staff to clean the room faster and to have it ready soon. The contact/wet time for the product you use is 5 minutes, but nursing staff is asking you to ‘speed it up’.

How do you proceed with cleaning and disinfecting? Select all that apply.

- A. Let it dry quickly
- B. Wait the 5 minutes and allow it to dry
- C. Wipe it off so it dries faster
- D. Ignore the nursing staff
- E. Other (Share your response)



5-minute  
contact/wet time

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- A. Let it dry quickly
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- C. Wipe it off so it dries faster
- D. Ignore the nursing staff
- E. **Other (Share your response)\***

\*E may be a correct response depending on facility policy and procedure.

## Case Scenario #1 Continued

**How would you respond to the situation? What could you do if you're being pressured to clean a room faster than you are able to?**

- A. Contact EVS supervisor, let them know what's going on
- B. Inform the nursing staff of the products contact/wet time to make the room/surface safe for the next resident
- C. Ask EVS supervisor for assistance (maybe they can get extra EVS staff to help)
- D. Open lines of communication between nursing staff and EVS to ensure each other's deadlines and limitations
- E. Involve facility's infection preventionist and let them know this is an (ongoing) situation
- F. All of the above

## Case Scenario #1 Continued Answer

**How would you respond to the situation? What could you do if you're being pressured to clean a room faster than you are able to?**

- A. Contact EVS supervisor, let them know what's going on
- B. Inform the nursing staff of the products contact/wet time to make the room/surface safe for the next resident
- C. Ask EVS supervisor for assistance (maybe they can get extra EVS staff to help)
- D. Open lines of communication between nursing staff and EVS to ensure each other's deadlines and limitations
- E. Involve facility's infection preventionist and let them know this is an (ongoing) situation
- F. All of the above

## Case Scenario #2

**A product has a 10-minute contact/wet time, but it dries in 5 minutes. What do you do? Select all that apply.**

- A. Reapply the product to ensure it stays wet for the entire 10 minutes
- B. Add water to the surface so it stays wet longer
- C. Let the EVS manager know that you are having to rewet the surface to achieve the contact/wet time
- D. Use another product from home
- E. Nothing



## Case Scenario #2 Answer

A product has a 10-minute contact/wet time, but it dries in 5 minutes. What do you do? Select all that apply.

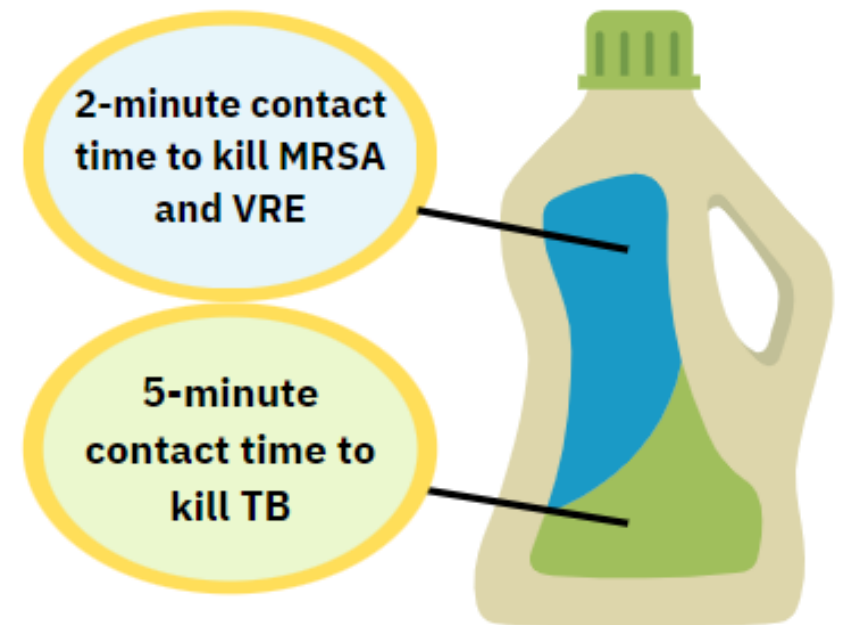
- A. **Reapply the product to ensure it stays wet for the entire 10 minutes**
- B. Add water to the surface so it stays wet longer
- C. **Let the EVS manager know that you are having to rewet the surface to achieve the contact/wet time**
- D. Use another product from home
- E. Nothing

## Case Scenario #3

You are using a disinfectant product that has different contact/wet times. This disinfectant product has, a 2-minute contact time to kill MRSA & VRE and a 5-minute contact time to kill TB.

Which contact/wet time would you use?

- A. The shortest time
- B. The longest time
- C. The average time
- D. The expiry date
- E. At midnight

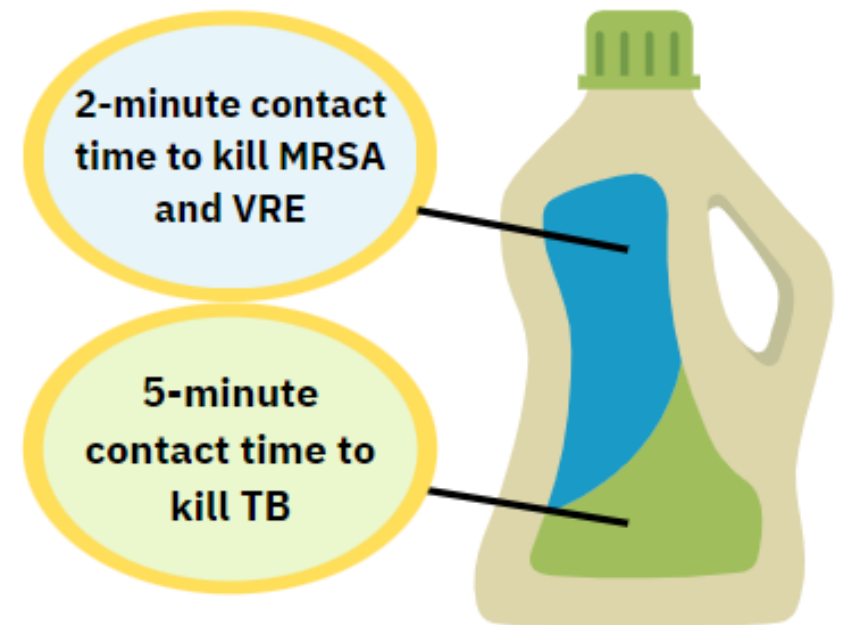


## Case Scenario #3

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Which contact/wet time would you use?

- A. The shortest time
- B. **The longest time**
- C. The average time
- D. The expiry date
- E. At midnight



## Picture This: What to Look for in an EVS Closet

Identify 6 areas for improvement.

