DISINFECTION AND STERILIZATION

PRELIMINARY CONSIDERATIONS FOR OPERATIVE DENTISTRY

PAIN MANAGEMENT

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A. Environment of the dental operatory

1. Air-borne contamination
2. Direct contamination
3. Indirect contamination
4. Cross-infections
5. Patient vulnerability - low risk *(patient to dentist)*
6. Personnel vulnerability *(immunizations + protective barriers)*

1. **Air-borne contamination** - high-speed handpiece contaminants:
   - bacterial residents in the dental unit water spray system
   - microbial contaminants from saliva, tissues, blood, plaque, and fine debris
   - exist in the form of spatter, mists, and aerosols
   - **Aerosols** - invisible particles *(50 mm - to ~ 5 mm)* suspended in the air ± agents of any respiratory infection
   - **Mist** - visible in a beam of light ± consists of droplets *(≥ 50 mm)*
   - **Spatter** - particles > 50 mm ± visible splashes coat face and outer garments of personnel

potential route of infection for dental personnel *(blood-borne pathogens)*
EXPOSURE RISKS AND EFFECT OF INFECTIONS ON DENTISTRY

2. Direct Contamination - in direct contact with body fluids → major exposure concern for dental personnel

3. Indirect Contamination:
   - saliva-contaminated hands (of hygienist, dentist, assistant) → repeatedly contacted or handled unprotected operatory surfaces
   - soiled, poorly cleaned surfaces → patient’s cross-contamination

4. Cross-infections - transmission of infectious agents among patients and staff within a clinical environment.

ROUTES OF SPREAD OF INFECTION:

- Patient to dental health care worker
- Dental health care worker to patient
- Patient to patient
- Dental office to community
- Community to patient
• Patient to dental health care worker:
  - direct contact (*impaired skin / mucous integrity*)
  - indirect contact (*via sharp cutting instruments / needle stick injuries*)
  - droplet injection (*by spatter*)

**SOURCE OF INFECTION** can be:
- Patients suffering from infectious diseases
- Patients who are in the prodromal stage of infections
- Healthy carriers of pathogens
• **Dental health care worker to patient:**
  - direct contact
  - indirect contact \((use\ of\ contaminated\ instruments\ ±\ lack\ of\ use\ of\ disposable\ instruments)\)
  - droplet infection \((inhalation\ by\ the\ patient)\)

• **Patient to patient** - use of contaminated and non-disposable instruments

• **Dental Office to the Community:**
  - contamination of dental laboratory technicians - by contaminated impression or other equipments
  - spoiled clothing and regulated waste

• **Community to the Patient** - entrance of MO into water supply of dental unit
EXPOSURE RISKS AND EFFECT OF INFECTIONS ON DENTISTRY

CROSS-INFECTIONS

Portal of exit
- secretions
- excretions
- droplets
- skin

Reservoir
- people
- equipment
- water

Causative agent
- bacteria
- viruses
- fungi
- protozoa
- helminthes

Mode of transmission
- direct
- indirect
- contact/vomite
- injection/ingestion
- airborne/aerosols

Portal of entry
- broken skin/mucous membrane
- gastrointestinal/respiratory/urinary tract

Susceptible host
- neonates
- diabetics
- immunosuppressed
- cardiopulmonary disease

Chain of infection

Portal of exit: secretions, excretions, droplets, skin

Reservoir: people, equipment, water

Causative agent: bacteria, viruses, fungi, protozoa, helminthes

Mode of transmission: direct, indirect, contact/vomite, injection/ingestion, airborne/aerosols

Portal of entry: broken, skin/mucous membrane, gastrointestinal/respiratory/urinary tract

Susceptible host: neonates, diabetics, immunosuppressed, cardiopulmonary disease

Chain of infection
TYPES OF HEPATITIS VIRUSES - A, B, C, D, E, G
- B, C, D - blood-borne infections
- A, E - fecal-borne infections
- G - patients who had liver disease, associated with other viral agents / conditions

IMPACT OF HEPATITIS B VIRUS - life-threatening liver infection (cirrhosis and liver cancer)

- Transmission - from mother to child at birth (perinatal transmission)
  - exposure to infected blood (blood transfusion, re-use of contaminated needles and syringes)
  - sexual transmission

Risk for health care personnel who have blood and body-fluid contact
• **Symptoms** - appear in 1-6 months incubation period:
  - itchy skin
  - loss of appetite
  - yellowing of the skin and eyes (jaundice)
  - nausea
  - dark urine
  - vomiting
  - extreme fatigue
  - abdominal pain

• **Diagnosis** - laboratory diagnosis of HBI
  *(detection of the hepatitis B surface antigen HBsAg)*

• **Prophylaxis** - vaccine
  *(offers a 98-100% protection)*
IMPACT OF HIV - damage of the immune system (*T4 helper lymphocytes*)
- leads to AIDS (*life-threatening condition*) - incubation period 1.5 - 11 years

• Transmission - sexually transmission
  - exposure to infected blood
  - from mother to child (*pregnancy, childbirth or breast-feeding*)

Risk for health care personnel who have blood and body-fluid contact
EXPOSURE RISKS AND EFFECT OF INFECTIONS ON DENTISTRY

- Symptoms - a flu-like illness within 1-2 months after the virus enters the body:
  - fever
  - headache
  - muscle aches and joint pain
  - rash
  - sore throat and painful mouth sores
  - swollen lymph glands, mainly on the neck

_In case of destroyed immune system (AIDS)_
  - diarrhea
  - weight loss
  - oral yeast infection
  - Herpes zoster
  - Kaposi sarcoma

_Latent infection_ - persistent swelling of lymph nodes

Diagnosis - quite high amount of HIV (viral load) in the bloodstream
MEDICAL HISTORY - purposes:

- to detect any unrecognized illness, requiring medical diagnosis and care
- to identify any infection / high risk important to a clinician
- to assist in managing and caring for infected patients
- to initiate use of adequate infection control procedures

ASEPSIS - absence of germs (*bacteria, viruses, and other MO*) that can cause disease

GOAL - to prevent cross-contamination, ensured by:

= use of sterile devices, materials and instruments
= creating an environment that is low in microbe volume

ANTISEPSIS - inhibition of the activity or destruction of pathogenic MO existing in their vegetative state on living tissue by chemical means
INFECTION CONTROL

PERSONAL BARRIER PROTECTION

PROTECTIVE GOWN - worn to:
- prevent contamination of normal clothing
- protect the clinician’s skin from exposure to blood + body substances

Protective clothing:

• Reusable or disposable for use
• Should be changed when soiled / contaminated by blood
• Should have a high neck and long sleeves - to protect the arms from splash and splatter
• Must be removed before leaving the workplace
• Should be washed:
  - in the laundry with health care facility
  - separately from other clothing
FACEMASKS:

• Prevent splatter from contaminating face
• Cover both the nose and mouth
• Edges of rectangular masks - pressed close around the bridge of the nose and face
• Masks with the highest filtration - rectangular, folded
• Should be changed regularly and between patients
• Should not be reused *(because of contamination)*
• In case of getting wet - change it *(even during patient treatment)*
• Maximum time for wearing masks - 1 hour
• For greater protection against splatter - a chin length plastic face shield
• Mask removal - grasp it only by its strings, not by the mask itself
INFECTION CONTROL  PERSONAL BARRIER PROTECTION

**HEAD CAPS** - to prevent hair contamination
- hair - properly tied *(restrained away from face)* ± covered

**PROTECTIVE EYEWEAR:**
- For clinician, assistants and patient
- Goggles / glasses ± solid side-shields ± face shield
- Protection against:
  - foreign bodies, splatter, aerosols
  - injury
  - microbes
- Eyewear - put on with clean hands before gloving
  - removal - with clean hands after gloves are removed
- Contaminated glasses - washed in soapy water + disinfection
GLOVES - to prevent contamination of hands in all dental procedures
  - to reduce the chances of transmission of infected MO
  - when handling ± cleaning materials / surfaces contaminated with body fluids

• Types - sterile / nonsterile latex / nitrile latex gloves
  powdered / nonpowdered

• Disposable, well-fitting treatment gloves

• Change of gloves - after each patient / during the procedure (torn / punctured)

• Overgloves / paper towels - for opening drawers, cabinets, etc.

• Handwashing - immediately before / after putting on / removal of gloves

• Heavy utility gloves - when handling ± cleaning contaminated instruments and for surface cleaning and disinfection

• Latex allergy
HAND WASHING - for infection control + reduction of cross-contamination
- always when gloves are changed

• Hand scrubs - alcohol-based hand rub (reduce number of viable MO)
  - antimicrobial soap
  - antiseptic - germicide (spray, gel) used for inhibiting or destroying MO

• Remove watches, jewelry, and rings

• Wash hands with a suitable cleanser (soap, antimicrobial soap)

• Use cleanser for at least 10 seconds + rub all surfaces + rinse

• Scrub under + around nails with a clean brush

• Washing - repeated at least once to remove all soil

• Before surgery - prescribed surgical scrub + wash + rinse from hands toward elbows
INFECTION CONTROL

PERSONAL BARRIER PROTECTION

TECHNIQUE OF HAND WASHING:

(A) Rub both palms
(B) Rub the back of both palms
(C) Rub palms again with fingers interlaced
(D) Rub back of interlaced fingers
(E) Wash back of thumbs
(F) Rub both palms with fingertips
INFECTION CONTROL

DISPOSAL OF WASTE

• Safe disposal of contaminated materials (*masks, gloves, blood-soaked / saliva-soaked sponges or cotton rolls*)

• Local county and state regulations for management + disposal of contaminated waste

NEEDLE DISPOSAL

• Needles, blades, sharps instruments - *discarded into hard-walled, leak-proof, and sealable containers*

• Avoid carrying unsheathed needles

• *Do not pass instruments + syringes with unsheathed needles to another individual*

• *Resheathing of needles - with one hand*
ASEPTIC TECHNIQUES

Contaminated items can be:
• discarded
• protected by disposable covers
• removed, cleaned, and sterilized

Operatory surfaces (*repeatedly touched or soiled*)
- protected with disposable covers (barriers)

Classification of instruments depending on the potential risk of infection when used:

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
<th>Examples</th>
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<tbody>
<tr>
<td>Critical</td>
<td>• Where instruments enter or penetrate into sterile tissue, cavity or blood stream</td>
<td>• Surgical blades and instruments</td>
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<tr>
<td></td>
<td></td>
<td>• Surgical dental bur</td>
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<tr>
<td>Semicritical</td>
<td>• Which contact intact mucosa or nonintact skin</td>
<td>• Amalgam condenser</td>
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<tr>
<td></td>
<td></td>
<td>• Dental handpieces</td>
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<tr>
<td></td>
<td></td>
<td>• Mouth mirror</td>
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<tr>
<td></td>
<td></td>
<td>• Saliva ejectors</td>
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<tr>
<td>Noncritical</td>
<td>• Which contact intact skin</td>
<td>• Pulse oximeter</td>
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<tr>
<td></td>
<td></td>
<td>• Stethoscope</td>
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<tr>
<td></td>
<td></td>
<td>• Light switches</td>
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<td>• Dental chair</td>
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</tbody>
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• **Critical** - contact cut tissues / penetrate tissues ➔ cleaned + sterilized
• **Semicritical** - handpieces, suction tips, etc. ➔ cleaned + sterilized / disposable covers
• **Noncritical** - environmental surfaces ➔ cleaned + disinfected
**DISINFECTION**

**DEFINITION** - process of destroying / inactivating germs or other harmful MO, by using chemical agents that kill the growing forms (vegetative forms) but not the resistant spores of bacteria and viruses.

**DISINFECTANTS:**

- To be active against 1) *Mycobacterium species*, 2) *polioviruses* or 3) *coxsackieviruses* (similar to HBV in resistance), 4) common respiratory viruses, and 5) common bacterial hospital pathogens (e.g., *Staphylococcus* and *Pseudomonas species*) readily inactivate HIV in 1 - 2 minutes

- Activity - reduced by organic debris or blood

- Water-based disinfectants - effective for removing dried blood

- Disinfectants containing 70% to 79% ethyl alcohol - most effective on cleaned surfaces

- Application - with paper towels or gauze pads
PRINCIPLES OF DISINFECTION:
• It cannot occur until fresh disinfectant is reapplied to a thoroughly cleaned surface.
• Disinfection does not sterilize.

DISINFECTION OF OPERATIVE SURFACES:
• Cleaning the surface
• Disinfectant (spray) - time for action ~ 2-3 minutes (depends on manufacturer)
• Wiping
• Disinfectant (spray) - time for action ~ 2-3 minutes (depends on manufacturer)
Steps of instrument processing:

- Presoaking (disinfection)
- Cleaning
- Corrosion control
- Packaging
- Sterilization
- Monitoring of sterilization
- Handling the processed instrument
INSTRUMENT PROCESSING PROCEDURES

- Removal of gross organic debris on instruments
- Soaking instruments in disinfectant detergent solution
  
  For small instruments
  Sol. Deconex BB (10 ml 30% H₂O₂, 10-15 ml liquid soap up to 1 l water) for 30 min.
  
  For large instruments (mirrors, probes, etc.)
  Sol. Deconex 50 FF + water - with concentration ≥ 0,5 - 1,5% for 30 min.

- Cleaning - manual scrubbing / ultrasonic cleaning
- Rinsing of instruments
- Drying of instruments with a folded towel
- Packaging - instruments organized in functional sets:
  
  fabric / sealed paper or cloth pouches
  paper-wrapped cassettes
STERILIZATION

DEFINITION - any process (physical / chemical) that will destroy all forms of life, including bacterial, fungi, spores and viruses

METHODS OF STERILIZATION:
1. Steam pressure sterilization (autoclave)
2. Chemical vapor pressure sterilization (chemiclave) - active ingredient 0.23% Formaldehyde
3. Dry heat sterilization (dryclave)
4. Ethylene oxide (ETOX) sterilization - toxic, not used on routine bases

STEAM PRESSURE STERILIZATION (Autoclaving)
light load of instruments - 121°C for minimum of 15 minutes at 1 atm (15 psi) pressure
wrapped instruments - 134°C for 3-7 minutes at 2 atm (30 psi) pressure

The higher the temperature and pressure, the shorter is the time required for sterilization!

Time required for the sterilizer to reach the correct temperature is not included!
STERILIZATION

ADVANTAGES OF AUTOCLAVING:
• A method for rapid increase of temperature
• All instrument surfaces are influenced by the steam
• The instruments can be wrapped prior to sterilization.
• The most rapid and effective method for sterilizing cloth surgical packs and towel packs.
• Suitable for handpieces
• Automated models are available

DISADVANTAGES OF AUTOCLAVING:
• Items sensitive to the elevated temperature cannot be autoclaved.
• Corrosion of carbon steel instruments and burs, steel neck / shanks of some diamond instruments
DRY HEAT STERILIZATION

Conventional Dry Heat Ovens - sterilization achieved at t° > 160°C
- Packs of instruments - placed at least 1 cm apart to allow heated air to circulate
- Sterilization time depends on:
  efficiency (size) of the oven  size of the load  how instruments are packaged
- Medium load of lightly wrapped instruments - at a range of 168°C-174°C for 60-90 min.

Short-Cycle, High-Temperature Dry Heat Ovens
- At 188°C-191°C for 6 min. (unwrapped instruments) or 12 min. (wrapped instruments)
## DRY HEAT STERILIZATION

### ADVANTAGES:
- Carbon steel instruments and burs do not corrode or lose their cutting edges
- Provide a larger capacity at a reasonable price
- Rapid cycles are possible at high temperatures

### DISADVANTAGES:
- Damage of more heat-sensitive items (rubber / plastic goods)
- Prolonged cycles at the lower temperatures
- Inaccurate calibration
- Lack of attention to proper settings
- Not suitable for handpieces
- Heavy loads of instruments, crowding of packs, heavy wrapping - easily defeat sterilization
**MONITORING OF STERILIZATION - weekly:**

**Mechanical monitoring** - to document time, temperature, and pressure
- automatically, with a printout tape
- *heat sensitive markers* (*tapes, bags*) changing their color under heat, pressure, or sterilization chemicals

**Chemical indicator strips:**
- *color-change indicator strips* into every pack
- slow color change, relative to the temperature reached in the pack

**Biologic monitoring strips** - *spore test strip* for weekly monitoring

**Documentation notebook**

**Dated sterilized instrument packs, bags, and trays**
ADVANTAGES OF MOISTURE CONTROL:

Patient Related Factors:

• Provides comfort
• Protects from swallowing or aspirating foreign bodies
• Protects soft tissues (*tongue, cheeks*) by retracting them from operating field

Operator Related Factors:

• A dry and clean operating field
• Increased accessibility to operative site
• Improved visibility of the working field and diagnosis.
• Infection control by minimizing aerosol production
• Prevents contamination of tooth preparation
• Improved properties of dental materials ➔ better results
METHODS OF MOISTURE CONTROL:

- Comfortable position of patient
- Direct methods
  - Rubber dam
  - Aspiration
  - Air-water syringe
  - Absorbent materials
  - Gingival retraction cord
  - Electrosurgery
- Local anesthetics
- Pharmacological methods
  - Antisialagogues
  - Antianxiety drugs
  - Muscle relaxants
ISOLATION WITH RUBBER DAM:

- **Definition:**
  - latex/nonlatex flat thin sheet held by a clamp and frame
  - perforated to allow the tooth/teeth to protrude through perforations
  - all other teeth are covered and protected by sheet
ISOLATION WITH RUBBER DAM:

• **Advantages:**
  - Complete, long-term moisture control
  - Retracts the soft tissue
  - Avoids unnecessary contamination through infection control
  - Prevents accidental swallowing or aspiration of foreign bodies
  - Improves the properties of dental materials
  - Defines operating field by isolation of one or more teeth from the oral environment
  - Provides protection of patient and dentist

• **Disadvantages:**
  - Takes time to be applied
  - Difficult communication with patient
  - Incorrect use may damage porcelain crowns/crown margins/traumatize gingival tissues
  - Insecure clamps can be swallowed or aspirated
**ABSORBENT MATERIALS** - cotton rolls, pellets, gauze:

- For short period of isolation (*in examination, polishing, pit and fissure sealant placement*)
- For teeth isolation, esp. when rubber dam application is not possible

- **Cotton rolls ± holder**
  - placed in buccal or lingual sulcus specially where salivary gland ducts exit
  - removal - when moist
Absorbent Materials

- **Advantages of absorbents:**
  - Effective to control small amounts of moisture for short time periods
  - Retract soft tissues at same time

- **Disadvantages:**
  - Provide only short-term moisture control
  - Ineffective if high volumes of fluid are present
  - Difficult placement + retention in shallow sulci and hyperactive tongue
LOW VOLUME EVACUATOR (SALIVA EJECTOR)

- To remove small amounts of moisture and saliva
- Used in conjunction with other methods of moisture control
- Can be bent to place in the required area of mouth.
- Tip of saliva ejector - smooth to prevent any tissue injury

**Advantages:**

- Economical
- Easy to use
- Can be held by patient
- Can be placed under rubber dam

**Disadvantages:**

- Difficult placement with hyperactive tongues
- Do not remove solids well
- Can be uncomfortable for patient
- May cause soft tissue damage
HIGH VOLUME EVACUATOR - facilitates fast removal of:

- Water from high speed drills
- Larger particles
- Air water spray
- Quadrant dentistry is made easy
- Double ended aspiration tip - for buccal and lingual side + retracts cheek and tongue

THROAT SHIELD

- Important when maxillary tooth is treated
- Avoids aspiration of small objects (indirect restorations, files)
- Unfold gauze (5 x 5 cm) is stretched over the tongue + posterior part of the mouth
1. Physico-mechanical methods for gingival retraction:

rubber dam  cotton rolls  wooden wedges  retraction cord

• Indications of gingival retraction

- Control of gingival flow or gingival bleeding
- In case of restorative margins close to gingiva (class V preparation)
- To extend margins subgingivally (cervical caries extending below the gingiva)
- For accurate recording of preparation margins (for impressions)
- For removing the hypertrophic gingiva, interfering with preparation margins
1. Physico-mechanical methods for gingival retraction:

Application of retraction cord:

- Anesthetize the area
- Select the appropriate size of cord (000,00,0,1,2,3)
- Length of cord so that it extends 1 mm
- Apply slight force laterally + slightly angulated towards the tooth surface
- Insert one end of the cord + stabilize it with blunt instrument + pack the rest of the cord
- Avoid putting ends of the cord interproximally
2. Chemical methods for gingival retraction - *Trichloroacetic acid, Sulfuric acid*

3. Chemical-mechanical methods for gingival retraction

   **Vasoconstrictors** - *Epinephrine, Norepinephrine*

   **Astringents** - *Alum (100%), Aluminum chloride (15-25%), Tannic acid (15-25%), Ferric sulphate (15%)*

   **Tissue coagulants** - *Zinc Chloride, Silver nitrate*

4. **Electrosurgical methods** - when conservative methods are ineffective

   **Advantages:**
   - *Rapid + easy procedure to obtain bloodless area*
   - *Atraumatic cutting of tissue + minimal bleeding during surgery*
   - *Primary wound healing*

5. **Surgery methods** - gingival removal with surgical blade
PREOPERATIVE PAIN CONTROL

**STEPS FOR LOWERING PATIENT’S ANXIETY and REDUCING PAIN PERCEPTION**

- Office tone - a calm, welcoming environment
- Good dentist-patient relationship
- Sense of giving the patient full control
- Keep the patient informed (*for sensations, procedures, treatment planning, etc.*)
- Modeling - observing a peer (either live or on an video)
- Distraction - music
- Effort to avoid pain during treatment - anesthesia
- Hypnosis
- Pharmacologic strategies
Effect depends on the movement of the dentinal fluid in the dentinal tubules in response to a stimulus.

- **Normally** - slow capillary outward movement does not stimulate the nerve endings and does not cause pain

- **Rapid changes in the environment (desiccating or drying dentin):**
  - displacement of the tubule content
  - sudden rapid fluid flow within the tubules
  - deformation of the cell membranes of free nerve endings in the pulp and predentin
  - damage to the cells
  - activation of pulpal nociceptors
  - pain
HYDRODYNAMIC THEORY OF DENTINAL PAIN

A SHORT AIR BLAST ➔ evaporation of 0.1-0.3 mm of fluid from the dentinal tubule ➔ immediate capillary fluid replacement from the pulp’s blood supply ➔ odontoblasts and nerve fibers are sucked into the tubule ➔ nerves are stretched or even torn off ➔ pain (A, B)

CONTINUOUS AIR BLAST ➔ a plug of fluid protein builds up in the tubule, (prevents fluid outflow) ➔ dentin insensitivity (C)

Fig. Pain produced by an air blast.

A. Air evaporates dentinal fluid, causing rapid outflow (arrows) owing to capillary pressure from the pulp’s vessels.

B. Odontoblast and accompanying nerve fiber aspirated into tubule, stretching nerve and causing pain.

C. Prolonged air blast caused a protein plug to form in the tubule, preventing outward flow
I. LOCAL ANESTHESIA
   1. Topical
   2. Infiltration
   3. Nerve block
   4. Supplementary techniques:
      a. intraosseous
      b. intraligamental
      c. intrapulpal
   5. Electroanalgesia
   6. Audioanalgesia
   7. Acupuncture
   8. Computer-aided slow injection devices

II. GENERAL ANESTHESIA
   1. Intravenous
   2. Inhalation
      (through a breathing mask or tube)

III. REGIONAL ANESTHESIA
   Spinal
   Epidural
   Nerve block

IV. HYPNOSIS
Effective local anesthesia - the bedrock of pain control in endodontics!

• **Topical anaesthetics** - rather psychological effect than real clinical efficacy

• The most common forms of *injectable local anesthetics are in the amide class.*

• **Types of anaesthetics:**
  - short duration (30 minutes of pulpal anesthesia)
  - intermediate duration (60 minutes of pulpal anesthesia)
  - long duration (over 90 minutes of pulpal anesthesia)

• **Clinical effect for one and the same anesthetic depends on the way of use - as a block or for infiltration!**
LOCAL ANESTHESIA
POSSIBLE ADVERSE EFFECTS OF ANESTHETICS

- **Cardiovascular reactions**
  *(tachycardia, changes in blood pressure, heart palpitations associated with anxiety or fear)*

- **Systemic effects**
  *(acute toxicity from an overdose, tremors, grand mal convulsions, sedation, hypotension, respiratory arrest)*

- **Methemoglobinemia** *(symptoms - cyanosis, dyspnea, emesis, and headache)*

- **Peripheral nerve paresthesia**

- **Allergic reactions to the anesthetic and/or latex**

- **Reactions to anesthetics containing a sulfite antioxidant** *(for anesthetics with vasoconstrictors)* - *allergic-like reactions: urticaria, bronchospasm, and anaphylaxis*
LOCAL ANESTHESIA

CONTRAINDICATIONS FOR USE OF ANESTHETICS:

- High blood pressure (higher than 200 mmHg / 115 mmHg)
- Cardiac dysrhythmias
- Unstable angina
- Less than 6 months since: myocardial infarction/cerebrovascular accident/ severe cardiovascular disease

POTENTIAL PROBLEMS IN USE OF ANESTHETICS WITH VASOCONSTRICTORS - for patients taking:

- Antidepressants
- Nonselective beta-blocking agents
- Medicine for Parkinson disease
- Cocaine
- Alcoholics
- Pregnant women
- Different medications - drug-drug interactions