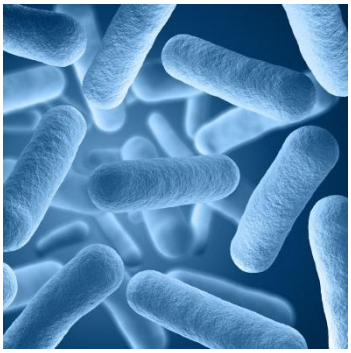
The Terms of Germ Inactivation

By the Water Quality & Health Council



Reducing disease-causing microorganisms—aka "pathogens" or "germs"—on environmental surfaces is a matter of using the right agent for the task at hand. You would no sooner wash your hands in a bleach solution after gardening than expect surgical instruments to be prepared by washing them in soapy water.

Terms that apply to germ reduction on surfaces—cleaning, sanitizing, disinfecting and sterilizing—have distinct definitions, but they are often misused. To help you navigate these terms, please see the table below:

Vocabulary of Germ Inactivation on Environmental Surfaces[1]

TERM	PURPOSE	USE	EXAMPLES of AGENTS	NOTES
Cleaning	Removes visible dirt, impurities and pathogens using chemical or physical means.	Cleaning is appropriate when surfaces are visibly dirty. When a surface is both visibly dirty and contaminated, and requires sanitizing or disinfecting, cleaning is the first step.	Water, detergent, enzymatic products	Cleaning does not remove all pathogens and does not necessarily kill them. If cleaning tools are used on multiple surfaces before being sanitized, cross-contamination can occur.
Sanitizing	Lowers the number of pathogens on surfaces using chemical or physical means. Pathogen numbers are lowered to a safe level, which is determined by a given public health standard or set of requirements.	Food-contact surfaces such as commercial deli slicers must be cleaned and sanitized on a regular basis. Other examples are the diaper-changing tables	Water, detergent, enzymatic products, also liquid chemicals (e.g., alcohols, glutaraldehyde, formaldehyde, hydrogen peroxide, iodophors, ortho-phthalaldehyde, peracetic acid, phenolics, quaternary ammonium	Sanitizing works by cleaning and/or disinfecting to lower the risk of spreading infection. Sanitizing is often thought to be synonymous with disinfecting, but there is a subtle difference in that sanitizing lowers pathogen numbers to a particular standard.

[1] CDC sources include: Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008 and How to Clean and Disinfect Schools to Help Slow the Spread of Flu

		in day care centers and shared toys.	compounds, and sodium hypochlorite bleach solutions), wet pasteurization	
Disinfecting	Kills many or all pathogens on surfaces (except bacterial spores) using chemical or physical means. There are different degrees of disinfection depending on the purpose or use of the item being disinfected.	Low level disinfection is used for example for common items, such as toilets that do not pose significant risk while high level disinfection is used in healthcare for items that enter the body, such as endoscopes.	Liquid chemicals (e.g., alcohols, glutaraldehyde, formaldehyde, hydrogen peroxide, iodophors, ortho-phthalaldehyde, peracetic acid, phenolics, quaternary ammonium compounds, and sodium hypochlorite bleach solutions), wet pasteurization	For soiled surfaces, disinfecting should follow cleaning to ensure the disinfectant is not "used up" in reacting with dirt and other impurities.
Sterilizing	Destroys all forms of microbial life, including bacterial spores, using chemical or physical means.	Surgical instruments must be sterile.	Gamma and x-ray radiation Ethylene oxide gas, steam under pressure, dry heat, hydrogen peroxide gas plasma, liquid peracetic acid	Sterilizing is preceded by cleaning. There is no validity to the term "partially sterile."

A Word about Antiseptics

Agents that kill germs on living tissue and skin are known as antiseptics. Examples of antiseptics include alcohol in mouthwashes and chlorhexidine, and other anti-microbial agents in products designed to prepare skin surfaces for surgery or administering intravenous fluid. CDC notes that antiseptics generally are not used on environmental surfaces. By the same token, sanitizers, disinfectants and sterilants are not used as antiseptics because they can injure the skin and other tissues.

We hope this short article is a helpful resource in clarifying the terms of germ inactivation.