Cleaning, Sanitizing, Disinfecting and Sterilizing – Quick Tips



Most of us know how to properly wash our hands—wet, lather, scrub, rinse, dry—but we may be less clear on how to properly clean, sanitize, disinfect, or sterilize the various surfaces in our workplaces. Many pathogens are found on workplace surfaces, and frequent cleaning, sanitizing, disinfecting and sterilizing helps to prevent the spread.

Cleaning

Cleaning is the vital first step. According to the Environmental Protection Agency (EPA), there is a formal definition of “clean.” Cleaning involves removing surface debris and foreign material using water, detergent or enzymatic products. Items must be cleaned before they are sanitized, disinfected or sterilized.

Sanitizers, Disinfectants and Sterilants

What are sanitizers? According to the EPA, sanitizers must kill 99.9% of bacterial within two hours of exposure. This category is generally made up of chemical sprays, gels and topical agents that are not suitable for extended exposure and must be used regularly because they do not kill continuously and must be repeated if recontamination occurs. Sanitizers are sometimes referred to as hand antiseptics.

What are disinfectants? Disinfectants must kill 100% of bacteria, fungi and viruses within 15 minutes of exposure. Disinfectants may be classified as high, medium or low level depending upon their kill strength. Disinfectants are not only stronger than sanitizers, they are also more toxic and are only to be used on hard, inanimate objects. They are not approved for any exposure to human tissues. Like sanitizers, they do not kill continuously, so consistent reapplication is required.

What are sterilizers? Sterilizers must kill 100% of all forms of microbial life (bacteria, fungi, viruses and spores) within two minutes. Sterilizers can be devices such as autoclaves (which use high-pressure steam) as well as liquid chemicals.

Regulatory Guidance

Chemical germicides formulated as sanitizers, disinfectants, or sterilants are regulated by the EPA under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Under FIFRA, any substance or mixture of substances intended to prevent, destroy, repel or mitigate any pest (including microorganisms but excluding those in or on living humans or animals) must be registered before sale or distribution.

The EPA maintains a page of all registered disinfectants, including links to lists (A-N) of products registered against common pathogens. Manufacturers are required to test products using pre-established test procedures on product stability, toxicity to people and microbial activity. If the product passes these requirements, it is registered by the agency as ready for trade and listed on their registered disinfectant page.

The Food and Drug Administration (FDA) oversees sterilants and high-level disinfectants for use on medical devices as well as sanitizers (antiseptics) or drugs used on or in the human body. This includes antimicrobial soaps, antiseptics, scrubs and wound protectants.

Selection of Disinfection and Sterilization Method

There are a number of factors that determine the effectiveness of a disinfection or sterilization method according to the Centers for Disease Control and Prevention (CDC). Some are due to the intrinsic qualities of the organism and others are due to the chemical and external physical environment. Having a general awareness of these factors will aid in what method should be selected:

- Number and location of the microorganism
- Innate resistance of microorganism
- Concentration and potency
- Physical and chemical factors
- Organic and inorganic matter
- Duration of exposure
- Biofilms

Common Chemical Disinfectants

CDC identifies common chemical disinfectants in their guideline for disinfection and sterilization for healthcare facilities. They are generally divided according to their chemical composition and class. It provides an overview, mode of action, microbicidal activity and use for these 11 chemical disinfectants:

- Alcohol
- Chlorine and chlorine compounds
- Formaldehyde
- Glutaraldehyde
- Hydrogen peroxide
- Iodophors
- Ortho-phthalaldehyde (OPA)
- Peracetic acid
- Peracetic acid and hydrogen peroxide
- Phenolics
- Quaternary ammonium compounds

Preventing and responding to communicable diseases in the workplace starts with understanding cleaning, sanitizing, disinfecting and sterilizing chemicals and processes. Many resources are available to verify the safety and efficacy and suggest which chemicals might be most appropriate for specific microorganisms and work settings.

Commonly Asked Questions

Q: How do I know if a particular disinfectant/sterilant will kill the pathogen I am concerned about?

A: For healthcare settings, reference the FDA cleared list of sterilants. For all other settings outside of healthcare, reference the EPA lists of registered disinfectants/sterilants. Both the EPA and FDA lists will verify claims made by the manufacturer and guide in product selection.

Q: How can I find hand sanitizers listed with the FDA, or verify that a company has listed its product with the FDA?

A: The FDA publishes product listing information provided by the companies that make the drug on the National Drug Code (NDC) Directory. This listing does not mean the drug is approved by FDA. Anyone can look up a drug product and download the information by searching on its NDC, company name or drug name. For a list of all hand sanitizers, choose the proprietary name search, and search for the term "hand sanitizer."

Q: Can disinfectants be used as antiseptics?

A: No. Disinfectants are designed for hard surfaces and might be too strong for skin or tissue. Conversely, antiseptics might not be strong enough to provide for thorough disinfection of hard surfaces.

Sources

Centers for Disease Control and Prevention's (CDC) Guideline for Disinfection and Sterilization in Healthcare Facilities, May 2019
Centers for Disease Control (CDC): Chemical Disinfectants, September 2016

Environmental Protection Agency (EPA) list of registered disinfectants

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and Federal Facilities

FDA-Cleared Sterilants and High Level Disinfectants with General Claims for Processing Reusable Medical and Dental Devices

Food and Drug Administration (FDA): Content and Format of Premarket Notification [510(k)] Submissions for Liquid Chemical Sterilants/ High Level Disinfectants

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