

# Chapter 7

## Control of Microorganisms by Physical and Chemical Agents

# Definition of Frequently Used Terms

- sterilization
  - destruction or removal of all viable organisms
- disinfection
  - killing, inhibition, or removal of pathogenic organisms
  - disinfectants
    - agents, usually chemical, used for disinfection
    - usually used on inanimate objects

# More definitions...

- sanitization
  - reduction of microbial population to levels deemed safe (based on public health standards)
- antiseptics
  - prevention of infection of living tissue by microorganisms
  - antiseptics
    - chemical agents that kill or inhibit growth of microorganisms when applied to tissue

# Antimicrobial agents

- agents that kill microorganisms or inhibit their growth
- -cidal agents kill
- -static agents inhibit growth

# -cidal agents

## -cide

- suffix indicating that agent kills

- germicide

- kills pathogens and many nonpathogens but not necessarily endospores

- include bactericides, fungicides, algicides, and viricides

# -static agents

## -static

- suffix indicating that agent inhibits growth
- include bacteriostatic and fungistatic

# The Pattern of Microbial Death

- microorganisms are not killed instantly
- population death usually occurs exponentially
- microorganisms are considered to be dead when they are unable to reproduce in conditions that normally support their reproduction

# Conditions Influencing the Effectiveness of Antimicrobial Agent Activity

- population size
  - larger populations take longer to kill than smaller populations
- population composition
  - microorganisms differ markedly in their sensitivity to antimicrobial agents



# More conditions...

- concentration or intensity of an antimicrobial agent
  - usually higher concentrations or intensities kill more rapidly
  - relationship is not linear
- duration of exposure
  - longer exposure  $\Rightarrow$  more organisms killed

# More conditions...

- temperature
  - higher temperatures usually increase amount of killing
- local environment
  - many factors (e.g., pH, viscosity and concentration of organic matter) can profoundly impact effectiveness