



# Safer Cleaning & Disinfecting Training

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# Background

Some cleaners and disinfectants can be hazardous to worker health and indoor air quality. However, these hazards can be controlled or even eliminated. The most effective method of control is to substitute a less hazardous material for a hazardous one. This strategy has been effectively used in many cases and in many industries and is a cornerstone to OSHA's Hierarchy of Controls for all occupational hazards.

*The Rhode Island Department of Environmental Management (RIDEM), with funding from USEPA and in partnership with Rhode Island Committee on Occupational Safety and Health (RICOSH) and Northeast Waste Management Officials' Association (NEWMOA), is embarking on a project to encourage this approach throughout the janitorial and housekeeping community and schools in Rhode Island and Southeastern New England.*





## Training Overview

- what is cleaning and disinfecting
- health impacts of traditional chemistries
- assessing product ingredients
- chemicals of concern
- switching to safer alternatives
- effective cleaning and disinfective to combat Covid-19







## Cleaning

- **Cleaning** means removing organic matter, salts, oils, grime and visible soils with detergents or soap and rinsing with water. Sometimes this will help remove numbers of microorganisms.
- Cleaning must be performed before any application of a disinfectant.







# Disinfecting

- **Disinfecting** means killing germs on surfaces, preventing them from spreading.
- If a surface is not cleaned first, **germs can hide under soils and reduce the efficacy of the disinfectant.**



# KNOWLEDGE CHECK

Disinfection should come before cleaning

**TRUE OR FALSE**



# Health Impacts of Hazardous Cleaning & Disinfecting Products

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- Massachusetts' surveillance registry on work-related asthma found that 18% of all confirmed cases from 2003-2013 were due to exposure to cleaning products.
- In some rare cases the outcome is more dire. In 2019, a Massachusetts food service worker died from exposure to incompatible cleaning products.



# Worker Health & Safety Impacts



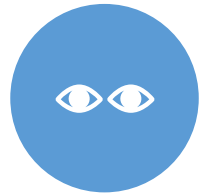
Health risks of traditional products



Headaches



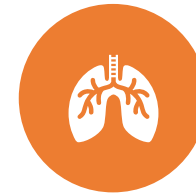
Itchy skin, rashes, chemical burns



Irritated eyes



Cause or trigger asthma



Enter the body through the skin or lungs



Increased risk of cancer





## Hazardous Cleaning & Disinfecting Products & Safer Alternatives

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Choosing more benign cleaning and disinfecting products requires a systematic approach:

- Identify what is to be cleaned (areas, rooms, surfaces, etc.) and to what the cleaning objectives are.
- Identify and recognize of the hazards of cleaning products from labels, Safety Data Sheets, and OSHA HCP (Right to Know Training) training.
- Explore and evaluate alternatives to conventional cleaning chemicals and disinfectants.
- Adopt state-of-the art cleaning and disinfecting practices.



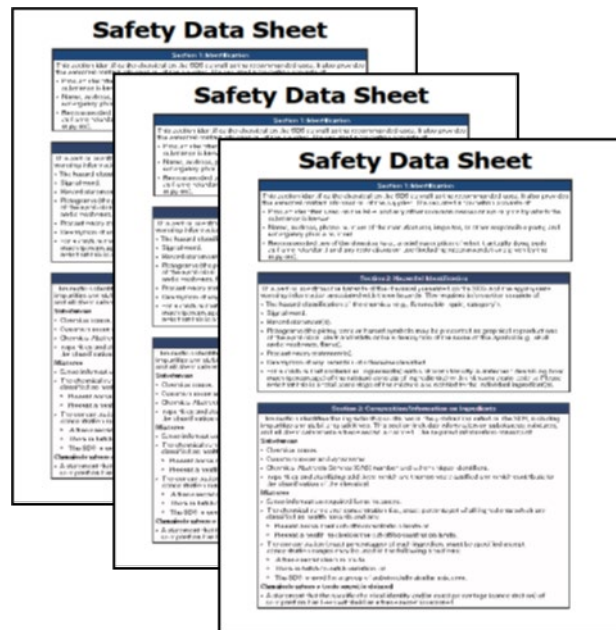
# Start with Safety Data Sheets



- Safety Data Sheets (SDS) are documents designed to identify hazards of a chemical product and illustrate methods to control exposure.
- They are the cornerstone of all chemical hazard recognition and regulation.
- SDS must be obtained and maintained for all hazardous chemicals under the federal OSHA Haz Comm Rule on Hazard Communication [1910.1200].



# A SDS is a document designed to answer key questions



- What is the identity of the product?
- How is it labeled?
- What are the hazards of the product?
- How are workers exposed to the product?
- What are the products health effects?
- What methods can control exposure?
- What can happen in the case of a spill or accidental release?
- How should the product be handled or stored safely?





# SDS

- Though invaluable, SDSs can be complicated to read, often fail to report all ingredients and hazards, and may overstate or understate hazards.
- Many jurisdictions have agencies that can help to 'translate' SDSs such as COSH groups, industrial hygiene and environmental services, university occupational health and safety projects, local health department OSHA consultation assistance, local USOSHA office compliance assistance, and many worker compensation insurers.
- SDSs must be readily accessible during each work shift to employees when they are in their work area(s).
- Electronic alternatives to paper safety data sheets are permitted if there are no barriers to immediate employee access.





# Active Ingredients of Concern

- Sodium Hypochlorite (Bleach)
- Quaternary Ammonium Compounds (Quats)
- Phenols





# Sodium Hypochlorite (Bleach)

- Bleach is a known asthmagen.
- Mixing sodium hypochlorite solutions with ammonia causes the release of chlorine gases, which can quickly cause nose, eye, and throat irritation, and even death.



# Sodium Hypochlorite (Bleach)

- Bleach should never be used on stainless steel, aluminum, copper, brass, marble, or granite, as it corrodes many metals.
- Bleach is a disinfectant, not a cleaner, and it can be neutralized by dirt or other organic materials so surfaces must be cleaned before you use bleach.
- The hazard of having to use other cleaners in conjunction with bleach is that mixing bleach with many cleaners creates toxic gases, and the person doing the cleaning needs to know what chemicals they can and cannot use with bleach.

**SODIUM HYPOCHLORITE**

AVOID CONTACT WITH SKIN, EYES OR CLOTHING

CORROSIVE

AVOID BREATHING FUMES OR VAPOR

DO NOT TAKE INTERNALLY

**DANGER**

CAUSES SEVERE EYE IRRITATION. CAN CAUSE SKIN DAMAGE. FUMES FROM SPILLS ARE VERY IRRITATING TO MUCOUS MEMBRANES.

WEAR CHEMICAL GOGGLES, RUBBER GLOVES, APRON AND BOOTS. WHEN FUMES ARE PRESENT, USE NIOSH APPROVED RESPIRATOR WITH ACID TYPE CANISTER. AVOID CONTAMINATION WITH HEAVY METALS, REDUCING AGENTS, ORGANICS, ETHER, AMMONIA AND ACIDS.

ANTIDOTE:

GET IMMEDIATE MEDICAL PHYSICIAN ATTENTION FOR ALL BELOW:  
EYES - FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. SKIN - WASH WITH PLENTY OF WATER. REMOVE ALL CONTAMINATED CLOTHING. INHALATION - REMOVE TO FRESH AIR. KEEP PATIENT BREATHING. INGESTION - DRINK WATER OR MILK. DO NOT USE BAKING SODA OR ACIDIC ANTIDOTES.



# Quaternary Ammonium Compounds (Quats)

- A group of chemicals that can cause numerous short- and long-term health issues.
- Exposure to the skin can cause dermatitis.
- Farmers who have used pesticides containing quats have higher rates of chronic respiratory issues.
- Quats are known asthma inducers, as they can worsen and aggravate pre-existing asthma, and can trigger new cases of asthma.
- In 3 separate studies, disinfectants containing quats were used to clean the cages of lab mice, and those mice had decreased fertility as well as increased rates of birth defects of their offspring.
- In those same studies, the residue from the Quats remained on the cages for months after its use was discontinued.





# Commonly Used Quaternary Ammonium Compounds

- Benzalkonium chloride
- Benzethonium chloride
- Alkyl dimethyl benzyl ammonium chlorides (C12-16)
- Alkyl dimethyl benzyl ammonium chloride (C14 60%, C16 30%, C12 5%, C18 5%)
- Alkyl dimethyl ethylbenzyl ammonium chloride (C12-14)
- Alkyl dimethyl ethylbenzyl ammonium chlorides (C12-18)
- Didecyl dimethyl ammonium chloride
- Dioctyl dimethyl ammonium chloride





# Phenols

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Phenols are asthmagens according to The Collaborative for Health and the Environment's (CHE) Toxicant Disease Database.

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The Toxics Use Reduction Institute (TURI) at UMass Lowell specifically recommends against using cleaning products that contain phenols.



# What is Safer Cleaning and Disinfecting and Why Should You Care?



**It is not just about changing out the products you use; it is also about changing the approach to cleaning and disinfecting.**



## **Safer Cleaning & Disinfecting:**

Looks at the whole process of cleaning & disinfecting  
Protects the health of students and staff  
Changes out toxic product for greener cleaning & safer disinfecting products



# Choosing Alternative Cleaners

- Alternative cleaning products should have labels and an accompanying SDS that identify any hazards—as required by OSHA.
- Review the product literature from the supplier to understand how to prepare the product. (Third party certification sites also have helpful information.)
- Ask product vendors for training materials and programs, which is also a requirement for Green Seal certification. (See below for more information on Green Seal.)





# KNOWLEDGE CHECK

It doesn't matter what cleaning products you use, as long as you use something!

**TRUE OR FALSE**



# How Do You Know if a Cleaner is Green?

## Third Party Certification

- Green Seal
- EcoLogo
- SaferChoice

## Key Features

- Biodegradable
- Low VOC (volatile organic compound) content
- Low impact on indoor air quality (IAQ)
- Non-irritant to users and occupants
- Concentrated



## Choosing Alternative Cleaners

- Consider the form of the product (liquid, fine powder, granule; concentrated or dilute) and how its preparation or use might have a potential for hazardous exposure to ***housekeeping or custodial staff***.
- Some compounds will arrive in enclosed containers or packets ready for use and others will arrive in highly concentrated or powder form and need to be mixed or diluted.
- *Many alternative cleaners are corrosive and can cause damage to skin, eyes, and respiratory tract.*







## Transitioning to Alternative Cleaners

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- Feedback/training for workers is a cornerstone of any *truly green* approach.
- Many workers employed in cleaning operations often have limited English speaking and reading proficiency, so multilingual/multimodal training is essential.
- Do not have to use disinfectants every time you clean.
- Maintain a cleaning and disinfecting log with date/time and scope/area.





# How to Use Green Cleaners



Green cleaners are as effective as traditional, but for tougher stains allow to sit on surfaces two minutes.



Even if green cleaners don't bubble or foam, they are still cleaning.



Same is true even if they are odorless.



Follow manufacturers' instructions on use and mixing.



Use dispensers to save product, guarantee cleaners are mixed properly, and prevent accidents.



# Green Cleaning Best Practices

## Dusting

- Use microfiber cloths – they can be laundered and reused up to 500x.
- Spray the cloth, not the surfaces to reduce exposure.
- Use neutral window cleaners with a squeegee and a wipe.

## Hard Floor Cleaning

- Use mats at all entrances and clean daily.
- Vary the method of cleaning based on the need – light (microfiber dust mop); medium (damp microfiber mop); heavy (microfiber string mop w\green cleaner).

## Carpet Cleaning

- Use HEPA (high-efficiency particulate air) vacuums so particles don't get back into air.
- Wear a dust mask and open windows and doors when vacuuming.
- Use carpet cleaning chemicals only when necessary.



# Bathrooms



Increase ventilation when cleaning



Only use green cleaners (of course)



Wear personal protective equipment (PPE)



Do the dry cleaning first, then the wet cleaning



Flush the floor drain regularly with enzymes to prevent germs and flies



Let cleaner sit in bowl and on the seat to disinfect



Allow disinfectants to sit for a few minutes



Use sink hand plungers or enzyme-based product in place of caustic products in clogged drains





# COVID-19

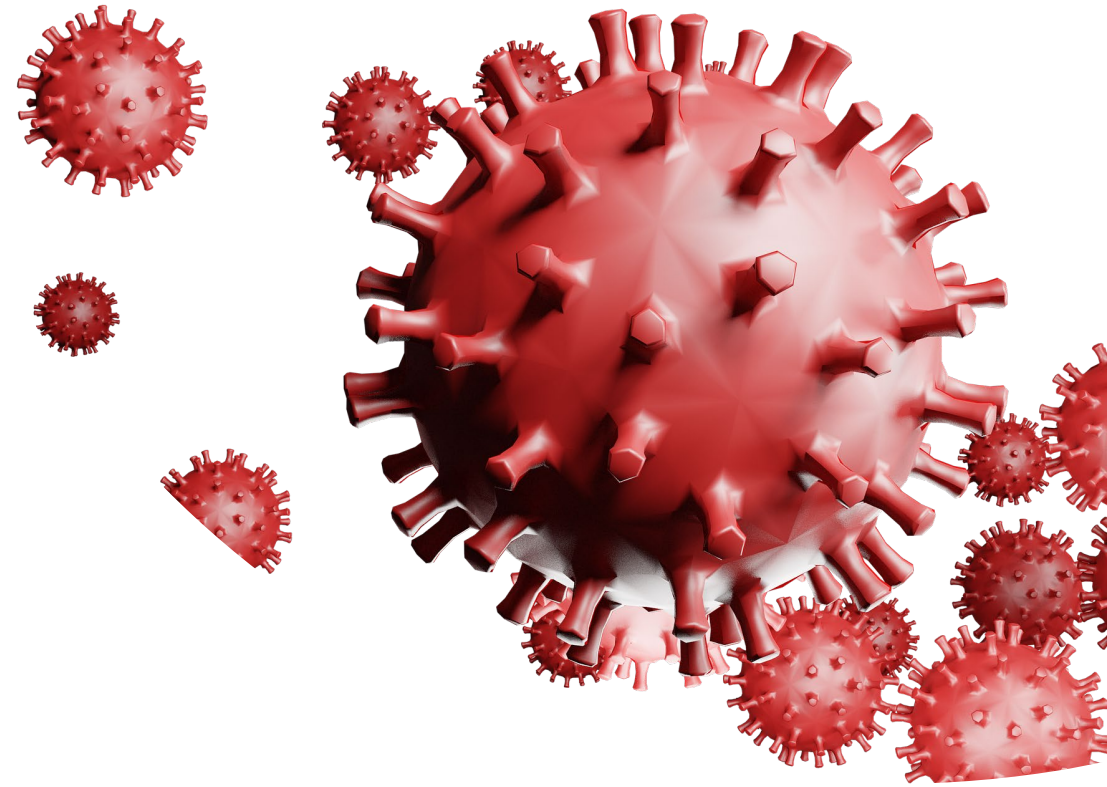
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- “There have been increasing studies on contamination of the healthcare environment with SARS-CoV-2 RNA but few studies assessed the presence of viable virus. Further, no study has definitely described healthcare-associated transmission and infections via environmental surfaces and medical devices as a fomite...”
  - Hajime Kanamori, MD, PhD, MPH, David J Weber, MD, MPH, William A Rutala, PhD, MPH, The role of the healthcare surface environment in SARS-CoV-2 transmission and potential control measures. *Clinical Infectious Diseases*, , ciaa1467, September 28, 2020.
- “Although our understanding is still incomplete, the balance of evidence to date does not support environmental surface contamination as a key driver of SARS-CoV-2 spread.”
  - Craig S Conover, MD, MPH, Transmission of SARS-CoV-2 via Contaminated Surfaces: What is to be Done? *Clinical Infectious Diseases*, , ciaa1586, October 18, 2020.





- CDC's guidance issued on April 5, 2021, only a few situations call for cleaning more frequently or disinfecting in shared spaces. These conditions are:
    - Communities with a high transmission rate of COVID-19
    - Low number of people wearing masks and infrequent hand hygiene
    - Spaces occupied by certain populations, such as people at increased risk for severe illness from COVID-19
    - If there has been a sick person or who tested positive for COVID-19 in your facility within the last 24 hours, clean AND disinfect the space.
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# Cleaning and Disinfecting In the Era of COVID-19

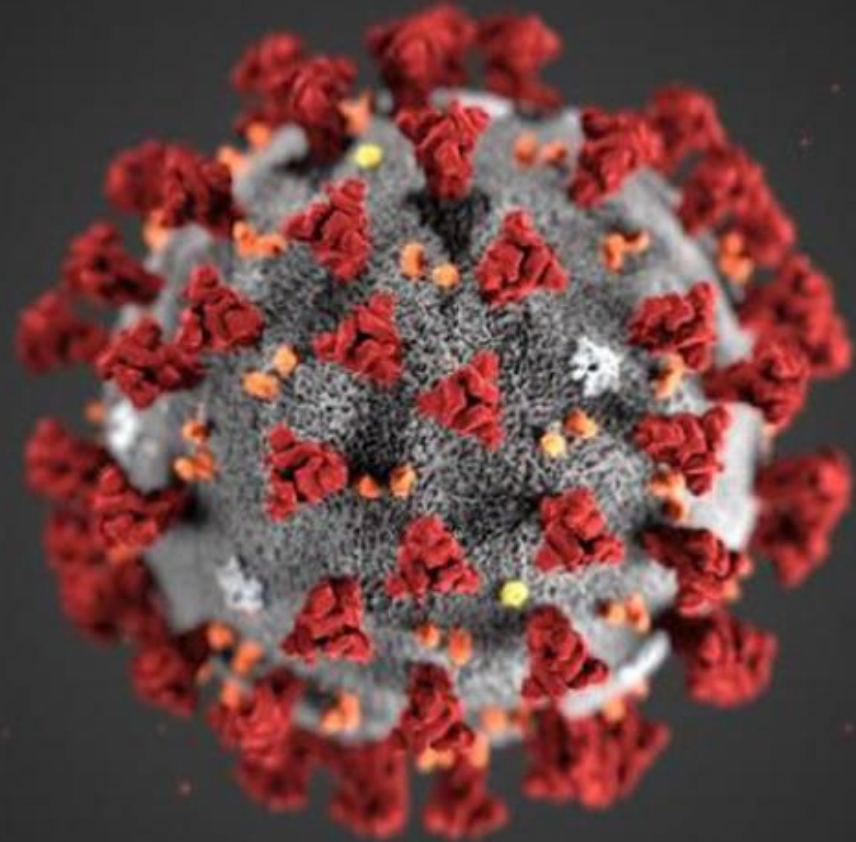


# ‘Moderation in All Things’

The risk of catching COVID-19 from a surface — while theoretically possible — is extremely low. Many studies have confirmed this, which is why the CDC recently relaxed its guidelines on deep cleaning and disinfection.

Surface cleaning with water and soap once a day is generally sufficient, unless there has been a suspected or confirmed case of COVID-19 in the prior 24 hours. If a suspected or confirmed case becomes known, disinfection of all affected indoor areas is recommended.

This means that measures such as closing for deep cleanings or quarantining library books are not recommended.



# Disinfection in Schools

- Regular disinfecting is only required in spaces where someone has tested positive, there are sensitive populations, or when there are high transmission rates.
- Beyond personal hand sanitizers, do NOT allow teachers and students to bring any cleaning/disinfecting products into the classroom.
- Clean and rinse all surfaces prior to disinfecting; disinfectants usually only work on hard surfaces.
- In schools where students don't change desks throughout the day, disinfecting is not needed as often.
- Isopropyl alcohol (>70%) is recommended to disinfect keyboards.
- All cleaning and disinfecting procedures should follow [CDC Guidance](#).





## Fogging, Misting, & Electrostatic Spraying Using Disinfectants/Sanitizers

- Only apply disinfectant to surface types listed on the product.
- Follow application directions on the label.
- NEVER apply disinfectants or sanitizers to humans or clothing using misters/foggers.
- From EPA - “Application by fogging/misting results in much smaller particle sizes, different surface coverage characteristics, and potentially reduced efficacy when compared to sanitization or disinfection product applications by spraying, sponging, wiping or mopping”.
- Electrostatic sprayers work by charging the antimicrobial liquid as it passes through a nozzle. The positively charged antimicrobial droplets are attracted to negatively charged environmental surfaces allowing for improved coverage on hard, non-porous environmental surfaces.





# EPA's List N Registered Antimicrobial Products

- [US Environmental Protection Agency \(EPA\) List N: EPA's Registered Antimicrobial Products for Use Against Novel Coronavirus SARS-CoV-2](#). Most of the 350 disinfectants have hazards, as most antimicrobial pesticides do.
- Many include ingredients that can cause asthma (sodium hypochlorite [bleach], quaternary ammonium compounds [quats], peracetic acid).
- EPA also has a list of [safer active disinfectant ingredients](#) identified by EPA's Safer Choice program, which includes hydrogen peroxide, alcohol (isopropanol or ethanol), citric acid, l-lactic acid, caprylic acid, peroxyacetic acid, and sodium bisulfate.



# Third Party Certified & Authoritative Lists of Cleaners & Disinfectants

## Third-Party Certified

- [Green Seal](#) & [ECOLOGO®](#) are well established and rigorous sustainability standards. Certification ensures that a product's entire life-cycle meets stringent scientific criteria. When a product is certified, purchasers are assured of its sustainability.

## [RI DEM](#) Green Cleaning

- This list is a subset of the EPA N List; formulations including the four troublesome chemistries mentioned previously have been removed and greener chemistries have been highlighted.



## Other Resources on Green Cleaners & Disinfectants

- *Toxics Use Reduction Institute* ([www.turi.org](http://www.turi.org)) at UMASS Lowell. The Toxics Use Reduction Institute Green Cleaning Lab offers housekeepers and janitorial service providers information it has gained from two decades of testing the performance of green cleaning products and equipment.
- *Inform* ([www.informinc.org](http://www.informinc.org)). INFORM's Cleaning for Health project aims to protect custodial workers, students, and other building occupants, and the environment from the adverse impacts of cleaning chemicals by identifying toxic substances of concern and promoting the use of safer products and practices.
- *San Francisco Dept. of Environment* ([sfapproved.org](http://sfapproved.org)). SF Approved allows users to explore green products & services that meet San Francisco's health & environmental requirements.
- *Practice Greenhealth* ([practicegreenhealth.org](http://practicegreenhealth.org)). Provides environmental solutions for the health care sector and lends support to create better, safer, greener workplaces and communities.



# Acknowledgements/Sources

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- Rhode Island Committee on Occupational Safety and Health (RICOSH).
- Northeast Waste Management Officials' Association (NEWMOA).
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- Toxic Use Reduction Institute (TURI).





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