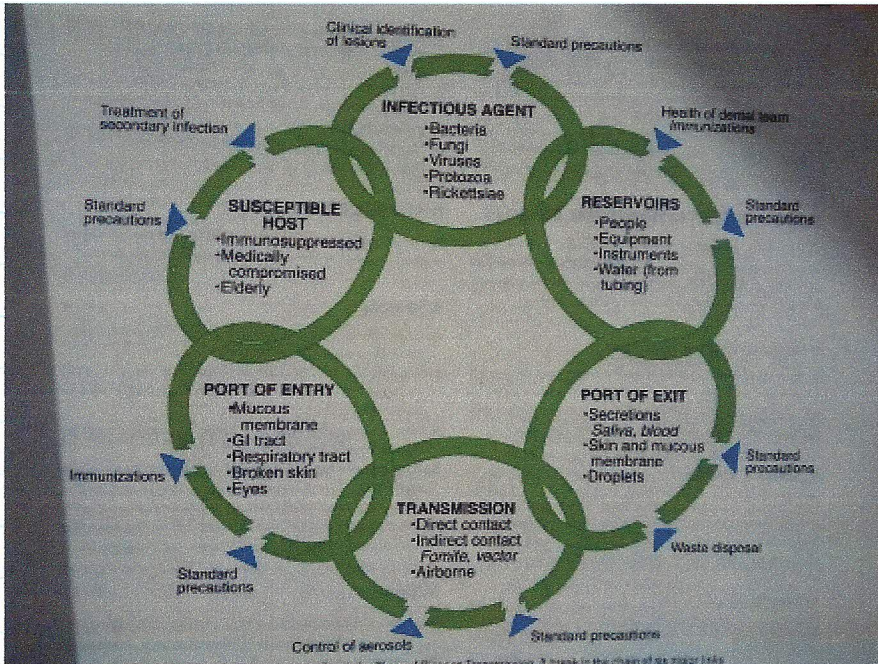


INFECTION CONTROL: TRANSMISSIBLE DISEASES

Simple oral flora develops within in a few hours after birth.

Much salivary bacteria come from the dorsum of the tongue, but some are from mucous membranes and gingival/periodontal tissues.



***Aerosols are**
Less than 50µm in diameter and nearly all
are less than 5µm
Aerosols less than 5µm may be breathed
deep into the lungs

ESSENTIAL FEATURES FOR DISEASE TRANSMISSION

- An *infectious agent*. The invading organism.
- A *reservoir* where the invading agent live and multiply.
- A *port of exit* or mode of escape from the reservoir. Organisms exit through various body systems such as the respiratory tract or through skin lesions.
- A *mode of transmission* which may be direct, person to person, or indirect via a vehicle (needle, droplet etc)
- The *port of entry* into the new host. These are usually similar to the port of exit
- A *susceptible host* that does not have immunity to the invading agent.

Factors Impacting Infections

- Number of organisms
- Duration of exposure
- Virulence
- Immune status of host
- General physical health and nutrition of host

Factors that Alter Normal Defense

- Abnormal Physical Condition
- Systemic Diseases
- Drug Therapy
- Prostheses and Transplants

Transmission Prevention

- a. Preprocedural Oral Hygiene
 - a. Brushing and Flossing
 - b. Mouthrinse

- b. Interruption of Transmission
 - a. Use rubber dam, and manual instrumentation often as possible
 - b. Install air control methods and have good ventilation
 - c. Employ vacuum cleaning to remove dirt and microorganisms
- c. Clean Water
 - a. Use EPA regulatory water (>500 CFU/ml of heterotrophic bacteria)
 - b. Run water through all connected devices for at least 2 minutes at Beginning of day or 30 seconds between patients.
- d. Protection of Clinician
 - a. Use masks, shields, gloves, and eyewear
- e. Protection of Patient
 - a. Use eyewear

TB

-Contracted by inhaling fresh droplets with tubercle bacilli. Transmission depends on how many infected droplets were taken, duration of exposure, and susceptibility of recipient. Infection can be swallowed or inhaled.

It takes up to 10 weeks to incubate.

Early symptoms may be fever, loss of appetite, low energy. A slight cough and sputum will follow.

Symptoms will increase. Diagnosis is by chest radiograph and tuberculin testing.

HEPATITIS A

Most common hepatitis. Transmits via fecal oral, waterborne, food borne, and blood. Incubation is 15-50 days with an average of 30 days. Jaundice and icteric. Preicteric phase will have an influenza like illness. Icteric phase will have possible jaundice in adults.

HEP B

Incidence has increased in the past 20 years. Nearly all bodily fluids carry the virus but only blood, saliva, semen, and vaginal fluids are infectious.

It is transmitted by percutaneous and permucosal exposure.

Needle sticks, prenatal exposure and sexual exposure are examples. Pregnant women can be tested for the virus.

Incubation period ranges 2-6 months. Symptoms will include fever, malaise and flu like symptoms. Afterwards it is likely that a carrier will develop cirrhosis or cancer of the liver.

HEP C

Hepatitis C is the most common chronic blood-borne infection in the United States and the most frequent indication for liver transplantation. It is acquired by percutaneous exposure to blood and plasma. It is demonstrated in saliva. Sexual and prenatal exposure is possible too.

Symptoms include nausea, vomiting and can progress to jaundice. After acute infection 50-80%. The course of chronic liver disease is insidious as a person can be symptom free with progression for 20 while infected.

Herpes Virus

Can be latent, recurrent and sometimes malignant. There are 8 different types of Herpes (HHV1-HHV8),

PATHOGENS

- Tuberculosis
 - BCG Vaccine
- Hepatitis
 - A- Vaccine
 - B- Vaccine
 - C - No vaccine
- AIDS
- Herpes
- Diphtheria
 - Vaccine
- Mumps
 - Vaccine
- Influenza A,B,C
 - Vaccines
- Rubella (German Measles)
 - Vaccine
- Streptococcal pyrogenes
 - NO vaccine
- Staphylococcus aureus
 - NO vaccine
- Streptococcus pneumonia
 - Vaccine

Wilkins Chapter 3

Tuesday, September 23, 2014 10:24 AM

EXPOSURE CONTROL: BARRIERS for PATIENT AND CLINICIAN

1. Immunizations

- a. Tetanus and Diphtheria
- b. Influenza
- c. Pneumococcal
- d. Hepatitis B
- e. Hepatitis A
- f. Measles Mumps, Rubella
- g. Varicella
- h. Meningococcal

2. Management Program

- a. Annual tuberculin test
- b. Periodic throat culture for hemolytic streptococcus

3. Clinical Attire

- a. Gown or Uniform
- b. Hair and head covering

4. Face Mask and Respiratory Protection

- a. Face mask
 - i. Filtration
 - ii. Fit
 - iii. Moisture Absorption
 - iv. Comfort
- b. Eyewear
 - i. Goggles
 - ii. Side shields
 - iii. Curved frames
- c. Gloves

Handwashing Methods

- **Routine Handwashing**
 - Water and plain soap
 - Removes soil and transient microorganisms
- **Antiseptic Handwash**
 - Water and antimicrobial liquid soap (chlorhexidine, iodine, triclosan)
 - Remove transient microorganisms and reduce flora
- **Antiseptic Hand Rub**
 - Alcohol-based hand rub (60-95% ethanol or isopropanol)
- **Surgical Antisepsis**
 - Water and antimicrobial liquid soap
 - Removes and destroys transient microorganisms and reduces resident flora with a persistent or prolonged effect that inhibits proliferation or survival of microorganisms

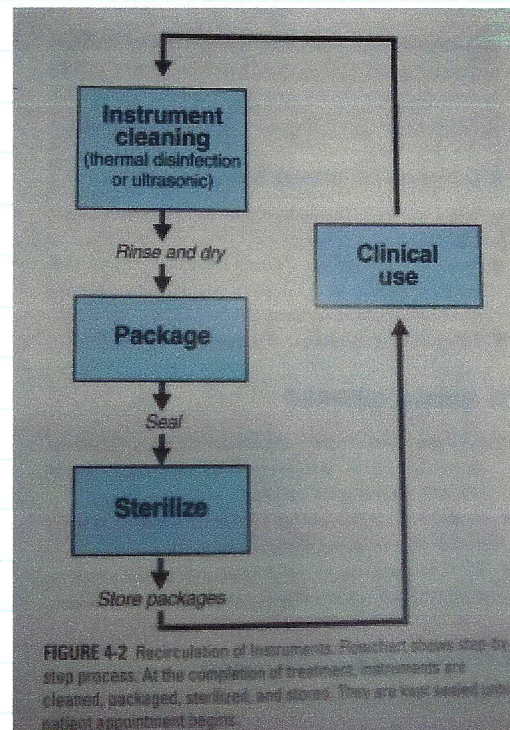
INFECTION CONTROL: CLINICAL PROCEDURES

Objectives of Infection Control

- Reduction of available pathogenic microorganisms to a level at which the normal resistance mechanisms of the body may prevent infection
- Eliminate cross-contamination by breaking the chain of infection
- Application of standard precautions by treating each patient as if all human blood and body fluids are known to be infectious for HIV, HBV, HCV and other blood-borne pathogens.

Basic Considerations for Safe Practice

- Treatment Room Features
 - Easy cleaning and disinfection
 - Removable hoses
 - Syringes with autoclavable tips with disposable tips
 - Handpieces that can be autoclaved
 - Foot operated controls
 - Foot activated switches
 - No cloth carpeting
 - Stainless steel sink
 - Sterilizable or disposable supplies
 - Sharps and biohazard disposal
 - Instrument Processing Center
 - Cleaning Procedure
 - Instrument Washer & Thermal Disinfectant
 - Ultrasonic Processing
 - Manual Cleaning
 - Packaging
 - Sterilization
 - Moist heat - steam under pressure
 - Dry Heat
 - Chemical Vapor
 - **TESTS FOR STERILIZATION**
 - External Chemical Indicator
 - Internal Chemical Indicator
 - Biologic Monitor
 - ⊗ Steam autoclave - *Geobacillus stearothermophilus*. Vials, strips or ampules
 - ⊗ Dry Heat - *Bacillus atrophaeus* strips
 - ⊗ Chemical Vapor - *Geobacillus/stearothermophilus* strips
 - **Do at least weekly more often when heavy autoclave use**
- Chemical Vapor Sterilizer
- Care of Sterile Instruments
- Chemical Disinfectants
 - *See chemical list below
- Chemical Sterilants (Immersion)
 - Only for items that cannot be sterilized by heat
 - Time range from 10-30min to 10hours



- Cannot package instruments
- Treatment Room Prep
- Patient Preparation
 - Toothbrushing
 - Rinsing
- Disposal of Waste

Dry Heat

The action of dry heat is oxidation.

Use primarily for materials that cannot safely be sterilized with steam under pressure, for oil and powders when they are thermostabile at required temperatures, and for small metal instruments enclosed in special containers or that may be corroded or rusted by moisture.

- A. Sterilization is achieved by heat that is conducted from the exterior surface to the interior of the object. Time varies by material
- B. Sterilization can result when the whole material is treated for a sufficient length of time at required temperature.
- C. Oil, grease, or organic debris on instruments can insulate and protect microorganisms from sterilizing.

Temperature of 160C or 320F

Temperatures over 160C/320F may destroy the sharp edges of cutting instruments.

Advantages: Useful for materials that cannot be subjected to steam under pressure. At proper temperature, it is well suited for sharp instruments. No corrosion.

Disadvantages: Long exposure time is required, penetration is slow and uneven. High temperature is critical to certain materials.

CRITERIA FOR SELECTION OF CHEMICAL AGENT

- EPA approval
- Chemicals must be **tuberculocidal, bacteriocidal, virucidal, and fungicidal**
- Label must state
 - Shelf life
 - Use life
 - Reuse life
 - Directions for activation
 - Type of storage
 - Directions for use
 - Precleaning and drying
 - Time and Temp
 - Instructions for disposal
 - Warnings
 - Toxic Effects
 - Specific directions for emergencies

Moist Heat

Can be used for all materials except oils, waxes and powders that are impervious to steam or for materials that cannot be subjected to high temperatures.

-Air must be excluded

-Space between objects

-Materials must be cleaned and air dried

- 1) Temperature must remain at 121 C or 250F at 15pounds pressure for 15 minutes. Use 30 minutes for heavy loads.
- 2) Dry Materials. Release steam pressure and open door. Required time is for drying is 15 minutes.
- 3) Liquids. Reduce chamber slowly at an even rate over 10-12 minutes to prevent boiling or escape of fluids into the chamber.

DAILY: Maintain proper level of distilled water, wash trays and interior surfaces of chamber with water and detergent, clean removable plug, screen or strainer

WEEKLY: Flush chamber discharge system with an appropriate cleaning solution such as hot trisodium phosphate or commercial cleaner

Advantages: All microorganisms, spores and viruses are destroyed quickly and efficiently. Can be used on a wide variety of materials and is economical

Disadvantages: May corrode carbon steel and is unsuitable for oils or powders.

Chemical Vapor Sterilizer

A combination of alcohols, formaldehyde, ketone, water and acetone heated under pressure produces a gas effective to sterilize.

Cannot be used for materials or objects that can be altered by the chemicals or that cannot withstand the high temperature. IE// Low-melting plastics, liquids, or heat sensitive handpieces.

-Microbial and viral destruction results from permeation of heated formaldehyde and alcohol

-Heavy, tightly wrapped, or sealed packages would not permit the penetration of vapors

Temperature: 127-132C (260-270F) with 20 to 40 pounds of pressure

Time: Minimum of 20 minutes after the correct temperature and pressure have been attained. Extend for large load or heavy wrap. Let instruments cool for a short period afterward.

Advantages: Corrosion and rust free for carbon instruments. Ability to sterilize in short cycle. Ease of operation.

Disadvantages: Adequate ventilation is needed; cannot use in a small room. Slight odor.

EXPOSURE

1. Immediately wash the wound with soap and water and rinse well
2. Flush nose, mouth, eyes or skin with clear water, saline or sterile irrigant
3. Report to designated official
4. Complete and incident report as required
5. Follow the required predetermined posted procedures
6. Postexposure policies must follow most recent guidelines provided by **United States Public Health Service**

TYPES OF CHEMICAL DISINFECTANTS

1. Gluteraldehydes
 - a. HIGH LEVEL
 - b. Use gloves, eyewear, forceps
2. CHLORINE COMPOUNDS
3. IODOPHORS
 - a. 1 part iodophor:213 soft or distilled water
4. COMBINATION PHENOLICS (synthetic)
 - a. Water based or alcohol based