

**WOUND REPAIR**  
**CAUSES OF TISSUE DAMAGE**

**PHYSICAL**

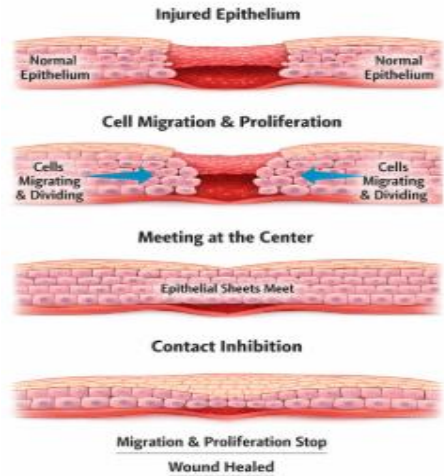
- **PHYSICAL** – includes **incision or crushing** extremes of **temperature** or **irradiation**, **desiccation** and **obstruction of arterial inflow** or **venous outflow**.

**CHEMICAL**

- **CHEMICAL** – include **unphysiologic pH or tonicity**, those that **disrupt protein integrity**, and those that **cause ischemia**.

**EPITHELIALIZATION**

- **Injured epithelium** has **genetically programmed regenerative ability** that allows to **re-establish its integrity** through **proliferation, migration** and a process known as **contact inhibition**.
- **Contact inhibition** happens when a **free edge of a normal epithelium** cease to **migrate** if it comes into contact with another free edge of epithelium.



**STAGES OF WOUND HEALING**  
**I. INFLAMMATORY STAGE**

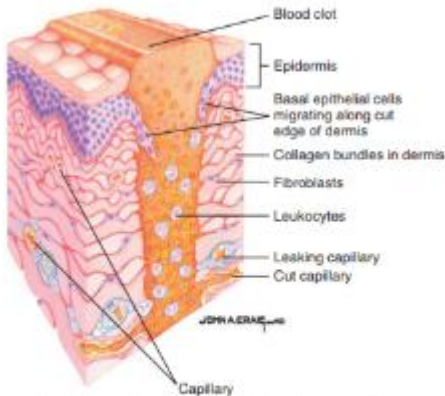
- begins the moment **tissue injury occurs**, last for **3 to 5 days**.

Has two phases:

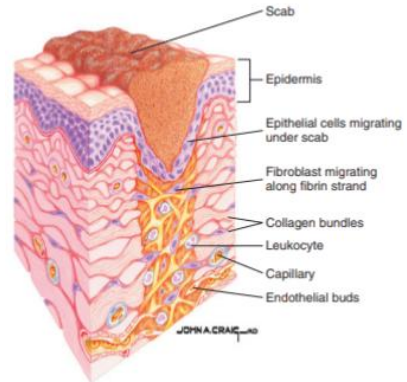
- **(1) Vascular Phase**
- **(2) Cellular Phase**

Also referred to as the **Lag Phase** because it is in this period that **No Significant Gain in Wound Strength Occurs**

**FIBRIN** - it is the **principal material holding the wound together** in this stage



• Fig. 4.2 Inflammatory (ag) stage of wound repair. Wound fills with clotted blood, inflammatory cells, and plasma. Adjacent epithelium begins to migrate into wound, and undifferentiated mesenchymal cells begin to transform into fibroblasts. (Netter illustration from [www.netterimages.com](http://www.netterimages.com). © Elsevier Inc. All rights reserved.)



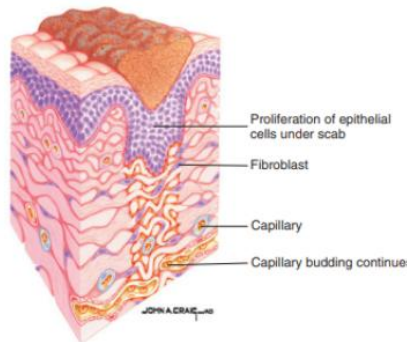
• Fig. 4.3 Migratory phase of fibroplastic stage of wound repair. Continued epithelial migration occurs, leukocytes dispose of foreign and necrotic materials, capillary ingrowth begins, and fibroblasts migrate into wound along fibrin strands. (Netter illustration from [www.netterimages.com](http://www.netterimages.com). © Elsevier Inc. All rights reserved.)

**CARDINAL SIGNS OF INFLAMMATION**

- Warmth (*calor*) -vasodilation
- Redness (*rubor*)- + in blood flow
- Swelling (*tumor*) - fluid transudation
- Pain (*dolor*)- inflammatory mediators
- Loss of function (*functio laesa*) - due to pain and swelling

**II.FIBROBLASTIC STAGE**

- Strands of fibrin crisscross forming a **latticework** on which fibroblasts begin laying down ground substance and tropocollagen.
- Lasts for **2 to 3 weeks**
- Clinically, the **wound at the end of this stage** will be **stiff** because of the **excessive amount of collagen**, erythematous because of the high degree of vascularization, and able to withstand **70% to 80%** as much tension as uninjured

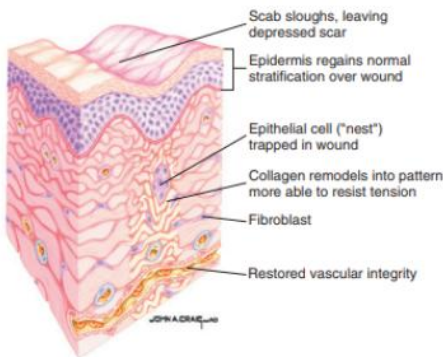


• Fig. 4.4 Proliferative phase of fibroplastic stage of wound repair. Proliferation increases epithelial thickness, collagen fibers are haphazardly laid down by fibroblasts, and budding capillaries begin to establish contact with their counterparts from other sites in wound. (Netter illustration from [www.netterimages.com](http://www.netterimages.com). © Elsevier Inc. All rights reserved.)

**III.REMODELING STAGE**

- Also called as **wound maturation**
- **Final stage of wound repair** that continues indefinitely
- Randomly **laid collagen fibers** from the previous stage are now replaced with new collagen fibers that are oriented to **better resist tensile forces** on the wound.

- **Wound Contraction**, the edges of the wound **migrate** towards each other.
- Sometimes, this phenomenon can cause problems like those seen on victims of a **third-degree burn**, who **develop deforming and debilitating contractures**.



• Fig. 4.5 Remodeling stage of wound repair. Epithelial stratification is restored, collagen is remodeled into more efficiently organized patterns, fibroblasts slowly disappear, and vascular integrity is reestablished. (Netter illustration from [www.netterimages.com](http://www.netterimages.com). © Elsevier Inc. All rights reserved.)

**FACTORS THAT IMPAIR WOUND HEALING**  
**FOREIGN MATERIAL**

- **FOREIGN MATERIAL** – includes **bacteria, dirt, and suture material**.
- Bacteria can **proliferate** and cause **infection**.
- Furthermore, **nonbacterial foreign material** like the **suture** used can act as a **haven of bacterial growth** and thus promotes **infection**, these materials can also stimulate **chronic inflammation** which **delays wound healing**.

**NECROTIC TISSUE**

- **NECROTIC TISSUE** – they serve as a **barrier to the ingrowth of reparative cells** and they can also act as a **niche for bacteria**.

**ISCHEMIA**

- **Ischemia** – this **decreases the delivery of oxygen and the nutrients** necessary for proper healing.
- Ischemia can be caused by **tight or incorrectly located sutures, improperly designed flaps, excessive external pressure, and the like**.

**TENSION**

- **Tension** – anything **that tends to hold wound edges apart**.
- It is best that edges of the wound are properly relieved from tension and must be re-approximated as passive as possible.

**BASIC METHODS OF WOUND HEALING**  
**PRIMARY INTENTION**

- There is **no tissue loss**; edges of the wound are placed and **stabilized** in the same anatomic position they held before injury
- **Healing** occurs **more rapidly**, has **lower risk of infection** with **minimal scar formation**

### SECONDARY INTENTION

- there is a **gap/tissue loss** between the edges of a wound, incision, or laceration that prevents close approximation of wound edges.
- this requires **large amount of epithelial migration, collagen deposition, contraction, and remodeling** during healing.

Examples:

- **extraction sockets**
- **poorly reduced fractures**
- **deep ulcers**
- **large avulsive injuries of the soft tissue**

### TERTIARY INTENTION

- refers to **healing of wounds** through the use of **tissue grafts to cover large wounds** and bridge the gap between wound edges.

### HEALING OF EXTRACTION SOCKETS

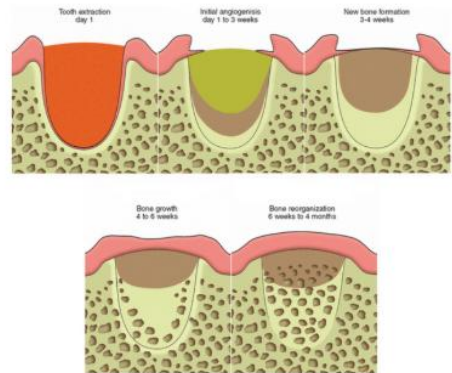
- as mentioned **extraction sockets heal by secondary intention.**
- Healing still follows the same sequence of **inflammation, epithelialization, fibroplasia and remodeling.**

**DAY 1: extraction socket is filled with blood** which eventually coagulates and seals the socket from the oral environment.

**1 to 3 weeks: inflammatory stage**

occurs as well as **fibroplasia.**

It is on the **2nd week** that **large amounts of granulation tissue** are seen filling the socket.



**3 to 4 weeks: Osteoid deposition**

begins for new bone formation.

**4 to 6 weeks: Epithelialization** is almost complete at this time.

**Cortical bone** continues to be resorbed from the crest and walls of the socket, new trabecular bone is laid down across the socket.

**6 weeks to 4 months: Cortical bone** lining the socket is **fully resorbed**, bone fills the socket. The epithelium moves toward the crest and eventually becomes level with adjacent crestal gingiva.

### BONE HEALING

- follows the **same healing process** of **soft tissues and/or oral mucosa.**

- **Osteoblasts and osteoclasts** plays a vital roles in the healing process.

### 1.OSTEOBLASTS

- **Osteoblasts – lay down osteoid** which goes on to calcify

### 2.OSTEOCLASTS

- **Osteoclasts – resorbs necrotic bone** and bone that needs to be remodeled.
- **PRIMARY INTENTION** - occurs when the **bone is incompletely fractured** or the fractured ends do not become separated from each other (e.g. greenstick fracture).
- **SECONDARY INTENTION**- occurs when the **fractured ends of the bone** are **more than 1 millimeter** apart in which a large amount of collagen must be laid down to bridge the bony gap.

*Two important factors for proper bone healing:*

- **Vascularity – fibrous connective tissue** that forms in a bony fracture site requires a high degree of vascularity.
- If **vascularity or oxygen supply** is **not enough**, **cartilage forms** instead of bone.

- **Immobility – mobility on a healing bone** poses a compromise on its vascular supply.
- It also promotes **wound infection** if the fracture is contaminated.

### NERVE INJURIES

In oral surgery, the **two branches of Trigeminal nerve** that is commonly injured are:

- (1) Inferior alveolar-mental nerve and**
- (2) lingual nerve**

### TYPES OF NERVE INJURIES NEURAPRAXIA

- **NEURAPRAXIA- LEAST SEVERE** FORM OF PERIPHERAL NERVE INJURY.
- IT IS A **CONTUSION OF A NERVE** IN WHICH CONTINUITY OF EPINEURAL SHEATH AND THE AXON IS MAINTAINED.
- **COMMON CAUSES** THAT PRODUCE THIS NERVE INJURY INCLUDES: **BLUNT TRAUMA OR STRETCHING OF NERVE, INFLAMMATION AROUND THE NERVE OR LOCAL ISCHEMIA OF A NERVE.**

### AXONOTMESIS:

- **Axonotmesis - continuity of the epineural sheath** is maintained

however the axons continuity is disrupted.

- **Severe blunt trauma, nerve crushing or extreme stretching of the nerve** can produce this type of injury.

### NEUROTOMESIS

- **Neurotmesis - most severe type** of nerve injury, involves **complete loss of nerve continuity**.
- This can be produced by **badly displaced fractures, severance by bullets or knives** or by iatrogenic transection.

### TWO TYPES OF NERVE HEALING 1. DEGENERATION

- **Degeneration**
  - Segmental demyelination
  - Wallerian degeneration

### 2. REGENERATION

- **Regeneration**
  - Begins almost immediately after nerve injury

### INFECTION CONTROL IN SURGICAL PRACTICE

#### IMPORTANCE OF INFECTION CONTROL

- **Infection control** is of **paramount importance in the dental clinic to safeguard the health and well-being of patients, dental healthcare personnel, and the broader community**.

- Dental procedures involve close contact with patients' oral cavities, which are rich in bacteria and other microorganisms.
- Without proper infection control measures, these microorganisms can **easily be transmitted and lead to the spread of infectious diseases**.

### PATIENT SAFETY

- **Infection control** practices in the dental clinic are primarily aimed at **ensuring patient safety**.
- Dental procedures often involve the use of **instruments, devices, and materials** that come into contact with **patients' blood, saliva, and mucous membranes**.
- Without adequate infection control measures, these materials can serve as a **source of infection transmission**.
- By **implementing strict protocols** for **sterilization, disinfection, and asepsis**, the risk of transmitting infectious agents between patients can be **minimized**, thus **safeguarding patient health**.
- **Patient safety** is a **paramount consideration** in infection control within the dental clinic.
- Implementing **robust infection control measures** is essential to protect patients from the risk of acquiring healthcare-associated

infections (HAIs) during dental procedures.

**Here are some key points highlighting the importance of patient safety in infection control:**

### 1. PREVENTION OF HEALTHCARE-ASSOCIATED INFECTIONS (HAIs)

- In dental settings, patients may be **exposed to various microorganisms** present in the oral cavity or the environment.
- **Effective infection control measures**, such as proper hand hygiene, sterilization of instruments, and surface disinfection, help **prevent the transmission of pathogens and reduce the risk of HAIs**.
- **By maintaining a clean and safe environment, healthcare dental professionals** can ensure the well-being and safety of their patients.

### 2. PROTECTION AGAINST CROSS-CONTAMINATION

- **Cross-contamination**, the **transfer of microorganisms** from one patient to another or from contaminated surfaces to patients, can occur during dental procedures.
- **Patient safety** relies on **strict adherence to infection control** protocols to minimize the risk of cross-contamination.

- This includes appropriate use of **personal protective equipment (PPE), proper sterilization and disinfection techniques, and aseptic procedures** during patient care.

### COMMUNICABLE PATHOGENIC ORGANISMS

#### BACTERIA

- **Streptococcus spp.**
- **Actinomyces spp.**
- **Anaerobic bacteria**
- **Candida spp.**

#### SIGNIFICANT VIRUSES IN DENTISTRY

- **Hepatitis B Virus (HBV)** is a **bloodborne DNA virus** that primarily **affects the liver** and can cause serious liver infection.
- It is a major public health concern worldwide, with millions of people affected by **chronic HBV infection**.
- **Dental healthcare personnel** may be at **risk of exposure** through **infected blood or other potentially infectious materials**.

#### ROLE IN ORAL INFECTION

- **HBV** mainly **affects the liver**, causing **acute or chronic hepatitis** that leads to **liver inflammation** and **long-term complications**.
- Although the liver is the primary organ affected, HBV can also

produce **oral manifestations** and may **influence oral health**.

### TRANSMISSION

**HBV** is transmitted through **contact with infected body fluids**, including:

- **Blood**
- **Saliva**
- **Semen**
- **Vaginal secretions**

In the **dental setting**, **transmission** may occur through:

- **Exposure to infected blood**
- **Contaminated dental instruments**
- **Failure to follow proper infection control measures**

### CLINICAL PRESENTATION

**HBV infection** can cause **several oral and systemic manifestations**, including:

- **Jaundice**
- **Oral ulcers**
- **Enlarged salivary glands**

These manifestations are **not exclusive to HBV** and may also appear in other viral hepatitis infections.

### PREVENTION AND CONTROL

**Preventing HBV transmission** in the dental clinic is important to protect patients and dental healthcare personnel.

#### a. Vaccination

- **HBV vaccination** is **highly effective** in preventing infection.

#### b. Standard Precautions

- Follow **strict infection control practices** in dental settings.

#### c. Patient Screening

- Screening helps **identify patients who are carriers or have active infection**.

#### d. Universal Precautions

- Treat all patients as **potentially infectious for bloodborne pathogens**.

#### e. Safe Injection Practices

- Use **sterile, single-use needles and syringes**.

#### f. Post-Exposure Management

- If exposure occurs, **immediate evaluation and treatment** are required.

#### g. Patient Education

- Educate patients about:
  - **HBV transmission**
  - **Prevention**
  - **Importance of disclosing HBV status**

### SIGNIFICANT VIRUSES IN DENTISTRY

- **Human Immunodeficiency Virus (HIV)** is the **virus** that **causes Acquired Immunodeficiency Syndrome (AIDS)**.

- It is a **retrovirus** that **attacks the immune system**, specifically the **CD4+ T cells**, **weakening the body's ability to fight infections and certain cancers.**
- Although the risk of HIV transmission in dental clinics is **extremely low**, **dental healthcare personnel** must **follow standard precautions and infection control practices** to reduce exposure to infected blood or other infectious materials.

#### ROLE IN ORAL INFECTION

- **HIV does not directly cause oral infections**, but it can lead to **oral manifestations and opportunistic infections**, especially in individuals with advanced HIV disease.
- These oral conditions may indicate **progression of the disease and declining immune function.**

#### ENDOCRINE DISORDERS:

HIV is primarily transmitted through contact with **certain infected body fluids**, including:

- **Blood**
- **Semen**
- **Vaginal secretions**
- **Breast milk**

In **dental settings**, transmission may occur through:

- Exposure to **blood**

- Contact with **potentially infectious materials**
- **Saliva contaminated with blood** if infection control measures are not followed

#### CLINICAL PRESENTATION

**Oral manifestations of HIV infection** may include:

- **Oral candidiasis**
- **Oral hairy leukoplakia**
- **Oral ulcerations**
- **Periodontal disease**
- **Kaposi's sarcoma**

These conditions may cause **pain, discomfort, and affect the oral health and quality of life** of individuals with HIV.

#### PREVENTION AND CONTROL

**Preventing HIV transmission** in the dental clinic is important to protect patients and dental healthcare personnel.

##### a. Standard Precautions

- Strict adherence to **standard precautions** is necessary.

##### b. Patient Screening and Medical History

- Screening patients for **known HIV infection** and reviewing their **medical history** helps dental professionals provide appropriate care.
- **Confidentiality and non-discrimination** are important

when managing patients with HIV.

### c. Universal Precautions

- Treat **all patients as potentially infectious**, regardless of HIV status.
- This **reduces the risk of exposure to bloodborne pathogens**, including HIV.

### d. Needlestick and Sharps Injury Prevention

- **Proper handling and disposal of sharps**
- Use of **safety-engineered devices**
- Following **safe injection practices**

### e. Post-Exposure Prophylaxis (PEP)

- If potential exposure occurs, **post-exposure prophylaxis (PEP)** should be started promptly.
- PEP involves a **time-limited course of antiretroviral medications** to reduce the risk of infection.

### f. Patient Education and Counseling Educating patients about:

- **HIV transmission**
- **Prevention**
- **Importance of disclosing HIV status**

- Dental healthcare professionals and patients may come into contact with blood and other **potentially infectious materials**.
- This poses a risk of transmission of bloodborne pathogens, such as **hepatitis B virus (HBV)**, **hepatitis C virus (HCV)**, and **human immunodeficiency virus (HIV)**.
- **Adhering to standard precautions**, including the use of **personal protective equipment (PPE)**, **safe handling of sharps**, and **proper disposal of contaminated materials**, helps prevent the transmission of bloodborne pathogens and reduce the risk of HAIs.

## SIGNIFICANT VIRUSES IN DENTISTRY

- **Mycobacterium tuberculosis** is the **bacterium** that causes **tuberculosis (TB)**, a **chronic infectious disease** that mainly **affects the lungs** (*pulmonary tuberculosis*) but can also affect other parts of the body.
- **TB** remains a **significant global health problem**, and dental healthcare workers must be aware of the disease because it can be transmitted through the air.

## ROLE IN ORAL INFECTION

- Although TB primarily **affects the lungs**, it can sometimes cause **oral manifestations**,

## PROTECTION AGAINST BLOODBORNE PATHOGENS

particularly in individuals with **advanced or untreated tuberculosis.**

- **Oral tuberculosis** may appear as **chronic ulcers or lesions in the oral cavity**, which can affect areas such as **the tongue, palate, lips, or gingiva.**

### TRANSMISSION

**Mycobacterium tuberculosis** is transmitted through **airborne droplets.**

**Transmission** occurs when an infected person:

- **Coughs**
- **Sneezes**
- **Talks**
- **Breathes**

These actions release **droplet nuclei containing the bacteria** into the air, which can then be **inhaled by others.**

In dental settings, there is potential risk due to **close contact with patients and exposure to aerosols.**

### CLINICAL PRESENTATION

Common symptoms of tuberculosis include:

- **Persistent cough**
- **Chest pain**
- **Coughing up blood (hemoptysis)**
- **Fever**
- **Night sweats**
- **Weight loss**

- **Fatigue**

Oral tuberculosis may present as:

- **Chronic non-healing ulcers**
- **Painful oral lesions**
- **Swelling in oral tissues**

### PREVENTION AND CONTROL

Preventing *Mycobacterium tuberculosis* transmission in the dental clinic is important to protect patients and dental healthcare personnel.

#### a. Early Detection and Medical Referral

- Patients suspected of having **active tuberculosis** should be **referred for medical evaluation** before dental treatment is performed.

#### b. Infection Control Measures

Dental clinics must follow **strict infection control protocols**, including:

- Proper **ventilation**
- Use of **personal protective equipment (PPE)**
- Following **standard precautions**

#### c. Use of Masks and Respiratory Protection

- When treating patients with suspected or confirmed TB, **appropriate respiratory protection (such as masks or respirators)** should be used to reduce inhalation of infectious droplets.

**d. Patient Screening**

- Taking a **thorough medical history** helps identify patients who may have **active TB symptoms** or a **history of tuberculosis infection**.

**e. Postponement of Elective Dental Treatment**

- Elective dental procedures should be **postponed for patients with active, untreated TB** until they are **no longer infectious and have received appropriate medical treatment**.

**f. Patient Education**

Patients should be educated about:

- **TB transmission**
- Importance of **medical treatment and adherence to medication**
- Preventing the **spread of infection to others**

**evacuation systems, and appropriate respiratory protection**, help minimize the spread of aerosol-transmitted infections and prevent HAIs.

**MITIGATION OF ADVERSE EVENTS**

**Mitigation of Adverse Events**

- Inadequate infection control practices can lead to **adverse events**, ranging from **minor infections to serious complications**.
- These adverse events not only compromise patient safety but also impact their overall well-being and trust in the dental healthcare system.
- By prioritizing infection control, dental professionals can significantly reduce the occurrence of adverse events, ensuring a safe and positive experience for their patients.

**MITIGATION OF INFECTIONS AEROSOL-TRANSMITTED**

- Dental procedures can generate **aerosols** and **splatter**, which may contain microorganisms from the oral cavity.
- These aerosols can potentially **transmit respiratory pathogens**, such as **influenza viruses** or **Mycobacterium tuberculosis**.
- Effective infection control measures, including **proper ventilation**, use of **high-volume**

**REDUCTION OF INFECTION RISK**

**Reduction of Infection Risk**

- In the dental clinic, patients may be exposed to various microorganisms, including **bacteria, viruses, and fungi**, during procedures such as **dental cleanings, restorations, or surgical interventions**.
- Strict adherence to infection control protocols, such as **proper hand hygiene, sterilization of instruments, and disinfection of surfaces**, **significantly reduces the risk of**

transmitting these microorganisms and prevents HAIs.

#### PREVENTION OF SURGICAL SITE INFECTIONS

- Invasive dental procedures, such as oral surgery or implant placement, carry a risk of **surgical site infections (SSIs)**.
- Implementing aseptic techniques, including proper **hand hygiene, sterile instruments, and maintaining a sterile surgical field**, is crucial for preventing SSIs.
- These measures **reduce the introduction of microorganisms** into surgical sites, promoting healing and minimizing the risk of HAIs.

#### UNIVERSAL PRECAUTIONS

- Treat all blood/body fluids as **infectious**

Required PPE:

- **Gloves**
- **Face masks**
- **Protective Eyewear**
- **Head cap**
- **Laboratory gown**

#### KEY DEFINITIONS

- **Antiseptic** – Used on **living tissues**
- **Disinfectant** – Used on **inanimate objects**
- **Sterility** – **Complete absence of**

- **microorganisms**
- **Medical asepsis** – **Reduces microorganisms**
- **Surgical asepsis** – **Prevents wound contamination**

#### TECHNIQUES OF INSTRUMENT STERILIZATION STERILIZATION METHODS (HEAT AND GAS)

##### Dry Heat

- Oxidizes proteins
- Longer time required
- Less rusting

##### Moist Heat (Autoclave)

- Denatures proteins
- **Faster & more effective**
- May rust instruments

##### Gas Sterilization

##### Ethylene Oxide

- For heat-sensitive materials
- Effective against spores
- Requires long aeration time
- Toxic & requires special equipment

#### TECHNIQUES OF INSTRUMENT DISINFECTION DISINFECTION

##### Chemical Disinfection

Used when heat sterilization is not possible:

- **Glutaraldehyde (most common)**
- **Iodophors**
- **Chlorine compounds**
- **Formaldehyde**

## SURGICAL FIELD AND OPERATORY MAINTENANCE

To prevent contamination:

- Use sterile Mayo stands
- Disinfect all surfaces with hospital-grade disinfectants
- Use protective barriers changed between patients
- 0.2% chlorine or 2% glutaraldehyde can prevent hepatitis transmission

## SURGICAL STAFF AND PATIENT PREPARATION

Clean Technique

- No incision
- Standard PPE

Sterile Technique

- Used when incision is made
- Surgical hand scrub
- Proper sterile glove donning

Common antiseptics:

- Iodophors
- Chlorhexidine
- Hexachlorophene

Patient Preparation

- Disinfect perioral tissues (iodophor)
- 0.12% chlorhexidine mouth rinse
- Use sterile saline/water for irrigation
- Proper draping

## SHARPS MANAGEMENT

- **Main risk: Needle-stick injuries**
- **Handle using instruments**
- **Dispose in rigid, labeled containers**
- **Follow hazardous waste protocol**

## PAIN AND ANXIETY CONTROL LOCAL ANESTHESIA

- The ability to **locally anesthetize a specific part of the body**
- To **manage the pain** produced during surgery and early postoperative period
- The administration of local anesthetics must follow well-established principles in order to obtain adequate anesthesia and to **avoid undesirable side-effects**
- **All injection** must be made **slowly**, whether the patient is awake or under sedation or general anesthesia, to prevent a large bolus of anesthetic with vasoconstrictor from being directed to the heart in an inadvertent intravascular injection

## MECHANISM OF ACTION

- It **blocks the function of sensory nerves**, they are also able to **inhibit motor nerves** and other nerve tissue.
- It prevents nerve impulse transmission

- The end results are that the nerve membrane remains in a polarized state unable to conduct impulses and it signals to transmit the pain sensation

### **AFFERENT NERVE FIBER**

- occurs **pain, heat, and touch**

### **TOXIC REACTIONS**

- Occurs when **too much Local Anesthetic enters the blood** producing harmful effects on the **Central nervous system (CNS) and Cardiovascular system**, called **Local Anesthetic Systemic Toxicity**

### **ANXIETY CONTROL**

### **MANAGEMENT OF PATIENT ANXIETY IS MORE IMPORTANT FACTORS IN ORAL SURGICAL PROCEDURES**

- The **most common medical emergency in dentistry**; caused by **sudden drop in heart rate and blood pressure**.
- Triggered by **anxiety, fear, pain, or sight of blood**.
- **Signs: pallor, sweating, dizziness, nausea, slow pulse, temporary loss of consciousness**.
- **Management: stop treatment, place patient in supine position with legs elevated, maintain airway, monitor vitals, administer oxygen** if needed.

### **1. CONSCIOUS SEDATION**

**1. CONSCIOUS SEDATION** - Helps patient to undergo surgical procedures with both physical and mental comfort

- **Oral Sedation** - Sedation with **Anxiolytic drugs (*Diazepam & Lorazepam*)** with or without a narcotic
- **Pharmacologic Sedation** - Sedation by the inhalation of **Nitrous oxide** is frequently the technique of choice for the **anxious patient** who has **mild to moderate anxiety**.
- **Nitrous oxide sedation** - is an **odorless and colorless gas** that is not irritating to airways

### **Nitrous oxide sedation (Laughing gas)**

- is an **odorless and colorless gas** that is not irritating to airways
- This makes useful when providing oral surgery as well as for the patient who primarily **fear local anesthetic injection**.
- Has a remarkable **good margin of safety** and ease of administering it as supplement to local anesthesia

**GOAL:**

1. This technique helps **reduce anxiety** in the patient
2. To permit the **use of good anesthetic techniques**
3. To help protect **normal physiologic response of the cardiovascular and respiratory systems**
4. To do things **safety and comfort**

It is essential to **evaluate the width of the patients spectrum** when using sedation.

- **Sedation:** is **not a general anesthetic stage**, The **patients retains all protective reflexes** and is **easily aware of the surroundings**

The **Classification of Physical status** as defined by the **American Society of Anesthesiology** is useful:

- I. A patient **without systemic disease**; A **normal healthy patient**.
- II. A patient with **mild systemic disease**
- III. A patient **severe systemic disease that limits Activity** but not incapacitating.

There are **more three more categories**, each more serious in regard to survival, so patients in these categories would not be acceptable.

**2. GENERAL SEDATION**

**GENERAL ANESTHESIA**

- is a deep state of **unconsciousness, where you will be “asleep”** for the procedure.
- **Inhalation / Intravenous routes** - are **preferred delivery** for **precise anesthetic administration**