



# Community Dentistry Third class

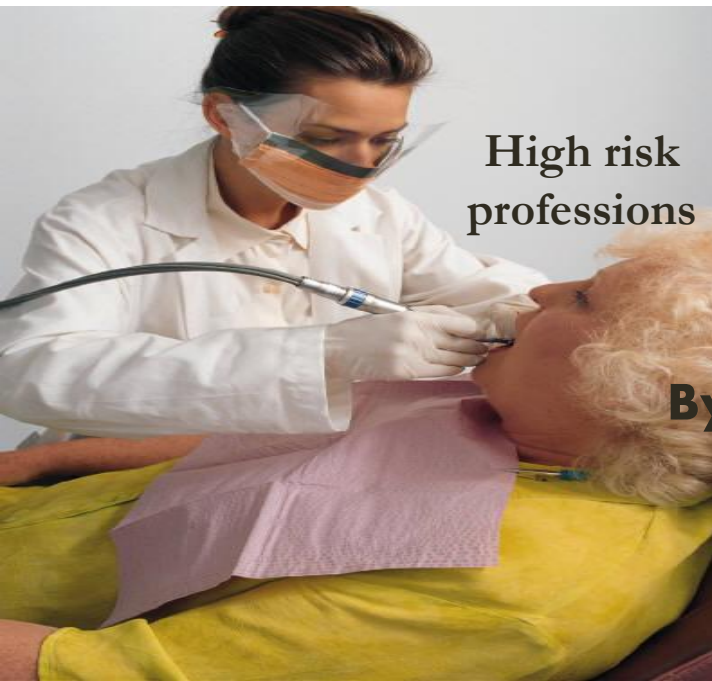
## Infection Control in Dental Practice

### Part 2

### lecture

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High risk  
professions

# Objectives

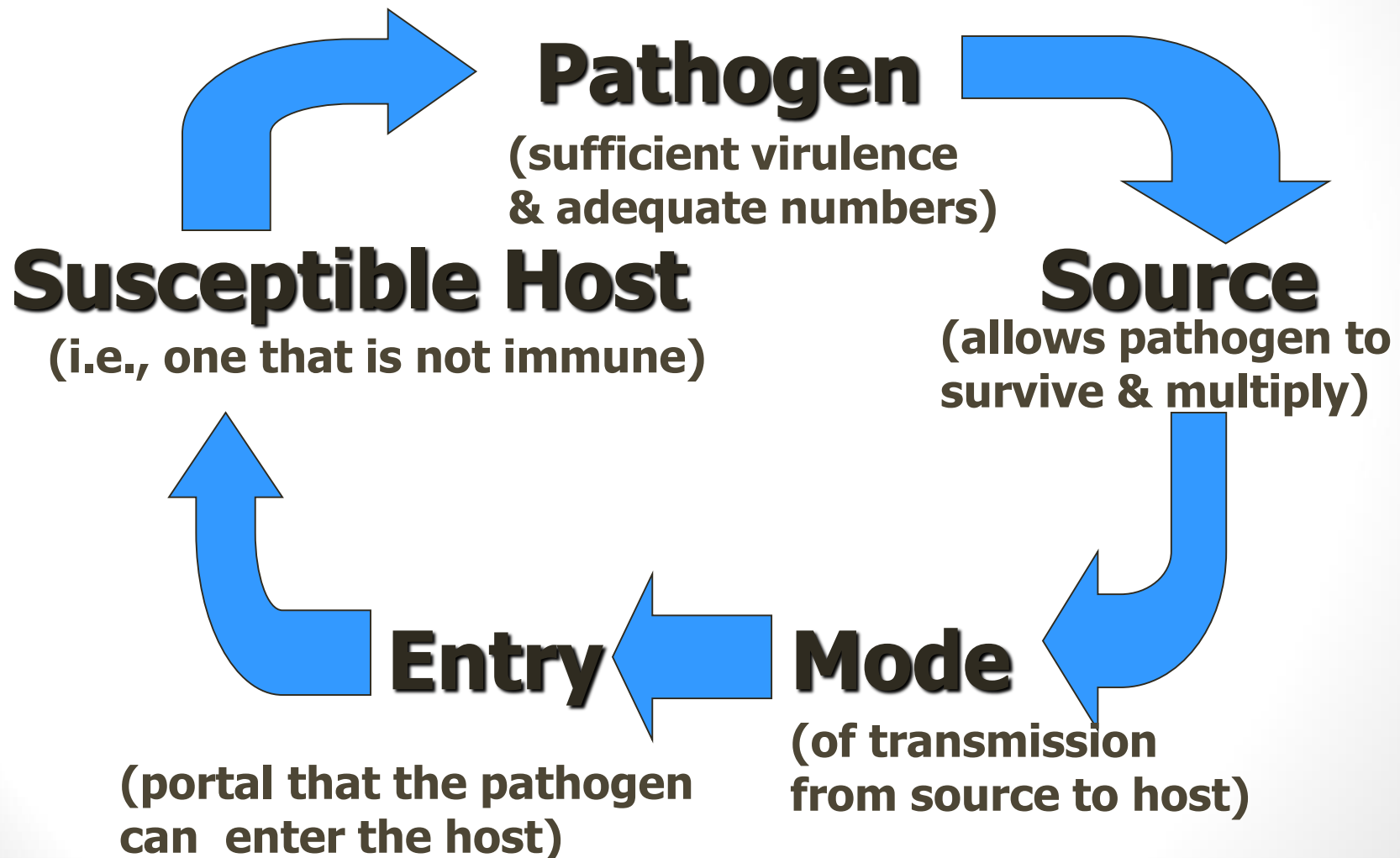
- methods of decontamination
- Type of sterilization
- Chemical disinfectants

# Methods of decontamination

- sanitization
- Disinfection
- Sterilization
- Asepsis

# CHAIN OF INFECTION

- All links must be connected for infection to take place



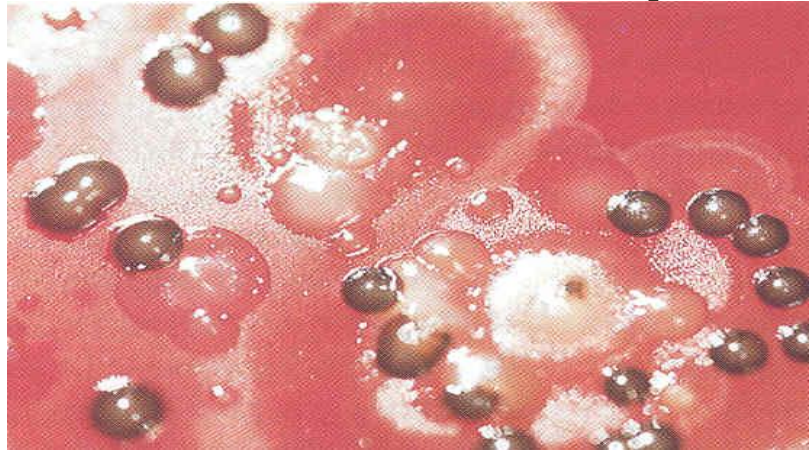
# Sanitization

This is the first level of decontamination. This is a process of physical cleaning to remove organic debris in order that disinfection can occur. It is done by cleaning the surface with soap and water or with detergent.

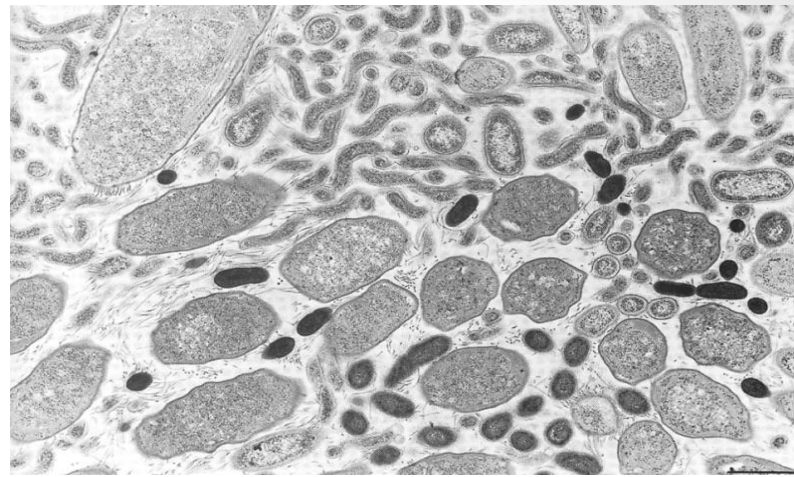
# Disinfection

This is next level of decontamination.

Destruction or inhibition of the most pathogenic MO in their non-sporing state (vegetation), fungi. This use chemical germicides, radiation, ultraviolet rays or heat. Disinfection cannot occur in presence of organic debris.



# Sterilization



This is third level. Sterilization kills all bacteria, fungi, virus and bacterial endospores. It uses chemical and physical methods



# Asepsis

A method of surgery which is designed to prevent the introduction of infection into a wound during surgery or wound dressing





# Sterilization vs. disinfection:

Sterilization is a process that leads to a status of an absolute freedom from variable forms of microorganisms. On the other hand, disinfection stands for the process of prevention of the multiplication of organisms and reduction in the level of contamination.

# Antiseptics vs. Disinfectant:

Both terms refers to substances that are used to reduce the level of contamination. The only difference is that antiseptics are applied to living tissues (e.g. skin) and disinfectants are restricted to be used on inanimate objects (e.g. instruments, dental chair).

# General Guidelines

## Before procedures:

- Hands must be cleansed: (soap + water)/(surgical scrub) & wear clean/sterile gloves
- Instruments must be sterilized
- Before sterilization, instruments must be **CLEANED** from debris and blood deposits

## Handwashing Steps



- 

1  
Wet hands and apply enough soap
- 

2  
Rub palms together
- 

3  
Place right palm over the dorsum of left palm
- 

4  
Rub palms together with fingers interlaced
- 

5  
Rub the back of fingers to opposite palm
- 

6  
Clasp the opposite thumb with the other hand
- 

7  
Rinse off hands with water

- Sterilization of Disposable Items

- Gamma irradiated
- Reliable manufacturer and unbroken rapping
- Suitable for scalpel blades and sutures

# Methods for instruments sterilization:

These can be generally classified into either physical or chemical methods. Physical methods involve the use of heat for sterilization and this can be either as dry heat (e.g. ovens) or moist heat (e.g. autoclave). While chemical methods include sterilization by gas (e.g. ethylene oxide) and other substances.

# 1. Physical method

## Autoclaving (moist heat) sterilization

- Boiling water alone is INSUFFICIENT to kill spores and viruses
- This method of sterilization is more efficient than dry heat at much lower temperature, as the water can conduct heat better than air. Pressure serves as the mean to obtain high temperature to kill M.O.
- Effective autoclaving: Temperature = 121- 132°C, Pressure= 32 (Psi), Time =3- 20 minutes depending on the type.
- If instrument will not be used immediately, must have a drying phase
- Autoclaving may reduce sharpness of instruments and promote rusting



**Autoclave**

Moist hot air and pressure



# Dry heat sterilization

This is the most common method for sterilization, although not the most efficient, in dental offices.

- Takes place in a “Hot Air Oven”
- Suitable for instruments with a sharp cutting edge
- For effective heat sterilization: Temperature = 170° C, Time = 1 hours, or 2 hours at 160°



hot air oven

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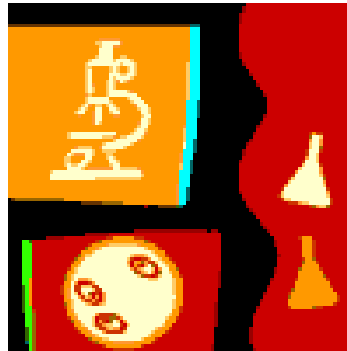
## 2. Sterilization with Gas

This method can be used for sterilization of heat sensitive equipment (i.e. Plastic). However large equipment is needed and the used gas (i.e. Ethylene oxide) is highly toxic and requires considerable time for the instruments to be aerated to minimize tissue toxicity. The total time of sterilization and aeration might reach between 15 hours and up to several days. Therefore its use in dentistry is limited.

# Chemical disinfection

- Suitable for working surfaces & instruments
- Limitations:
  - The object to be disinfected must be thoroughly cleaned
  - Efficient at certain Concentration & Temperature
  - Each agent needs a certain minimum exposure time
  - Certain chemical may damage certain surfaces

# Chemical Disinfectants



Alcohols, Aldehydes, Biguanides, Halogens,  
Phenolics, Quaternary Ammonium Compounds,

# Alcohols

- Isopropyl alcohol & 70% ethyl alcohol
  - Effective against Gram negative (*G-ve*) bacteria on clean surfaces
  - Not active against fungi
  - Suitable for skin preparation before venepuncture



# Aldehydes

Glutaraldehyde (Cidex®), & Formaldehyde (formalin)

- Active against G-ve bact., spores, viruses (HB, HIV) & fungi
- Requires three hours of exposure
- Suitable for non-autoclavable instruments
- Blood/saliva spillages



# Biguanides

- Chlorhexidine
- Active against Staph. aureus & some G-Ve bacteria
- Not active against fungi or viruses
- Inactivated by soap and pus
- Used for cleaning skin and mucous membranes e.g.:
  - Savlon®: 0.5%CHX + cetrimide
  - Hibiscrub®: 4%CHX + detergent
  - Hexana®, Corsodyl® =0.2% CHX

# Halogens I

Sodium hypochlorite, 10000 ppm  
of available chlorine

- Active against bacteria, spore, fungi and viruses (HB, HIV)
- At least 20 minutes of exposure time
- Inactivated by blood, pus and dilution

# Halogens II

- Iodophors & iodine
  - Active against bacteria, spores & some viruses & fungi
  - Can be inactivated by pus and blood
- Suitable for skin preparation, mouthwash & as a surgical scrub (7.5% Povidone-iodine= Betadine)

# Phenolics

## Hexachlorophane

- Active against staph aureus, limited activity against G-ve bacilli
- Used as a surgical scrub (Phisomed®)

# Quaternary Ammonium Compounds

Cetrimide (+0.5%CHX= Savlon®)

- Active against staph aureus
- Easily inactivated by water and soap
- Can be contaminated by pseudomonas

