

CHAPTER 18 CONTROL OF MICROBIAL GROWTH WITH DISINFECTANTS AND ANTISEPTICS

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TARGETS FOR DISINFECTANTS AND ANTISEPTICS

- ◆ The cell wall, plasma membrane, proteins, and nucleic acids of microbes are targets for disinfectants and antiseptics

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MICROBIAL DEATH

- ◆ The permanent loss of reproductive capability has become the accepted definition of microbial death
- ◆ Several factors can affect the rate of death, including the number of organisms, the duration of exposure, temperature, environment, and the ability to form a spore

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CHEMICAL METHODS FOR CONTROLLING MICROBIAL GROWTH

- ◆ The potency of disinfectants and antiseptics can be affected by time, temperature, and concentration
- ◆ The effects of disinfectants and antiseptics can be increased by increasing the temperature

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DISINFECTANTS AND ANTISEPTICS

- ◆ Three tests — phenol coefficient test, disk diffusion method, and use dilution — are used to evaluate disinfectants and antiseptics
- ◆ There are eight major categories of chemical agents used as antiseptics and/or disinfectants: phenols, alcohols, halogens, oxidizing agents, surfactants, heavy metals, aldehydes, and gases

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PHYSICAL METHODS FOR CONTROLLING MICROBIAL GROWTH

- ◆ Physical methods for controlling microbial growth include heat, cold, desiccation, filtration, osmotic pressure, and radiation
- ◆ High temperature usually results in the death of microbes

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PHYSICAL METHODS FOR CONTROLLING MICROBIAL GROWTH

- ◆ Thermal death time is the shortest time needed to kill all organisms at a specific temperature
- ◆ Thermal death point is the lowest temperature required to kill all organisms in 10 minutes
- ◆ Autoclaves combine temperature and pressure for sterilization

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PHYSICAL METHODS FOR CONTROLLING MICROBIAL GROWTH

- ◆ Ionizing radiation sterilizes without heat or chemicals and is used on some foods as well as medical products
- ◆ Ultraviolet irradiation is used for disinfection but not for sterilization

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