

PRINIPLES OF EXODONTIA

Patient and surgeon preparation

Surgeon

1. You must prevent inadvertent injury or transmission of infection to your patient and your self's.
2. Your precaution builds on concepts that all patient's viewed as having **transmitted blood-borne diseases.**
3. To prevent transmitting in general; Dentist need to use ((surgical gloves, surgical mask, eye wear with side shields and wear long-sleeved gowns) and if the surgeon has long hair be held in position or be covered by surgical cap.

Patient

1. Sterile drape be put across patient's chest.
2. Patient vigorously repeat rinses his mouth with an antiseptic mouth rinse such as chlorhexidine.
3. Some surgeon put (4×4 inch) gauze loosely into the back of the mouth to prevent teeth or fragments from swallowed.

0 position → patient+ chair+ operator → critical for successful extraction.

Comfortable position surgeon → maximal control → force & forceps → patient's tooth.

Correct position → arm close to body → stability and support.

→ **wrist straight arm+ shoulder** → controlled **Delivered force.**

Not hand → **Delivered force**

Position of dental chair

1- Before seating a patient, the chair base should be lowered to a comfortable height, with the back of the chair up right, the operating light should be moved away and the arm of the chair raised or moved away to the side for easy access and not to counteract the patient.

2- The best possible position is one that is comfortable for both the patient and the surgeon. Chair adjusted in a way that head, neck, and trunk in one line will nullify any strain caused by stretching it backward or pushing it forward

Looking down to the dental chair from above view, the patient mouth - represents the center of the face of the clock, with **12 o'clock** being the location of the patients head and **6 o'clock** the patient's feet.

A right hand dentist will operate in an area between **8 o'clock and 12 o'clock** - and the assistant will be passed between **4 and 8** o'clock and the area between **12 and 1** o'clock should have very little activity.

The mirror image will be true for left hand dentist -

3-the position should allow the surgeon to keep his/her arm close to his/her body, which lends stability and support, also allows to keep his/her wrist straight enough to deliver maximum controlled force to the patient's tooth through the forceps.

4. The force should be delivered with the arm and shoulder, and not with the hand.

Height of chair

These height will allow the dentist's **arm to hang loosely** from shoulder girdle.

Procedures on the mandible; the occlusal plane of the mandibular teeth should be at level or slightly **below** the level of dentists elbow.

Procedures on the maxilla; the occlusal plane of the maxillary teeth should be **above** the level of the dentists elbow towards his/ her shoulders Height.

Angulations of the chair

working on mandibular side; the occlusal surface of the mandibular teeth are **parallel or at 10 degree** to the floor.

Working on maxillary side; the occlusal plane of the maxillary teeth is between angles of **45 degreee-60 degree** to the floor.

Chair light

The chair light should be adjusted, so that the dentist can clearly see what he is doing without bending or twisting and should have a good source of light. The light should be focused on the patient mouth and **not** on the patient eyes. The dentist should not provide a source of electricity during work. **(Not be in the way of light)**.

Position of the operator during extraction

The surgeon should position;

1. She/he can apply the forces necessary for extraction without any stress to his/her on back or shoulders.

2. The dentist should stand as erect as possible with his/her weight equally distributed on each foot, his feet apart ensure his foot are on flooring is such as to impair his balance, wrong posture of dentist will lead to curvature of the spine and pain in his feet , knees, limbo-sacral and sacroiliac region

3. Allow the surgeon to keep his/her arm close to his/her body, which lends stability and support an allows his/her wrist enough to deliver maximum controlled force, through the forceps

For the extraction maxillary teeth (anterior &posterior);

1. The surgeon should stand on the right side.

2. In front of the patient, the bent elbow applies the forceps on to the tooth.

3. The other hand holds the alveolus with the finger and thumb on either side of the involved tooth.

For extraction mandibular teeth;

1. The dentist should stand on the right side of the patient for both the quadrants.
2. For the extraction of the left lower side, the operator should stand in front of the patient (8oclock's).
3. The right lower side, the operator should stand behind the patient (10 o'clock).
4. Apart from supporting the alveolus on each side by the thumb and fore finger, the left hand should also support the mandible.

For L.A. administration;

- 1- for the lower right in front of the patient (8oclock's).
2. for lower left slight behind at (10 o'clock).
(Opposite for position in extraction)
3. for maxillary teeth (anterior & posterior); at right side of patient and in the front of the patient

Benefits of left hand during extraction

1. Retraction of lip, cheeks and tongue.
2. Stabilization of patient's head during extraction on the maxillary or mandibular teeth.
3. Supporting the buccal and lingual cortical plate.
4. To estimate the amount of pressure applied & amount of alveolar bone dilatation.
5. Prevention and protection against slipping of forceps and elevators.

Position of the left hand of the dentist

a) **Maxillary teeth extraction;** when extracting maxillary teeth, teeth in left side of the maxilla, the dentist places the thumb of the left hand palatally and index finger labially or buccally around the region of the teeth to be extracted . When extracting the teeth in the right side of maxilla, the thumb is placed buccally and the index finger placed palatally around the ridge containing the teeth to be extracted.

b) **mandibular teeth extraction;** when the **operator stands behind the patient;**

1- **lower right 3,4,5,6,7 and 8** the thumb of the left hand is place lingually and the index finger placed buccally around the supporting structures of teeth to be extracted with the other free fingers supporting the mandible extra orally.

when the **operator stands in front or right side** of the patient

2- **lower left 1,2,3,4,5,6,7, 8 and lower right incisor**_the middle finger of The left hand is placed lingually and the index finger labially or buccally while the thumb is to support the mandible extra –orally.

Supporting the mandible is important to prevent wrenching of the jaw and a Tempro-mandibular joint (T.M.J) subluxation or injury.

Sterilization and infection controls

Sepsis; is breakdown of living tissue by the action of microorganisms is usually accompanied by inflammation.

Asepsis; is the avoidance of pathogenic microorganisms ((of sepsis))

Medical Asepsis; is the attempt to keep patients, health care staff, and objects free of agents cause infection.

Surgical Asepsis ; is the attempt to prevent the microbes from gaining access to traumatic **surgically created wounds** by use of sterile instruments ,clothing and the **no touch technique.**

Antiseptic; A chemical that is applied to **living tissues** such as skin or mucous membrane to prevent infection by inhibiting the growth of bacteria.

Disinfected; a chemical used on **non-vital objects** to kill surface vegetative pathogenic organisms, but not spores or viruses.

Disinfection; a **process** by which an object, surface or medium is reduced of the viable microorganisms to an acceptable level, but may not inactivate some viruses and bacteria **spores.**

Antiseptic → **on living tissue.**

Substances prevent the multiplication of organism capable of causing infection

Disinfectant → **on inanimate object**

Sterility; freedom from **viable forms** of microorganisms.

Sterilization; is those processes by which freed **of all forms** of microbial life, either in vegetative forms **or** spore state.

The process of sterilization primarily uses heat, and those uses of disinfection are often restricted to the use of chemical.

Anti microbial physical agents;

- 1- Heat .a –Dry heat; 1- Direct open flame.
2- Hot air oven.
- b- Moist heat 1. Auto clave.
2- Boiling water.
3- Tantalization.
- 2- Radiation.
- 3- Filtration.

a) Heat methods;

Direct open flame; use for sterilize Nichrome or platinum culture transfer loop or wire.

Hot air oven; if properly used, hot air is an effective and accepted method of instruments sterilization for which a temperature of **160 C for one hour** or **190 C for 12 minute** is require.

Advantage;

1. Large volume capacity.
2. Low cost equipment.
3. No rusting or dulling for dry instruments.

Disadvantages;

1. Temperature over 160 C may result in melting of older instruments and impression trays.
2. Dry heat is not suitable for rubber plastic and most high speed hand pieces.
3. Longer cycle time accompanied with autoclave.

b) Moist –heat;

1. Autoclave; autoclave sterilize the instruments by use of steam under pressure ,heat transfer is rapid when moisture is present ,so autoclaves are considered to be the **most effective** method of sterilization –saturated steam is much more efficient in destroying microorganisms than either boiling water or dry heat. Autoclaves act at 121 C for 15 minutes at 15 Psi (pound per square inch) 131 C for 3-7 minutes at 30 Psi and 134 C 32 Psi for 3&1/2 minutes.

Advantages;

- 1- Autoclaves provide the most efficient and reliable sterilization.
2. Autoclave are usually quite simple to operate and relatively inexpensive.
3. Most dental interments devices can be safely autoclaved.
4. Flexibility of packing of instruments.

Disadvantage;

- 1- non-stainless metal instruments may be oxidized rusty unless protected by a reducing agent or emulsion dip prior to the packaging and autoclaving [0.2% sodium nitrates an effective rust inhibitor].
- 2- Low melting plastics and rubber caps may melt or destroyed.
- 3- Items that retain moisture take time to dry, thus extending the cycle time.

Boiling water boiling water 100 C will not kill spores; therefore this is a **disinfection** process and not a sterilizing process. Boiling water will kill vegetative bacteria with in 5 min. or less .boiling water can kills mycobacterium **TB** within 30 min .and also can destroy hepatitis B Viruses with in 30 min.

Disadvantage; 1- it cannot kills spores forming microorganism.

2- Water corrodes carbon steel instruments, so the addition of 1 % sodium carbonate or 0.2% sodium nitrate to the water is recommended to prevent corrosion.

Tantalization ((tyntalization))

This method utilizes free flowing steam (**not** steam under pressure as in autoclaving) of temperature of 100 C employing steam generators .media and solutions to be sterilized are exposed to the free flowing team for 30 min. which kills vegetative bacteria but not spore. The media solutions are then removed and incubated over night at 37 c. during this time most spores will germinate in to vegetative form. A second 30 min sterilization followed by incubation as before is carried out. Then the third exposure to the free flowing steam and incubation .this procedure should result in sterilization of the media or solutions.

2- Radiation

A-Gamma rays.

B- Ultraviolet light.

Gamma rays; these rays can penetrate paper boxes such as that of suture materials. Spore forming microorganisms requires longer and more concentrated exposure than the vegetative form. The unit of exposure is called **RAD** (Radiation Absorbed Dose), which is equivalent to 100 ergs of energy absorbed by (1 gm) of exposed rads. Doses of more than several Mega rads, maybe necessary to destroy spores.

B-Ultraviolet light

Ultraviolet lamp called the sterile lamp will effectively kill air borne tubercle bacilli in hospitals. Sterile lamp has been recommended to reduce the micro flora of **the air in operation room, laboratories and food processing plants.**

Sterile lamps aren't effective in sterilizing gauze, cotton and hand pieces because these rays have poor penetrating power and cannot reach the entire contaminated surfaces.

3- Filtration

microorganism can be removed from **solutions and fluids** like sera, enzymes, and microbial toxins which cannot be exposed to heat and chemicals without being chemically changed by filtration. Microorganisms are not killed by the filtration but are physically separated from the fluid as it passes through the filter or seine. Filters of a pore size of 0.2 micron in diameter can remove bacteria other than viruses. Filters of pore size 10 nanometer are recommended for the removal of viruses.

4- Ultrasonic vibration

When microorganisms are in a liquid suspension and exposed to sonic vibration micro bubbles are formed about the cell walls of the microorganisms causing disruption of cell, a process known as **cavitation.**

Antimicrobial chemical agents

1-chemoclave; un saturated chemical vapor of a mixture of formaldehyde, alcohol, ketone, water and acetone heated under pressure forms a gas that can sterilize **instruments** (heat at 132 C at 30 Psi for 20 min). The chemoclave must be heated before use.

Advantages; 1- rapid efficient cycle time. 2- Lack of rust and corrosion.

Disadvantage

1- The unsaturated chemical vapors do not penetrate heavily wrapped packages like steam.

2. The high temperature may melt plastics and rubbers.

3- Cannot sterilize hand pieces.

2- Ethylene oxide sterilizer

Ethylene oxide gas is useful for sterilizing any materials including **rubbers, plastics and hand pieces**. Ethylene oxide gases are toxic to all bacteria, fungi, viruses and spores at room temperature for 12 hours.

Advantage; this method can sterilize many materials except liquids.

Disadvantages; this gas is **carcinogenic** and is directly toxic to skin and for this ventilation to the outdoor is necessary.

3- Glutaraldehyde sterilization; this agent is useful as immersion solutions for **instruments and product** sterilization. For this method 6-10 hours are required for sterilization at room temperature.

Advantages; 1- heat sensitive plastics and rubbers can be safely sterilized.

2- No expensive equipment is required

Disadvantages 1- post sterilizing rinsing and handling are required.

2. Skins and mucus membrane toxicity require gloves during handling.

4-Halogens (chlorine and iodine)

Chlorine; A final conc. of 0.1-0.2 ppm of chlorine in water is used for **drinking** propose should render it free of pathogenic vegetative microorganisms (e.g. sodium hypohloride)

Iodine; the most widely used **skin** disinfectant before operations.

(e.g. Chlorhexidine & Hibitane)

5- Oxidizer. H₂O₂ (hydrogen peroxide) 3 %, Potassium permanganate

Staphylococci can produce the enzyme catalase which decomposes H₂O₂ into H₂O and O₂. The hastened oxygen liberated is toxic for **anaerobic bacteria** which may be associated with **PDL** disease.

6- Alcohol; Ethyl alcohol and isopropyl alcohol are miscible in water and are effective disinfectant in **conc. of 50-70 %**.

The antimicrobial effect of alcohol is associated with the following;

1- De maturation of protein.

2- Reduction of surface.

3. Lipid solvent

7- **Formalin tricresol**; it used as **root canal dressing** between visits of root canal treatment.

8- Surface tension depressor like soaps and detergents

Soaps are sodium or potassium esters of fatty acids. Soap posses surface tension reducing power and so it is effective in reducing microorganisms and debris from the skin and instruments in the emulsion formed in the washing process Detergent or surfactants also lower the surface tension and change the permeability of the bacterial cell membrane. So it chemically destruct microorganism and also facilitate **mechanical washing** or removal microorganism from the skin.

Basic techniques

.1.Avoid introducing infection; always using sterilized instruments, and wearing gloves.

2- Avoid being infected yourself by the operatives site; wear gloves, face and eye protection.

3- Reduce the contaminating load to the site; by pre-extraction cleaning of teeth use of **chlorohexidine** mouth rinse and prophylactic antimicrobials when appropriate.

4- cross-infection and its control; recent year problem with hepatitis **B** and its related agents, then with **HIV** and now with **HCV**, the majority of individuals with communicable viral particle are **asymptomatic** and hence not identifiable. Therefore safe practice mandate the use of sound cross-infection controls every day practice on all patients.

Aerosol; are easily created and area a potential source of cross- infection minimize where ever possible by high vacuum suction. Wear glasses and a mask face, exposure to an aerosol cannot be avoided masks are routine in theatre although of UN proven value in preventing infection

Cleaning and sterilizing; use disposable equipment when possible and **never reuse** clean instruments prior to sterilization. Use **disposable** or easily disinfected work surfaces **gloves**; should be worn routinely sterile glove; for surgery.

Immunitization; against Hepatitis B is available, **got it** and get all staff with clinical contact to o likewise.

Waste disposal; it is responsibility to ensure **sharps** are carefully placed in rigid, well marked containers.

If dentist hand injury accidentally happen

If it happens to you rinse Wound under running Water and record date and patient details. Contact public health laboratory for hepatitis [B, C] and HIV after appropriate risk assessment.