Glossary

- __________________: An agent or substance capable of destroying or inhibiting the growth of microorganisms
- __________________: The complete absence of microbial contamination or infection
- __________________: Chemical or physical agent that is used to destroy bacteria

- __________________: Chemical or physical agent that is used to inhibit or retard the growth of bacteria
- __________________: The process of soiling with infectious material
- __________________: Removal or neutralization of a contaminant by a chemical or physical agent
Glossary

• __________________: To alter or change from normal any of a subject’s characteristics, usually applies to proteins or nucleic acids

• __________________: A chemical or physical agent that possesses the ability to destroy or inhibit micro-organisms. Does not apply to bacterial spores

• __________________: Chemical or physical agent that is capable of destroying fungi

Glossary

• __________________: A chemical or physical agent capable of destroying all types of microorganisms

• __________________: A chemical or physical agent that will reduce the total bacterial contamination to safe levels as established by the Public Health Department

• __________________: Any chemical or physical agent capable of destroying vegetative spores

Glossary

• __________________: Free of all microorganisms

• __________________: The act or process of destroying all microorganisms including spores
Techniques

Pasteurization

• Description
  – Brings about the destruction of most microorganisms (except spores) by immersion of equipment in a hot (170°F) for ________ minutes
  – The microorganisms are killed by coagulation of cell protein

• Objective
  – To kill microorganisms present on equipment that can tolerate immersion in a liquid and high temperatures

Pasteurization

• Procedure
  – Disassemble equipment to be cleaned
  – Set aside parts that cannot be immersed
  – Clean equipment of all organic material
  – Place in pasteurizing water bath
  – Immerse for one hour
  – Remove from water bath; dry completely
  – Place in plastic bag; seal
  – Mark bag with date, expiration date and your initials
  – Store in clean area
Pasteurization

• Special Considerations
  – Equipment must be clean prior to immersion
  – Possible recontamination may occur during processing - handle aseptically
  – Equipment must be completely _________ before repackaging
  – Periodic microbiological sampling to verify effectiveness of process

Pasteurization

• Hazards
  – __________ during processing
  – Recontamination following removal from pasteurizer

• Maintenance
  – Shelf life of _________ months

Glutaraldehydes

• Most common chemical
  • Alkaline or Acid

• Objective
  – To kill all microorganisms present on equipment that can tolerate immersion in a liquid at room temperature or above
Glutaraldehydes - Alkaline

- Activated with a bicarbonate solution, yielding a solution with a pH of ________
- Bactericidal, fungicidal, tuberculocidal, and virucidal with an exposure time of _____ minutes
- Sporicidal with an exposure time of ________ hours
- Requires immersion of equipment in sterilization liquid
- Microorganisms are killed by interference with protein synthesis

Glutaraldehydes - Acid

- pH of 2.7 to 3.7
- Bactericidal, virucidal, and fungicidal in ________ minutes, tuberculocidal in ________ minutes
- Activity can be enhanced by warming it to 60°C (140°F)
  - bactericidal, fungicidal, and virucidal in ________ minutes
  - tuberculocidal in ________ minutes
  - sporicidal in ________ minutes

Cold Chemical

- Procedure
  - ________ equipment to be cleaned
  - Set aside parts that cannot be immersed
  - Clean equipment of all organic material
  - ________ thoroughly to remove cleaning residue
Cold Chemical

• **Procedure**
  – Remove excess water
  – Immerse equipment completely in sterilizing liquid for the required length of time
  – Remove from liquid
  – Rinse thoroughly with sterile water
  – Dry completely in clean area
  – Reassemble in desired configuration
  – Place in plastic bag; seal
  – Mark bag with date, expiration date and your initials
  – Store in clean area

• **Special Considerations**
  – Equipment must be __________ prior to immersion
  – Must be completely immersed; all surface areas must be in contact with liquid
  – Use gloves to avoid contact dermatitis
  – Rinse thoroughly to remove toxic residues
  – Possible recontamination may occur during processing - handle aseptically
  – Equipment must be completely __________ before repackaging
  – Periodic microbiological sampling to verify effectiveness of process

• **Hazards**
  – Contact dermatitis
  – Recontamination
  – Toxic effects to patient if equipment is inadequately rinsed

• **Maintenance**
  – Shelf life is _____ months
Ethylene Oxide

• Description
  – Brings about the destruction of microorganisms by the use of Ethylene Oxide (ETO) gas at a certain RH (______%), temp. (______°F), concentration (______%), vacuum (______ inches) and time (______ hrs)
  – The microorganisms are killed by preventing their reproduction

• Objective
  – To kill all microorganisms present on equipment that is heat or moisture sensitive

Ethylene Oxide

• Procedure
  – Disassemble equipment to be cleaned
  – Clean equipment of all organic material
  – Rinse equipment thoroughly to remove all cleaning residue
  – Dry equipment completely
  – Reassemble equipment in desired configuration.
  – Place equipment in plastic bag and insert indicator strip

Ethylene Oxide

• Procedure
  – Remove as much air as possible from bag and seal with heat sealer, twist tie or tape
  – Place ETO tape on bag and mark package with date, expiration date, and your initials
  – Stack packages in ETO chamber
  – Follow manufacturer’s instructions for ETO cycle
  – When cycle is complete, remove from chamber and aerate either on shelf or in aeration chamber
  – Store in clean area
Ethylene Oxide

- **Special Considerations**
  - Equipment must be clean and dry before packaging
  - Complete aeration must be assured: _______ week on shelf or _______ hrs. in aeration chamber
  - Plastic bags must be permeable to ETO
  - All sterilizing parameters must be met
  - Periodic microbiological sampling to verify effectiveness of process

- **Hazards**
  - If equipment is not dry, water combines with ETO to form the toxic by-product ethylene glycol
  - Because of this, skin irritation, laryngeal edema, swelling and burns may occur with improperly processed or aerated equipment

- **Maintenance**
  - Shelf life for a tied or taped plastic package is _______ months; for a heat-sealed plastic package, it is _______ year

Steam Autoclave

- **Description**
  - Brings about the destruction of microorganisms by the use of steam under high temperature and pressure
  - The microorganisms are killed by disruption of the cell membrane or coagulation of cell protein

- **Objective**
  - To kill all microorganisms present on equipment that can tolerate moisture and high temperature
Steam Autoclave

- Procedure
  - Disassemble equipment to be cleaned
  - Clean equipment of all organic material
  - Rinse thoroughly to remove cleaning residue
  - Reassemble in desired configuration
  - Wrap in porous towel or wrap; include indicator strip
  - Close wrap with indicator tape
  - Wrap again or place in plastic/paper pouch (p/pp)

Steam Autoclave

- Procedure
  - Close with indicator tape or heat seal the p/pp; mark package with date, expiration date and your initials
  - Stack packages in steam autoclave
  - Follow manufacturer’s instructions for steam cycle
  - When cycle is complete, carefully remove from chamber
  - Store in clean area

Steam Autoclave

- Special Considerations
  - Electrical equipment can be harmed with this procedure
  - Plastics will most likely ______________
  - After processing, pack must remain dry to ensure sterility
  - Periodic microbiological sampling to verify effectiveness of process
# Steam Autoclave

- **Hazards**
  - Burns may occur with careless handling of packs
- **Maintenance**
  - Shelf life is
    - ________ days for cloth wrap
    - ________ days for paper wrap
    - ________ days for p/pe

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# Dry Heat

- **Description**
  - Brings about the destruction of microorganisms by high temperature over a long period of time (_______ hrs.)
  - The microorganisms are killed by disruption of the cell membrane or protein coagulation
- **Objective**
  - To kill all microorganisms present on equipment that can tolerate high temperature, but not moisture

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# Dry Heat

- **Procedure**
  - Disassemble equipment to be cleaned
  - Clean equipment of all organic material
  - Rinse equipment thoroughly to remove all cleaning residue
  - Reassemble equipment in desired configuration
  - Wrap equipment in porous towel or wrap
  - Close wrap with indicator tape
Dry Heat

- **Procedure**
  - Wrap again with second towel or wrap, or place in a paper/plastic pouch (p/pp)
  - Close wrap with indicator tape or heat seal p/pp and mark with date, expiration date and your initials
  - Stack packages in autoclave chamber
  - Follow manufacturer’s instructions for dry heat cycle
  - When cycle is complete, remove from chamber
  - Store in clean area

- **Special Considerations**
  - Use where steam is unavailable
  - Plastics will most likely melt
  - Do not use on electrical equipment
  - After processing, pack must remain dry to ensure sterility
  - Periodic microbiological sampling to verify effectiveness of process

- **Hazards**
  - Burns may occur with careless handling of packages

- **Maintenance**
  - Shelf life for
    - cloth or paper is _______ days
    - ___________ days for p/pp
Acetic Acid

- **Description**
  - Technique most often recommended to patients with respiratory therapy equipment
  - Requires immersion in a weak acetic acid solution

- **Objective**
  - To decontaminate home care equipment for the respiratory therapy patient

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Acetic Acid

- **Procedure**
  - Disassemble equipment to be cleaned
  - Clean of all organic material
  - Rinse thoroughly to remove cleaning residue
  - Immerse completely in acetic acid solution (1:3 white vinegar and water)
  - Let soak at least 20 minutes
  - Remove from solution

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Acetic Acid

- **Procedure**
  - Rinse thoroughly; remove any water from tubing
  - Drain/dry completely in clean area
  - Reassemble in desired configuration
  - Place in plastic bag; seal
  - Store in clean area
Acetic Acid

• Special Considerations
  – Should be used only for home care patients
  – Should be performed at the end of each day of therapy
  – Possible recontamination may occur during processing - handle aseptically
  – Monitor patient infection rate
    • Rule out equipment as source of infections

Acetic Acid

• Hazards
  – Recontamination
  – Lacks effectiveness against many __________

• Maintenance
  – New solution should be used each day
  – Process equipment each day
  – Shelf life of _______ day

Surveillance

• Ongoing surveillance is required to ensure that an infection control program is providing adequate protection for patients and health care providers

• Typically consists of three components:
  – monitoring of equipment processing procedures
  – routine sampling of in-use equipment
  – identifying suspected pathogens microbiologically
### Surveillance

- Equipment processing is monitored using biologic indicators
  - _________________________

- In-use equipment can be routinely sampled:
  - sterile cotton swabs → used to obtain samples from easily accessible surfaces of RC equipment
  - liquid broth → used to obtain samples when cotton swabs cannot reach many parts of the equipment
  - aerosol impaction → used to sample the particulate output of nebulizers