# HANDBOOK FOR DENTAL CHAIR SIDE ASSISTANTS

## PART 1

Editor:
**Namita Kalra**

**Bentham Books**

# Handbook for Dental Chair Side Assistants
## *(Part 1)*

Edited by

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**Handbook for Dental Chair Side Assistants (Part 1)**

Editor: Namita Kalra

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# PREFACE

This book was conceived over a period of more than a decade. The chairside assistant plays a pivotal role in successful management of dental patients as they enter the dental clinic. The chairside assistant helps in allaying anxiety of the patient, maintains records of dental patients, and helps to lay out all the necessary instruments and materials for the procedure as per the plan. The chairside assistant needs to have good knowledge of the anatomy, psychology, diseases, instruments, materials, procedures, and latest technology. This book intends to prepare the dental chairside assistants and dental nurses in providing efficient assistance to the dentist in a dental clinic. They play a silent but crucial role in overall management of patients with various orodental disorders. The book will provide them with the theoretical background and practical tips, and give them deeper insight into their work and responsibilities. It will give them a chance to upgrade their knowledge and skills. The book is rich in real-life pictures, which are well described to make the process of learning attractive and lucid.

This book will also provide an overview to the dental interns for good revision and useful tips to the students as they enter the internship phase. It will also be useful to the postgraduate students before they enter the dental clinics. The book has many real-life photographs, which make it very interesting.

Most of all, this will provide dental chairside assistants and dental nurses with a handbook to which they can refer to and learn, facilitating their role as good dental chairside assistants and dental nurses.

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# Basic Sciences

# CHAPTER 1

# General Human Anatomy

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**Abstract:** The chapter deals with basic general human anatomy. The basic idea is to get the student oriented to gross surface anatomy, the bones, and organs so that he is able to relate to diseases and scientifically record blood pressure and perform venipuncture. This chapter will also orient the student to related surface anatomy for basic life-saving procedures.

**Keywords:** Planes, Cranium, Thorax, Muscles, Sinoatrial Node.

## HUMAN ANATOMY FOR THE DENTAL CHAIR-SIDE ASSISTANTS

- Introduction and general anatomy.
- Important organs of the thorax.
- Upper limb and its clinical significance.
- Head and neck region.

Anatomy is the study of body parts and their relationships. It is divided broadly into 3 divisions:

1. **Macroscopic or gross anatomy** – In this type, parts of the body are studied as seen by the naked eye, *e.g.*, heart and lung.
2. **Microscopic** – In this type, very small structures are studied that cannot be seen by the naked eye and require a microscope to see them, *e.g.*, cells and tissue sections.
3. **Embryology** – It is the study of development that takes place before the birth of an individual.

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## INTRODUCTION AND GENERAL ANATOMY

The accurate use of anatomic terms by the team of doctors, nurses and chairside assistants is required to enable them to communicate with one another. For that, a language of anatomy has been internationally accepted in which the patient is always presumed to be in a position called **Anatomical Position** (Fig. **1**).

In the **anatomical position**, the patient is presumed to be standing erect, looking forward, the upper limbs resting by the sides of the body, and the face, palms and toes pointing forward.

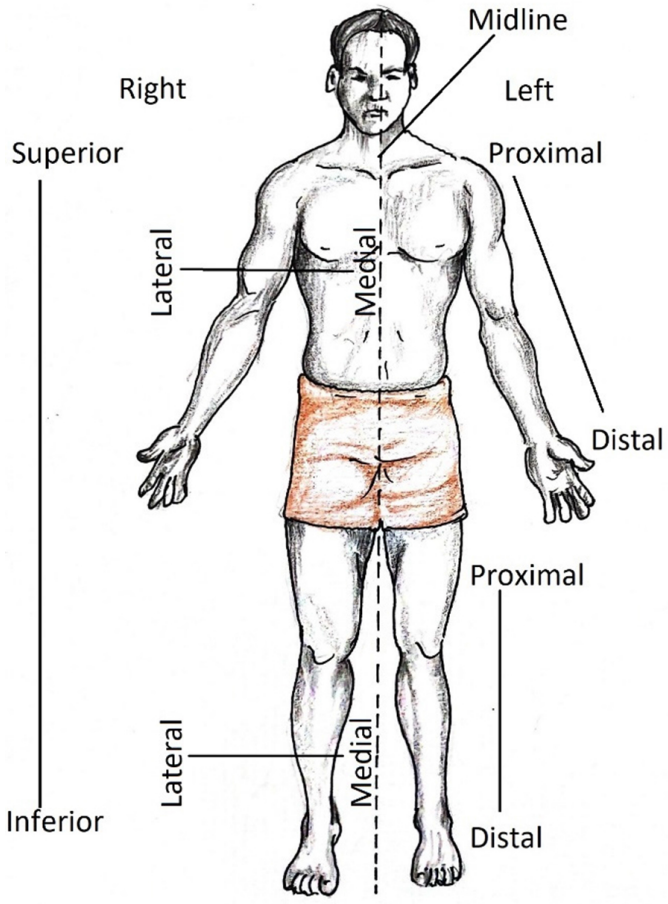


**Fig. (1).** Common terms used in anatomy.

## Terminology to Describe Body Position

- **The prone position**: When the body is lying facing downward.
- **The supine position**: When the body is lying on the back.
- **Lithotomy position**: When the lower limbs are bent and feet rest on the bed, the thighs are pulled apart to expose the perineum.

## Anatomical planes (Fig. 2)

- Median/sagittal plane.
- Parasagittal plane.
- Coronal plane.
- Transverse plane.
- Oblique plane.

- **Coronal planes:** They are imaginary vertical planes drawn at right angles to the median plane dividing the body into an anterior and posterior part.
- **Horizontal or transverse planes:** These planes are at right angles to both the median and the coronal planes. They divide the body into a superior and inferior part.
- **Median or sagittal plane:** This is a vertical plane passing through the center of the body, dividing it into equal right and left halves.
- **Planes situated parallel to the median plane termed as paramedian planes**: They divide the body into right and left unequal parts.
- All the planes are reference planes.

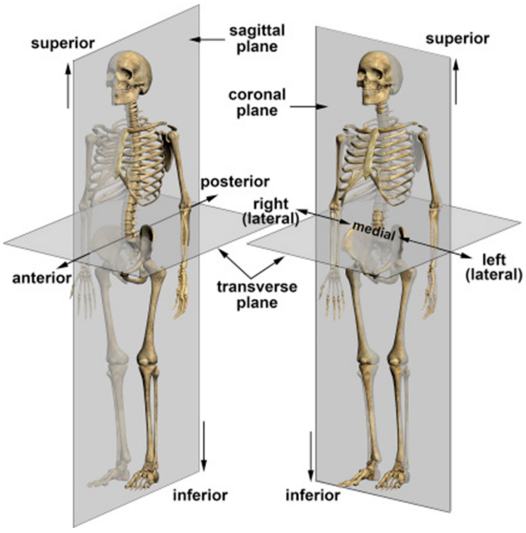


**Fig. (2).** Anatomical position showing planes and anatomical terms.

**CHAPTER 2**

# General Human Physiology

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**Abstract:** The chapter deals with the basis of human physiology, that is, the human cell. It also explains the functioning of the cardiovascular system, the nervous system, and the digestive system. It is of paramount importance for the student to understand basic human systems functioning so that he can be of value in assistance during a life-saving procedure and also be able to rationalise all precautions for patient care.

**Keywords:** Atrium, Ventricle, Electrocardiogram, Neuron, Gases, Bolus.

## INTRODUCTION TO HUMAN PHYSIOLOGY

The term physiology originated from the Latin word physiologia, which means "natural science or the study of nature". Human physiology deals with the normal functions of our body. Before we understand the functioning of the body, it is important to understand the fundamental unit of life, which is the cell (Fig. **1**).

The three principal constituents of a cell are:

A. Cell membrane – Outer covering (Fig. **1**);
B. Nucleus and its chromosomes – Mastermind (blueprint) of life (Fig. **1**);
C. Cytoplasm and its organelles – Functionaries (Fig. **1**).

These cells come together to form tissues of various types to perform specialized functions. They are held together by various means, which are defined as follows:

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**Namita Kalra (Ed.)**

i. Tight junctions: these prevent the movements of ions and other solutes from one side of the membrane to the other., for *e.g.,* walls of the renal tubules, choroid plexus, *etc*.
ii. Desmosomes or intercellular junctions: they hold the adjacent cells together firmly in the areas that are subjected to stretching, such as skin and heart muscle.
iii. Gap junctions, also called nexus: these are channels present between the membranes connecting the cytoplasm of adjacent cells. They allow the fast propagation of the potential electronic variation from one cell to the other, *e.g.,* cardiac and smooth muscle cells.

7% of body weight is mineral in an ordinary young person, 15% is fat, 18% is protein and associated substances, and 60% is water or total body water (TBW).

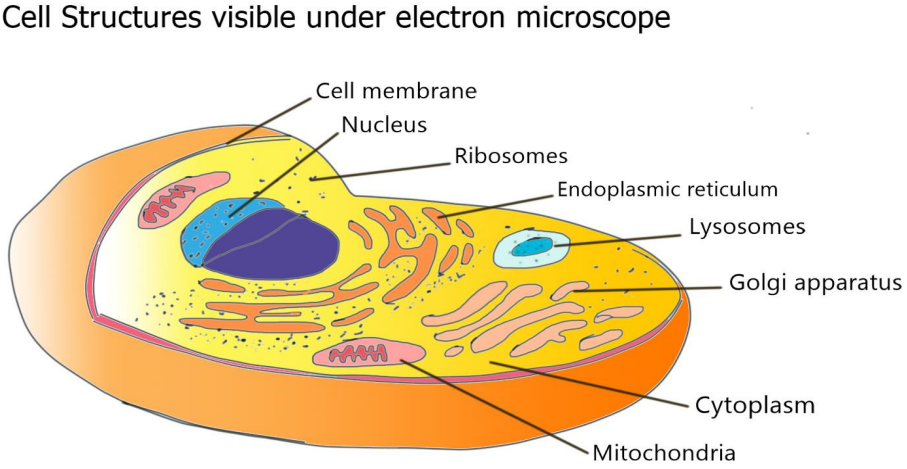


**Fig. (1).** Diagram of cell.

## CARDIOVASCULAR SYSTEM

### Anatomy and Physiology of the Heart

The heart is about the size of our fist. It is located in the middle and slightly to the left side of the thoracic cavity on the diaphragm between 3rd and 5th ribs, and its average weight is about 325 gm in males and about 275 gm in females (Fig. **2**).

The heart has base, apex, and anterior and posterior surfaces. It has four important chambers, namely right and left atrium and right and left ventricle.

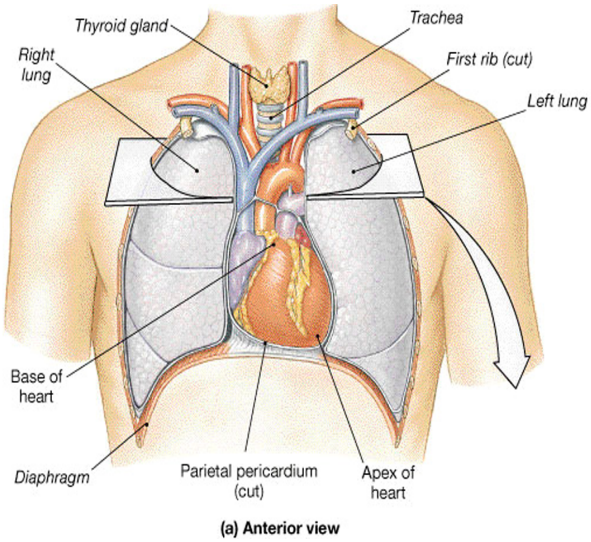


**Fig. (2).** Location of the human heart in the thorax.

## Right Atrium

The right atrium receives venous blood from the whole body through the superior or upper vena cava (SVC) at the higher end, and the inferior or lower vena cava (IVC) at the lower end.Thereafter,it pumps it into the right ventricle (RV) through the tricuspid valve during ventricular diastole (Fig. **3**).

Sino atrial node (SA node) is the natural pacemaker of the heart that generates electrical impulses. Anatomically, it is a collection of modified cardiac cells located on the upper wall of the right atrium.

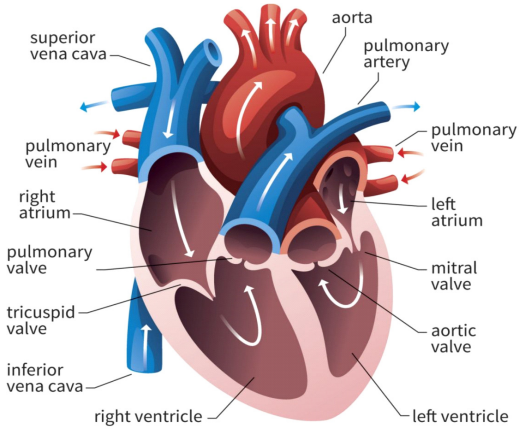


**Fig. (3).** Diagramatic representation of the heart.

**CHAPTER 3**

# Dental Microbiology

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**Abstract:** This chapter introduces the student to oral microbiology. Dental plaque is a known common denominator for caries and periodontal diseases. The colonization of plaque is an important concept. The microbial basis of caries is discussed in this chapter along with gingivitis, periodontics, periimplantitis, and cellulitis.

**Keywords:** Microflora, cocci, Fibrils, Anaerobes, Dental Plaque.

## INTRODUCTION

The mouth has a resident microflora with a characteristic composition comprising bacteria, fungi, protozoa, yeast and occasionally viruses, that coexist with the host. They exist in such harmony that it contributes to the normal functioning and host defense of organisms. They behave as a pathogen when their environment is unbalanced or when microorganisms are found at sites other than their habitat.

Four major categories causing infections of the oral cavity are as follows:

1. Non-specific localized infections, *i.e.*, commensal bacteria, for *e.g.*, dental caries, periodontal disease, and dentoalveolar infectious diseases.
2. Localized infections by specific microorganisms, *e.g.*, actinomycosis and candidiasis.
3. Specific systemic infections with oral manifestations, *e.g.*, syphilis, gonorrhoea, and tuberculosis.
4. Systemic infections without oral symptoms, *e.g.*, infective endocarditis.

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## Oral Flora

The mouth consists of a number of ecological niches, which are colonized by a characteristic mixture of microorganisms which are summarized in Table **1**. The main ecological areas are:

- The tongue.
- Saliva.
- The mucosa of the oral cavity.
- Tooth surface.
- The tonsillar area.
- Dentures, if present.

The resident oral microflora is diverse, attributing to the fact that the mouth is composed of a number of varied habitats that are supplied with diverse nutrients.

**Table 1. Characteristics of main organisms and oral commensals in a tabulated form.**

| Main Characteristics | Species | | Cultural Characteristics | Site and Infections Caused by Organism |
|---|---|---|---|---|
| **Streptococcus (Fig. 1)** Gram-positive cocci in chains, nonmotile, fibrils present usually, capsulate occasionally | Mutans group | **S.mutans (Fig. 2)**<br>S.sobrinus<br>S.ratti<br>S.crecetti | Facultative anaerobes, variable haemolysis<br><br>Selective Medium: mitis salivarius agar (MSA) | Mainly dental plaque/infective endocarditis<br><br>Dental caries and aphthous ulceration<br><br>Tooth surface<br>Tongue<br>Cheek<br>Palate |
| | Salivarius group | S.salivarius<br>S.vestibularis | | |
| | | S.constellatus<br>S.intermedius<br>S.aginosus | | |
| | | S.sanguinis<br>s.gordonii<br>S.parasanguinis<br>S.oralis<br>S.mitis | | |

*(Table 1) cont.....*

| | | | |
|---|---|---|---|
| **Arachnia**<br>Gram-positive pleomorphic bacilli | A. propionica | Strict anaerobe | Dental plaque<br>Dental caries<br>Necrotic dental pulp |
| **Eubacterium**<br>Pleomorphic Gram-positive rods or filaments | E. suburreum | Strict anaerobe | Dental plaque/calculus,carious dentin,and necrotic pulp |
| **Anaerobic streptococcus**<br>Small Gram-positive cocci in chains | Peptococcus spp.<br>Peptostreptococcus spp. | Strict anaerobes, slowly growing, non-hemolytic | Sub-gingival plaque/ dentoalveolar infections |
| **Lactobacillus**<br>Gram-positive bacilli, catalase-negative | L. casei<br>L. fermentum | Microaerophilic; aciduric; optimal pH | Dental plaque in small numbers/extension of dental caries |
| **Actinomyces(Fig.3)**<br>Gram-positive bacilli and filaments, non-motile | A. israelii<br>A. naeslundii<br>A. viscosus | Microaerophilic strict anaerobe,'molar' tooth colony-blood agar<br>Facultative anaerobe<br>Facultative anaerobe with the requirement for $CO_2$ | Dental plaque and tonsillar crypts/actinomycosis and dental calculus formation<br>Dental plaque/root surface caries and calculus formation |
| **Bacterionema**<br>Gram-positive pleomorphic filaments attached to a rectangular rod-shaped body;<br>'whiphandle' appearance | B. matruchotii | Usually facultative anaerobe | Dental plaque/dental calculus formation |
| **Propionibacterium**<br>Gram-positive bacilli | P. acnes | Strict anaerobe, with white colonies surrounded by a dark zone on blood agar | Dental plaque/dentoalveolar infections |
| **Micrococcus and Staphylococcus**<br>Gram-positive cocci, catalase positive | M. mucilaginosus<br>Staph. aureus | Coagulase-negative; large colonies adherent to blood agar surface, facultative<br>coagulase positive; yellow-pigmented colonies | Tongue mainly, also gingival crevice<br>Saliva /Angular cheilitis |

CHAPTER 4

# Dental Pathology

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**Abstract:** The chapter focuses on the dental pathology. It covers the pathology related to teeth and epithelium. Congenital defects of the oral cavity and developmental defects of teeth are also elaborated. It explains inflammation in general with an emphasis on pulp and periapical inflammation and disease. Squamous cell carcinomas are also discussed along with their etiology.

**Keywords:** Developmental Anomalies, Supernumerary, Premalignant Conditions, Carcinoma, Submucous Fibrosis, Granulomatous Disease.

## INTRODUCTION

Among various branches in the dentistry field, one of the finest branches is the dental pathology or oral and maxillofacial pathology, mainly associated with the nature and ide-ntification of pathology related to oral or dental findings histologically and the management of oral-related disorders. Furthermore, it is the science that examines the causes, processes, and effects of these oral-related diseases. The classification of oral pathology as mentioned below (Fig. **1a**).

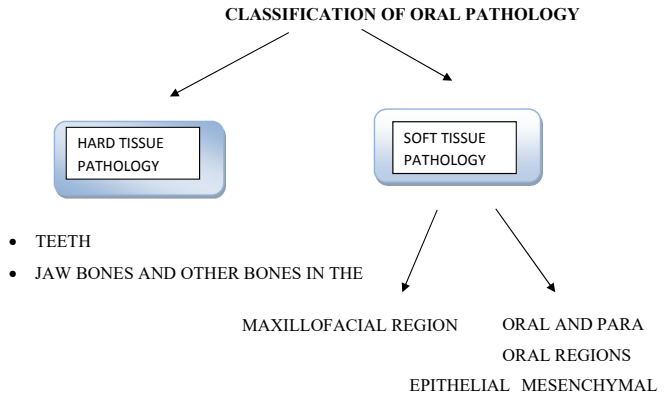


**Fig. (1a).** Classification of oral pathology.

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# DEVELOPMENTAL ANOMALIES OF ORAL AND MAXILLOFACIAL REGION

## 1. Developmental Defects of Lips

### *A). Cleft Lip & Palate*

### ***Clinical Features***

Incidence of isolated cleft palate > females (Figs. **1b** and **2**).

**Fig. (1b).** Cleft palate.

Unesthetic.

Difficulty in feeding, phonation.

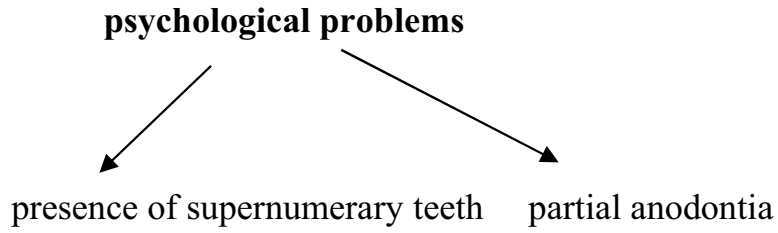
Micrognathia.

Submucous cleft palate.

### *Psychological Problems*

- presence of supernumerary teeth
- partial anodontia

**Fig. (2).** Cleft lip and alveolus.




### *B). Double Lips*

- Fold of excess or unwanted crease of tissue on the mucosal side of the lip.
- More common on the upper lip (Figs. **3a** and **b**).

| CONGENITAL | ACQUIRED |
|---|---|
| • 2-3 months of gestation<br>• Due to persistence of sulcus between embryonic parts of the lip. | • Trauma<br>• Oral habits |

# CHAPTER 5

# Oral and Dental Anatomy

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**Abstract:** The chapter covers the anatomy of the tooth, the oral cavity, enamel, dentine, and pulp. It discusses the arrangement of teeth and also their individual and peculiar anatomical features. Different types of nomenclature used all over the world are discussed. It gives the student an overview of dental anatomy and introduces him to necessary details.

**Keywords:** Oropharynx, Gingiva, Cement-enamel Junction, Histology, Cementoblasts, Pulp, Pulp Horn, Dental Quadrants, Universal Numbering System, Palmer Notation System.

## BASIC ANATOMY OF ORAL CAVITY

### Introduction

The oral cavity is the first portion of the digestive tract and is primarily associated with ingestion, swallowing, and mastication. In addition, the oral cavity plays a role in esthetics, speech, and breathing. The oral cavity is divided into the oral vestibule, present externally to the teeth, and the oral cavity proper, present internally to the teeth. The vestibule and oral cavity proper communicate with each other through the interdental spaces and the space present behind the last molar teeth in the alveolar arch.

## BOUNDARIES OF ORAL CAVITY

The oral cavity extends externally from lips and cheeks to the anterior pillar of fauces internally, where it continues into the oropharynx. It is bounded anteriorly by lips; posteriorly by circumvallate papillae, soft palate, and tonsillar pillars; laterally by cheeks and retromolar regions; inferiorly by mylohyoid muscle, mandibular alveolar ridge, and teeth; and superiorly by the maxillary alveolar ridge, teeth, and hard palate.

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## LOCATION, FUNCTION AND TERMINOLOGY OF STRUCTURES SURROUNDING TEETH

Oral vestibule: It is the narrow slit-like space bounded on one side by the lips and cheeks and on the other side by teeth and alveolus. It can be divided into labial vestibule and buccal vestibule. Labial vestibule is the vestibular space present next to anterior teeth, whereas the vestibular space present next to posterior teeth is known as buccal vestibule.

Cheeks: The cheeks on outer and inner surfaces are covered by skin and mucosa, respectively. Intraorally, cheeks extend anteriorly from the labial commissures to the ridge of mucosa overlying the ascending ramus of the mandible posteriorly. They are bordered superiorly and inferiorly by the upper and lower vestibular fornices. The lining mucosa of the cheek is the non-keratinized stratified squa-mous epithelium, which is tightly adherent to the buccinator muscle.

Floor of mouth: It is a small, horseshoe-shaped region located above the mylohyoid muscle and below the movable part of the tongue. The mucous membrane of the floor of mouth is thin non–keratinized and loosely attached to underlying structures.

Palate: The roof of the oral cavity is formed by the palate. It acts as a partition between oral and nasal cavities. It is divided into an anterior immovable hard palate and a posterior movable soft palate.

Hard palate: The oral surface of the hard palate is covered by masticatory mucosa (keratinized mucosa) that is tightly fixed to the periosteum of the underlying bone. Anoval prominence, the incisive papillae, is present immediately behind the maxillary central incisors. Incisive papillae cover the incisive fossa at the oral opening of the incisive canal. Palatine raphe is a longitudinal ridge that runs posteriorly from the incisive papillae in the midline of the hard palate. Palatine rugae are irregular transverse ridges present on the anterior part of the hard palate. They radiate outwards from the palatine raphe.

Soft palate: It is a movable flap suspended from the posterior margin of the hard palate. The soft palate is a thick fold of mucosa consisting of aponeurosis, muscular tissue, nerves, vessels, mucous glands, and lymphoid tissue. The mucosa of the ante-rior (oral) surface of the soft palate is non-keratinized stratified squamous epithelium.

Tongue: It is a broad, flat muscular organ, which rests on the floor of the mouth within the curved body of the mandible. It plays an important role in mastication, deglutition, speech, and taste. The superior (upper) surface of the tongue is called

the dorsal surface. Shallow V–shaped sulcus called sulcus terminalis divides the dorsum of the tongue into an oral part (anterior two-third) and a pharyngeal part (posterior one-third). The mucosa of the dorsal surface of the tongue is thick, keratinized, and non-keratinized stratified squamous epithelium. The mucosa of the superior surface of the oral portion of the tongue consists of numerous papillae. Some of these papillae have taste buds. There are four types of papillae: filliform, fungiform, circumvallate, and foliate papillae. In humans, the length of foliate papillae varies, and they represent the remnants of large papillae found in many other mammals. Ventral (inferior) surface of the tongue is lined by thin stratified squamous epithelium, which is non-keratinized. A thin sheet of tissue, the lingual frenum, present in the midline attaches the inferior surface of the tongue to the floor of the mouth.

Salivary glands: In human beings are present three pairs of major salivary glands and numerous minor salivary glands. Parotid, submandibular and sublingual salivary glands are the major salivary glands and are present extraorally. Secretions of the major salivary gland reach the oral cavity by means of extended ductal systems. Stensen's duct, the duct of the parotid gland, opens into the oral cavity at a papilla opposite the maxillary second molar. Wharton's duct is the excretory duct of the submandibular gland, which opens into the mouth beneath the tongue at the sublingual caruncle, lateral to the lingual frenum. The secretions of the sublingual gland enter the oral cavity through ducts of Rivinus (a series of small ducts) that open along the sublingual fold and often by Bartholin's duct (a larger duct) that opens at the sublingual caruncle with the submandibular duct. Numerous minor salivary glands (approximately 600-1000 in number) are present as small, discrete clusters of secretory tissue in the submucosa throughout most of the oral cavity except in the anterior part of the hard palate and gingiva.

Gingiva: The gingiva is the part of the oral mucosa that is present around the neck of teeth, extending on the alveolar bone and ending at the mucogingival junction. It can be divided into three parts, interdental papilla, free and attached gingiva. The attached gingiva is directly bound to the tooth and the underlying alveolar bone, whereas free gingiva lies coronal to the attached gingiva and is not bound to the underlying hard tissue. Junction of free and attached gingiva is marked as a free gingival groove. The interdental papilla is the part of the gingiva that fills the space between two adjacent teeth.

## INTRODUCTION TO DENTAL ANATOMY

### Anatomy of Tooth

Anatomically, the tooth is divided into two parts, the crown and the root. Enamel and cementum are the outermost covering of the crown and root of the tooth,

# Introduction to Dental Clinics

# CHAPTER 6

# Dental Radiology

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**Abstract:** The chapter gives an overview of radiology as practiced in a dental clinic. The radiographs are of two types, mainly periapical and bitewing radiographs. The techniques of radiology are explained in this chapter. The deleterious effects of radiation, radiosensitivity of various organs, recommended radiation dose, film speed, and radiation protection gear are discussed for providing an insight to the students.

**Keywords:** Intra-oral Radiographs, Effects of Radiation, Radio-sensitivity, Ionizing Radiation, Film Speed.

## INTRODUCTION

It was in 1895 when X-rays were discovered by Professor Roentgen. Up until 1980, the film was typically used to capture dental radiographs. Direct digital radiography came into existence in the USA in the year 1989, which was invented by Dr. Frances Mouyens back in 1984 and used to take intraoral dental radiographs. Digital radiography occupies an increasingly important place in dentistry. Despite its increasing popularity, radiographs are very commonly used. It is just a matter of time till the complete transition to digital radiograph will take place (Figs. **1**, **2** and **3**).

Two main categories for intraoral dental radiographs exist, *i.e.*, bitewings and periapical. The best diagnostic tool available, bitewing radiographs are used to find out proximal dental caries. It is also important to quantify the alveolar bone level. This is of maximum importance in molar and premolar areas.

If it is necessary to find out the bone level of the anterior teeth, then size 1 bitewing films are appropriate. The periapical X-rays, on the other hand, record the entire crown and root and also the bone around it. They are useful means to

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assess the extent of caries and the periodontal bone remaining. They also are useful to diagnose different bony lesions and root changes.

A combination of the two types of films, namely periapical and bitewing, can be instrumental to conclusively view the entire set of teeth.

One way of making intraoral radiographs is by using digital receptors. Digital receptors are of two types, *i.e.*, wired or rigid sensors. These are computer systems dependent on specific hardware and software. They are of three sizes like films, *i.e.*, 0, 1, and 2. Bitewing radiographs are done at timely intervals based on caries risk criteria. The radiographs are taken on proof of the pattern of disease and the medical and dental history. Clinical manifestations and risk factors are also to be considered.

**Fig. (1).** Wall-mounted intraoral X-ray machine.

**Fig. (2).** Radiograph being taken on the intraoral X-ray machine.

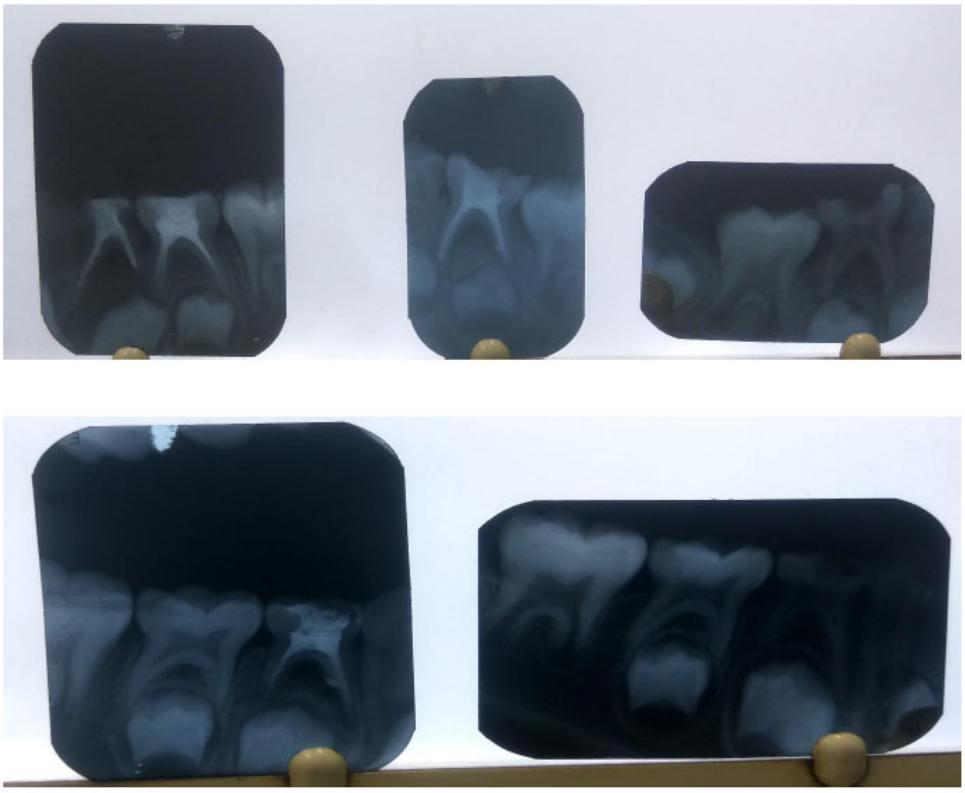

**Fig. (3).** Intraoral periapical radiographic images of mandibular molars: an overview.

CHAPTER 7

# Common Drugs Used in Dental Practice

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**Abstract:** The chapter provides an insight into the common drug therapy practiced in dental clinics for patients. Various routes of administration of drugs are explained. The responsibilities of the patient attendant are highlighted, which is very important and cannot be overlooked, considering the legal liabilities. Most of the important drugs are also described in this chapter.

**Keywords:** Intravenous, Intramuscular, Sublingual, Transdermal, Nasal, Proton pump Inhibitors, Analgesics, Antibiotics, Antifungals.

## INTRODUCTION

Pharmacology is a field of science dealing with drugs. Drugs are an integral part of good dental care. Apart from being used for various dental conditions, they are also used for the management of medical emergencies during dental practice.

## KEY POINTS

- Routes of drug administration
- Understanding of analgesics in dental practice
- Understanding of local anaesthetics in dental practice
- Understanding of antibiotics in dental practice
- Other medications used in dental practice
- Drugs required by dentists for emergencies

## ROUTES OF DRUG ADMINISTRATION

Drugs can be given to a patient by local or systemic routes (Fig. **1**). The choice of the route depends on the properties of the drug and the patient's requirements.

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**Namita Kalra (Ed.)**

**Oral** is the most common, oldest and safest route; **Intravenous** is the most useful in an emergency but risky; and **Topical** is preferred, where possible, because *via* this route, the drug is applied on the site of action, has a faster onset, and exhibits fewer systemic side effects.

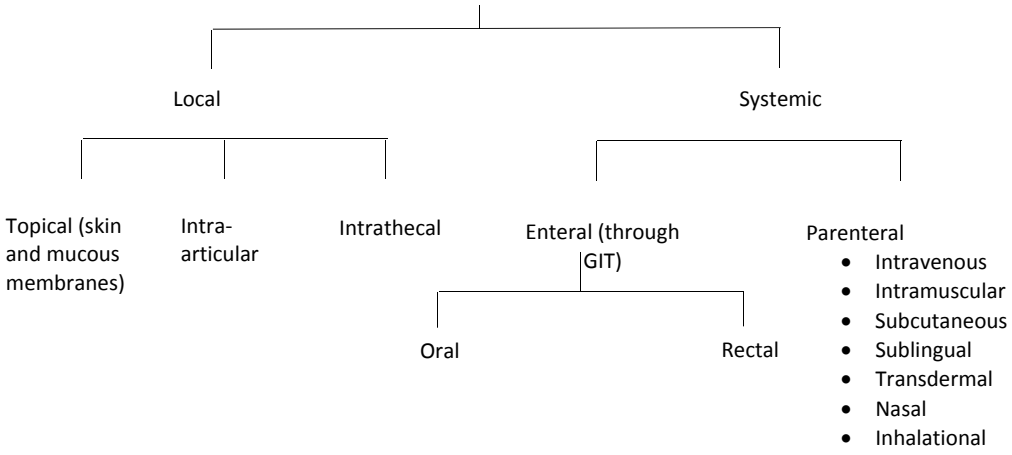


**Fig. (1).** Routes of drug administration.

## Attendant's Responsibilities

The responsibilities of the attendants are defined as follows:

- Ensure that the the correct drug in right doses is administered by the right route.
- History of allergy is to be taken prior to drug administration.
- Drugs should be kept in a safe place.
- Check the drug label, patient's name and prescription before the administration of drugs.

## ANALGESICS

Analgesics are an important class of drugs that are used for the management of acute and chronic pain in dentistry (Table **1**). They are of two types:

- *Non-steroidal anti-inflammatory drugs (NSAIDs) or non-narcotic analgesics*- They ameliorate pain, reduce fever, and decrease inflammation at higher doses. They are commonly used alone in mild to moderate pain. Paracetamol is the safest and most commonly used analgesic.
- *Opioid or narcotic analgesics*- They act centrally on the nervous system to cause pain relief. They are commonly used for moderate to severe pain.

Continued use and abuse of opioids can lead to physical dependence and withdrawal symptoms, so they are reserved for short-term use in moderate to severe pain.

**Table 1. Important features of commonly used analgesics.**

| Drug | Administration Route | Dose | Side Effects |
|---|---|---|---|
| **NSAIDS** | | | |
| Ibuprofen | Oral, topical gel | 400-600 mg | Nausea, vomiting, epigastric pain, ulceration, allergy, skin rashes, urticaria, analgesic nephropathy |
| Diclofenac | Oral, IM, topical gel, transdermal patch | 50-100 mg | |
| Aspirin | Oral | 500 mg | |
| Piroxicam | Oral, IM, topical gel | 20 mg | |
| Ketorolac | Oral, IM, IV, transdermal patch | 10-20 mg | |
| Paracetamol | Oral, IV | 325-1000 mg | Less side effects |
| **Opioids** | | | |
| Hydrocodone | Oral, IM, IV, SC | 10-20 mg | Nausea, vomiting, lightheadedness, sedation, dizziness, constipation, addiction, sleep disorders, respiratory depression |
| Oxycodone | Oral, IM, IV, SC | 5-10 mg | |
| Codeine | Oral | 15-60 mg | |
| Tramadol | Oral, sublingual, IM, IV | 50-100 mg | Less side effects |

IM- intramuscular; IV- intravenous; SC- subcutaneous.

## Attendent's Responsibilities

• Analgesics should be consumed with a full glass of water after meals.

## LOCAL ANAESTHETIC DRUGS

These drugs cause an absence of pain sensation when applied topically or injected around a nerve by blocking nerve conduction. They cause a complete and reversible loss of all sensations in the area supplied by the nerve; thus, they are commonly used for various infiltrative techniques and nerve blocks (Table **2**). They are available in gel, liquid, ointment, patch, and pressurised spray forms.

## Attendent's Responsibilities

- Encourage the patient to spit postoperatively and also to turn and change to an appropriate position to avoid aspiration.
- History of allergy to anaesthetics needs to be taken prior to drug administration.

# CHAPTER 8

# Introduction to Infection Control Practices

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**Abstract:** This chapter explains the various common methods of sterilization used in a dental clinic. It describes the principle of autoclave, ozone steri-lization, cold steri-lization and chemicals used in sterilization. It is of utmost importance for a dental chairside assistant.

**Keywords:** Autoclave, Ozone Sterilization, Radiation for Sterilization, Gluta-raldehyde, Alcohol, Hydrogen Peroxide, Povidone Iodine, Sodium Hypochlorite, Chlorhexidine.

## INTRODUCTION

All procedures that lead to contact with a surgical instrument of a patient's mucous membrane in fact pose a risk to infection. They may involve the presence of microbes and result in infection of otherwise healthy tissue. A lack of proper cleaning and sterilisation of instruments may lead to an infection caused by hospital transmission. For example, a bronchoscope used in a patient with frank tuberculosis will lead to mycobacterium infection in the next patient due to poor or lack of sterilisation. One may transmit disease through contaminated gloves.

Sterilization (or disinfection) could be a term relating to any strategy that dispenses with (expels) or executes (deactivates) a wide range of life and diverse natural species (for example, infections that are caused by organic pathogens), barring prions that cannot be killed, together with transmissible operators (for example, parasites, microbes, infections, prions, spore structures, unicellular eukaryotic living beings like Plasmodium, and so forth) present in an exceedingly such locale, similar to a drug, liquid, surface or any medical compound, like natural culture media.

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Sterilization is to ensure that surgical instruments have 'zero' role in transmitting infection. It is not mandatory to sterilize everything a patient comes into contact with. Hospital protocols decide the sterilisation and disinfection procedure of an area, instrument, and equipment.

The difference between sterilisation and disinfection is that in sterilization, all instruments are made free of microbial living beings in vegetative and spore forms. In disinfection, the organisms may not be totally eliminated. The number is decreased to such a level that they are conducive to the maintenance of health.

## DIFFERENT METHODS OF STERILIZATION USED IN A DENTAL CLINIC

### Autoclave

The principle of an autoclave is that steam above 100 degrees centigrade has more lethal power than dry heat. The saturated steam has more power to penetrate porous material. When steam comes into contact with objects at lower temperature, condensation occurs. When condensation occurs, there is a release of latent heat, and this heat further increases the sterilization action. The conditions become moist, and these moist conditions are more effective for the coagulation of bacterial protein (Fig. **1**).


**Fig. (1).** Autoclave.

## Type of Autoclave

a. Table-top sleek autoclaves are very useful in dental clinics. They are useful for space saving in small areas.
b. Immediate use/flash autoclaves are for quick service in certain situations and operate at a higher pressure and high temperature.
c. Central autoclaves of large size are heavy-duty autoclaves and useful in large dental setups like dental hospitals. They may have a capacity of even up to 1000 litres.

The temperature ranges from 121 to 132 $^0$C in full steam sterilization. It is 170$^0$C for dry heat.

## Parts of an Autoclave

i. Inner chamber that carries the instruments to be sterilized on a perforated sheet.
ii. An outer container of heavy body made of stainless steel or gun metal; generally, a supporting iron case.
iii. The outer cylinder has a lid. This lid is positioned on the outer container like a simple cover, and it is held very tightly using the electric current. The steam, once formed, circulates over the instruments under high pressure. The high pressure ensures deep penetration of steam into porous surfaces, crevices and hinges, and opposing surfaces.
iv. Discharge tap, pressure gauge, and safety valve. These are located on the lid. The pressure gauge indicates steam pressure. The discharge tap is a mechanism for venting out air and steam. The safety valve is a safety device in case of excessive pressure build-up, and it plays its role by creating another exit for steam.

## Working of an Autoclave

The autoclave is filled with water in the outer jacket, and using electrical current, the water is heated and steam is generated. Before this safety valve is adjusted and brought to the desirable pressure reading, initial air and steam mixture is allowed to escape. The discharge gap is closed at this stage to keep the steam in the container. The steam pressure can be measured in the pressure gauge. When the target pressure is achieved, the valve lets out excess steam. Now the countdown begins to the pre-set desired time. Once the time period is over, it is advised to wait for the equalisation of steam pressure with atmospheric pressure. Once again, air from the atmosphere is allowed to enter by opening the discharge tap. At this juncture, the excess water formed due to steam condensation escapes out. This is the correct time to open the lid. Now, the sterilization process is complete.

CHAPTER 9

# Hand Washing

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**Abstract:** The chapter deals with the practice of washing hands and its importance. It is a simple process, and its importance is reinforced. The small act of handwashing is an activity that has been repeatedly shown to be very useful in controlling the spread of nosocomial infections. Eye protection and alcohol-based rubs are also discussed. The use of other protective gear is also stressed.

**Keywords:** Abrasions, Alcohol Rub, Head Cover, Face Masks, Eye-protective Gears.

## IMPORTANCE OF HAND WASHING

The hands may become a common source of cross-infection and risk to patients and to the health worker himself or herself. Hand washing is one of the best methods to control the transfer of germs and bacteria. Special care needs to be given to the following:

a. Hand washing
b. Care of skin abrasion/micro cuts
c. Nail hygiene

### a. Hand Washing

Hand washing must be carried out carefully and meticulously. The detergent used must be gentle and also should have antiseptic properties. Touching the water tap with washed hands should be avoided. There should preferably be a long handle to facilitate using the elbow (Fig. **1**). Electronic sensors for taps are also good methods to eliminate touching the tap. Disposable paper towels or dry air are a good method of drying the hands when compared to conventional towels.

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### b. Care of Skin Abrasions

Care of skin abrasions and micro cuts is very important. Obvious cuts need to be covered with a protective dressing like a band-aid or handiplast. Thereafter, hand washing may be done.

### c. Care of Finger Nails

The fingernails should be well trimmed and kept nicely. They should be washed with a gentle brush during the process of hand washing.

## Method of Hand Washing

### *How to do Hand Washing*

After wetting your hands with running water (warm or cold), use soap to rub your hands and lather them together with the soap. Continue this process for 30 seconds. Wash your hands well using clean water, which is preferably running. Use air or disposable hand towels to dry your hands (Fig. **2**).

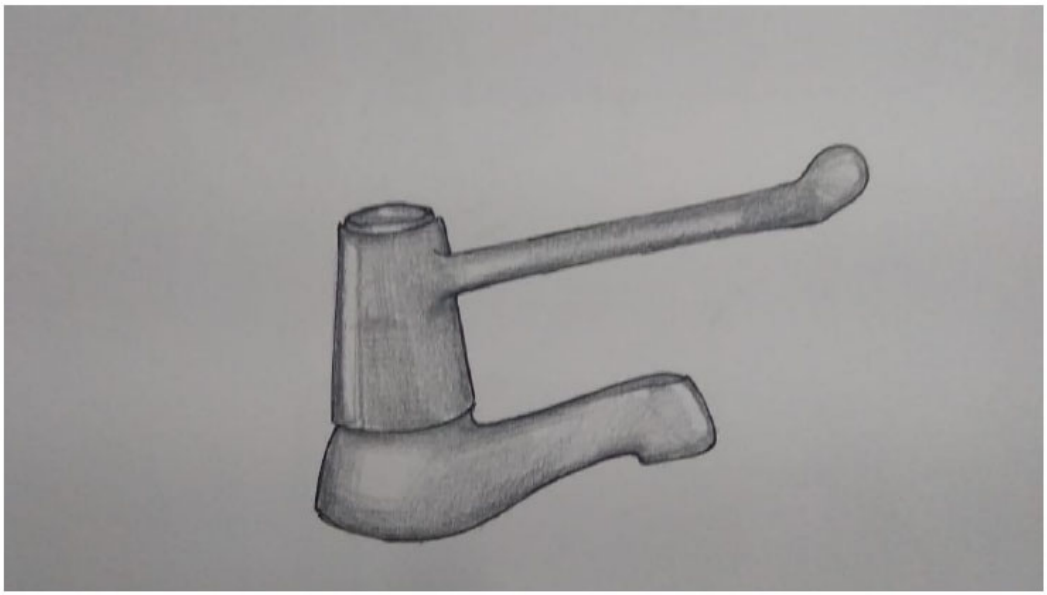

**Fig. (1).** Long handle tap.

**Fig. (2).** Six steps for hand washing.

Handwashing is one of the best ways to control the transfer of germs and bacteria.

## FIVE MOMENTS OF HAND WASHING

Five moments when hand washing is indicated:

i. Prior to touching a patient
ii. Prior to a sterile process in a clinic or lab
iii. If exposed to body fluid
iv. When touching the patient
v. As per WHO recommendations, when touching an area in likely contact with patient surroundings.

CHAPTER 10

# Biomedical Waste Management

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**Abstract:** The chapter deals with the management of waste generated in a dental clinic. It highlights the various steps for its disposal. In this chapter, the types of incinerators are described. Tabulated directions are given on step-by-step recommendations for disposal. It prepares the student for biomedical waste management. It also provides a very important reference for the future dental chair side assistant.

**Keywords:** Sharps, Metallic Implants, Puncture-proof , Mutilation Shredder, Ana-tomical Waste, Soiled Waste.

## INTRODUCTION

Biomedical waste literally means waste generated from medical diagnosis treatment and also includes used gloves, syringes, cotton, gauge, *etc*. It is important to understand biomedical waste management because laxity or carelessness in this matter can give rise to endless cross-infection and disease. Extra precautions are required to manage the spillage of blood and saliva.

### Common Sources of Biomedical Waste in Dental Clinic

The common sources of biomedical waste are as follows:

a. Syringes used to administer local anaesthesia
b. Used gloves
c. Contaminated cotton and gauze
d. Blood
e. Saliva
f. Glassware, like slides and tubes
g. Sharps, like a needle scalpel.
h. Waste plastic applications, like suction tip, plastic applicators, etc.
i. Paper towels, paper bibs for children, rubber dam sheets.

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## Methods of Disposal

The method of disposal is colour coded, and the type of containers are discussed in the tabulated form below (Table **1**):


**Fig. (1).** Yellow container for human anatomical waste, animal anatomical waste, soiled waste, expired medicines, discarded linen, chemical waste, and chemical liquid waste.

**Table 1. Biomedical waste management.**

| Colour of Bag | Type of Waste | Type of Treatment of Waste |
|---|---|---|
| WHITE<br>White refers to leak-proof, tamper-proof, and puncture-proof container<br>Fig. (**4**) | Sharps include - metals | Autoclave<br>or<br>sterilisation using dry heat<br><br>Cutting into pieces or shredding<br>or<br>destroying size and shape or mutilation<br>or<br>putting it in a metal container<br>or<br>autoclaving after cutting into small pieces<br><br>Send to iron foundry for final disposal |

*(Table 1) cont.....*

| Colour of Bag | Type of Waste | Type of Treatment of Waste |
|---|---|---|
| BLUE Fig. (**3**)<br>Blue cardboard box | Glassware metallic body implants | Disinfection<br>or<br>thorough autoclaving<br>or<br>hydro-claving<br>or<br>microwaving sent for final recycling |
| RED Fig. (**2**)<br>Red coloured container or red plastic bag that is chlorine free | Contaminated waste (recyclable) | By high heat in an autoclave<br>or<br>using microwaves and hydroclave<br><br>By cutting into small pieces<br>or<br>cutting into small pieces and then sterilising<br>Above to be sent to a registered recycler |
| YELLOW Fig. (**1**)<br>No chlorinated plastic bag | A. Human anatomical waste<br>B. Expired medicine<br>C. Discarded medicine | Incinerator<br>Deep<br>burial<br>If the above facilities do not exist<br><br>Autoclave/microwave<br>or<br>hydroclave<br>Shredding and mutilation,<br>i.e.,<br>combined method of cutting into small pieces and sterilizing<br>After the above procedures, send waste to energy recovery |
| | D | If there are cytotoxic drugs and other items that are in contact with cytotoxic drugs, then they should be returned to supplier or manufacturer<br>Or<br>BMWTH<br>Or<br>Hazardous waste treatment storage |
| | E | May be incinerated, and alternatively, pyrolysis may be done. Another alternative is to encapsulate it and send it to the facility that deals with hazardous waste |
| | F | Disinfect with chemicals free of chlorine and then use an incinerator to destroy them |
| | G & H | Pre-treat to sterilize with non-chlorinated chemicals on site as per NACO (National Aids Control Organization), followed by incineration |

**CHAPTER 11**

# Dental Materials

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**Abstract:** This chapter will provide an overview of various restorative and impression materials used in a dental practice. The students will be explained how to handle and manipulate various restorative materials and impression materials to attain their ideal properties. Studying this topic is essential as the assistant helps to pace up the restorative appointment by dispensing and mixing the cement bases and restorative materials required while restoring the tooth and impression materials for impression making.

**Keywords:** Dental Amalgam, Dental Composite, Impression Materials, Restorative Materials, Zinc Oxide Eugenol.

## INTRODUCTION

Teeth get damaged due to various reasons, like caries, attrition, erosion and fracture. The damaged tooth is usually repaired by placing some materials in it. These materials are known as restorative or filling materials. Many different varieties of materials are used in dentistry for various purposes.

### The Role of Chairside Assistant

The assistant should be taught about the handling and manipulation of various restorative materials. The assistant helps to speed up the restorative appointment by dispensing and mixing the cement bases and restorative materials required while restoring the tooth. An assistant with sound knowledge of the properties of restorative materials, their prescribed liquid powder ratios, mixing and working times is important for the smooth functioning of the operatory.

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## Types of Restorations

1. Permanent, intermediate and temporary
2. Indirect and direct
3. Esthetic and nonesthetic

*Permanent restorations*: These are the restorations that are supposed to show improved properties and are expected to maintain their integrity from a few months to a few years. Materials used include dental amalgam, direct composite resins, and glass ionomer cement (Type II).

*Intermediate restorations*: These are the restorations that are expected to stay in place from a few weeks to a few months. Materials used include reinforced zinc oxide eugenol cement (IRM), zinc phosphate cement (Type II). They have better properties than temporary restorative materials but are inferior to permanent restorative materials.

*Temporary restorations*: These are the restorations that are supposed to stay in place for a short term, ranging from a few days to a few weeks. Materials used include zinc oxide eugenol cement.

*Direct restorations*: These are the materials used to replace the missing parts of the tooth directly in the oral cavity. These are soft and pliable when mixed and placed and tend to harden later on. Materials used include dental amalgam, direct composites, and GIC (glass ionomer cement).

*Indirect restorations*: These kinds of restorations are usually made outside the oral cavity on models or dies and luted afterwards. Materials used are cast metals, porcelains, and indirect composites.

*Esthetic restorations*: An esthetic restoration is something that is capable of replicating the appearance and colour/shade of the adjacent teeth. Examples are resin-based composites, glass ionomer, and porcelain restorations.

*Nonesthetic restorations*: Nowadays, this term is used for materials that are not able to replicate the appearance and colour/shade of the adjacent teeth. Examples are direct filling gold, dental amalgam, and metal alloys.

## RESTORATIVE MATERIALS

The materials that are used for filling and restoring the tooth are known as restorative materials.

## Types of Restorative Materials

1. *Auxiliary restorative materials*: These materials are used in the prepared cavity for pulp protection and to enhance the bonding ability of the restorative materials to the tooth. For example, dental cements, liners, bases, varnishes and bonding agents.
2. *Restorative materials*: These are used to fill the bulk of the prepared cavity. For example, dental amalgam and direct composite resins.

## DENTAL CEMENTS

Dental cements are generally materials of comparatively low strength with multiple uses. These are used extensively for various purposes, which include restoring/filling, luting/cementing, and therapeutic (Table **1**).

**Table 1. Dental cements.**

| Function of Cements | Explanation | Examples |
|---|---|---|
| **Final cementation** | Cementing/luting of restorations like metal and ceramic crowns and bridges for long term | Zinc phosphate, zinc polycarboxylate, glass ionomer, and resin cement |
| **Temporary cementation** | Used for the crowns and bridges which have to be placed for a short span of time | Zinc oxide eugenol cements |
| **Bases** | Provide mechanical, thermal, chemical, and galvanic insulation to the pulp. These are mixed in thick consistency and applied beneath the restorations. | Zinc polycarboxylate, zinc phosphate, glass ionomer (GIC), zinc oxide eugenol (ZOE) and reinforced ZOE, and calcium hydroxide |
| **Permanent (long-term) restorations** | For filling the complete cavity. Have high strength and low solubility | Glass ionomer, metal modified GIC and compomer |
| **Temporary and intermediate restorations** | For filling the whole cavity. Have decreased strength and high solubility | Zinc oxide eugenol, reinforced zinc oxide eugenol, zinc phosphate, glass ionomer cement |
| **Pulp therapy/capping** | *Direct pulp therapy/capping*: It includes placing a therapeutic agent in direct contact with the exposed pulp with the intent to stimulate the formation of secondary dentin *Indirect pulp capping*: It includes the inducing of secondary dentin formation prior to pulp exposure. | Calcium hydroxide |
| **Obtundant (pain relief)** | Renders obtundant or sedative effect on the pulp. | Zinc oxide eugenol |

CHAPTER 12

# Common Instruments Used in the Dental Clinic

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**Abstract:** The chapter deals with commonly used instruments of various types. It is full of real-life pictures and has the potential to prepare the students for clinical posting to various specialities.

**Keywords:** Curette, Excavator, Extraction Forceps, Periosteal Elevator, Condenser, Plugger, Spatula.

## INTRODUCTION

### Classification of Dental Instruments by Procedural Use

Dental instruments are a vital component of dental practice. Dental personnel, including dentists, hygienists and dental assistants, use a range of devices to clean, extract, repair, and replace teeth.

They provide methods for inspecting, handling, treating, restoring, and extracting teeth and associated oral structures.

### Classification of instruments used in dentistry

The instruments used in dentistry are classified as follows:

- Examination instruments
- Restorative instruments
- Endodontics instruments
- Periodontal instruments
- Prosthodontics instruments
- Orthodontics instruments
- Extractions/surgical instruments

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## *Examination instruments*

### *1. Mouth Mirrors*

During the dentistry procedure, these small mirrors called mouth mirrors are used to allow the dentist to (Fig. **1**):

A. Check the mouth and teeth for cavities or tissue anomalies.
B. Retract the tongue and cheeks of patients to give the dentist a better view of the interior of the mouth.
C. Protect soft tissues from drills and sharp tools during treatment.
D. Enbable the mirror to reflect light into the tooth making it easier to see.

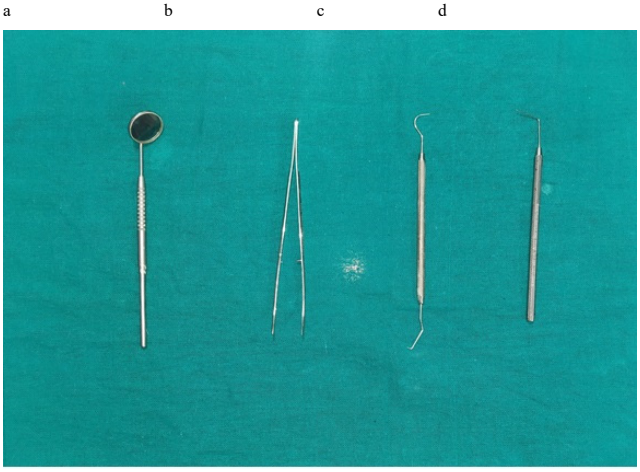


**Fig. (1).** Commonly used dental instruments for examination.

### *2. Probes*

The three main probes found in a basic examination tray are as follows:

I. **Periodontal probes**: These probes are used by the operator or hygienist to:
   - Detect the formation of periodontal pockets.
   - Check the size of the pockets and any lack of attachment to periodontal structures.
   - Detect measurements and evaluate furcation involvement.

II. **Straight probe:** It has one sharp pointed end and is used to check the margins of present fillings or crowns and further to check for caries on the surface of the teeth.

III. **Briault probe**: The briault is a sharp dual-ended tool used to detect tooth decay on the mesial and distal surfaces of the teeth.
   - Mouth mirror
   - Tweezer
   - Explorer
   - Straight probe

### *Restorative Instrument*

These are hand instruments used in the dental setup and may be classified as (Fig. **2**):

- Cutting (chisels, excavators and others)
- Noncutting (mirrors, amalgam condensers, explorers, and probes).

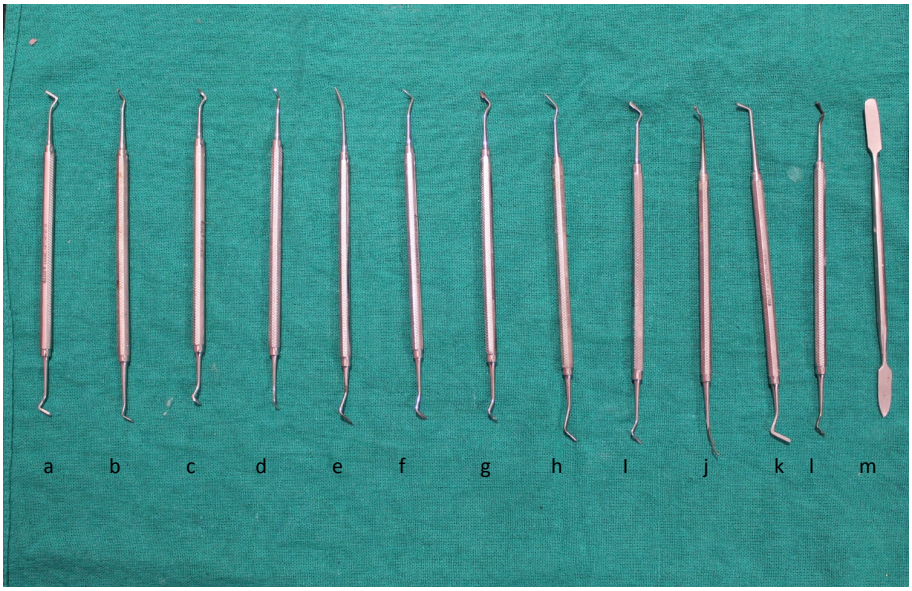


**Fig. (2).** Instruments used in conservative dentistry.

### ***Cutting Instrument***

The cutting instruments are used for cutting tissues of the mouth. These include:

- **Excavators:** The four subclassifications are: (1) ordinary hatchets, (2) hoes, (3) angle formers, and (4) spoons.

The ordinary hatchet excavator has the cutting edge of the blade in the same

CHAPTER 13

# Local Anaesthesia

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**Abstract:** The chapter explains the technique for various blocks used in dentistry. The areas anaesthetized are also well explained. The various techniques discussed are alveolar nerve block, mental nerve block, nasopalatine block, greater palatine block, and posterior superior alveolar block.

**Keywords:** Nerve Block, Insertion, Pulse Oximeter, Automated Blood Pressure Monitor.

## INTRODUCTION

Painless dental treatment is the dream of all patients who are coming to a dentist with a variety of dental problems. Local anesthesia is the most common method being used since decades for pain control. Local anesthesia can be defined as "loss of sensation in a circumscribed area of the body caused by depression of excitation in nerve endings or inhibition of the conduction process in peripheral nerves".

The different injection techniques are used in dentistry for attaining local anesthesia for various dental procedures, like minor surgical procedures (*e.g.*, extraction); endodontic procedures use local infiltration, blocks of following nerves, *i.e.*,

a. alveolar nerve block
b. mental nerve block
c. nasopalatine block
d. greater palatine block
e. posterior superior alveolar nerve block

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A dental chairside assistant should have minimum knowledge about these various techniques and areas to get anesthetized by these techniques so that he/she can assist her fellow dentist effectively.

## Infiltration

It is the most frequently used technique to obtain anesthesia for a single tooth, especially maxillary and mandibular anteriors. This technique is simple and has a high success rate (Fig. **1**).

**Fig. (1).** Infiltration technique.

Anesthetized area: the complete region is supplied by terminal branches (large) of the plexus, including connective tissue, periosteum, periodontal ligament, and mucus membrane.

Procedure: after the preparation of the tissue by cleaning and disinfecting, orient the needle in such a way that the bevel should be towards the bone and keep the syringe in such a way that the long axis of tooth and syringe remain parallel. The needle is pushed in through the mucobuccal fold at the point of reflection adjoining the tooth. Approx. move the needle further till the level is at apex of the

tooth. Now aspirate. If there is no blood, then inject approximately 0.6mL slowly over 20 seconds, and slowly withdraw the syringe.

## Inferior Alveolar Nerve Block (IANB)

When a nerve is administered, four branches get anaesthetized, namely inferior alveolar nerve and lingual nerve. The mental and incisive nerve are also anaesthetized (Fig. **2**).

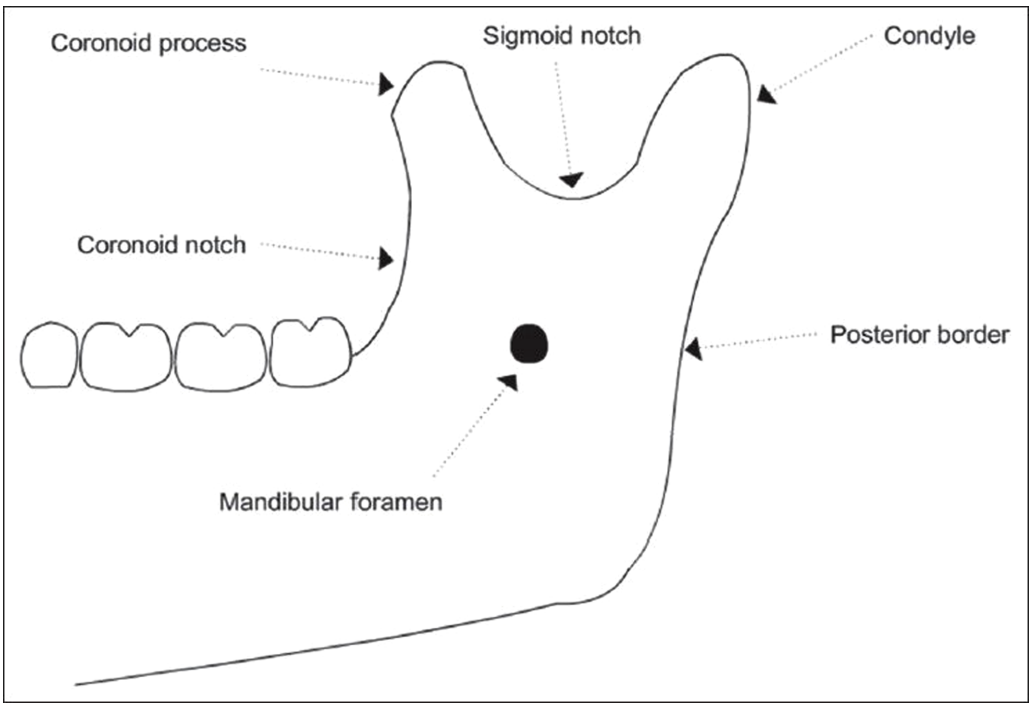


**Fig. (2).** Location of landmarks for conventional inferior alveolar nerve block.

Anesthetized area: The mandibular teeth on the side of injection till midline and buccal mucoperiosteum ahead to mental foramen; the mouth and anterior part of the tongue also lose sensation on the lingual side and periosteum, mandible body and inferiormandibular portion.

### *Procedure*

The most common anesthetic block used by dentists is the lower alveolar nerve block. Despite its significance, a statistic reflecting the highest proportion of all surgical failures accomplished with local anesthesia is correlated with a failure

CHAPTER 14

# Dental Patient Education and Motivation

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**Abstract:** The role of patient education is extremely important in maintaining oral hygiene and oral health. It is even more important when the patient has had a periodontal surgery. Patient education is a simple process if the goals and content of education are understood. Motivation is a rare consequence of this education until additional reinforcement and rewards are used. The subject is discussed in a simple manner in this chapter, and the importance of oral hygiene methods and oral hygiene maintenance is simultaneously discussed.

**Keywords:** Toothbrushing, Bass Method, Charter and Stillman Method, Interdental Brush, Chemical Plaque Control.

## PATIENT EDUCATION AND MOTIVATION

Periodontal diseases can be prevented to a large extent or at least controlled by instituting plaque control measures, identifying and managing plaque-retentive factors, diet counselling, and smoking cessation. Every patient requires a preventive care program based on individual needs. In order to formulate such a plan, it is important to incorporate a step-by-step approach, as detailed below.

### 1. Identify Problem and Assess Individual Needs

All data gathered from the patient's history, clinical and radiographic examination and charting should be reviewed in order to identify existing infection in terms of site and severity along with any risk factors present. In addition, an effort should be made to assess the patient's readiness to learn preventive techniques and any potential barriers (attitude and values), which may hinder compliance.

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**Namita Kalra (Ed.)**

### 2. Formulate Customized Plan

The patient's level of education, socio-economic background, occupation, general mental and physical health along with attitudes towards preventive dental care are the factors to keep in consideration while devising the preventive plan. This helps to note the current oral hygiene regime being followed by the patient and use it as a starting point. Determining dexterity while using oral hygiene implements (maybe hindered by joint problems), age (too young or too old), physical or mental limitations may indicate the need to involve a caregiver to supervise or actively carry out the oral care procedures.

### 3. Communicate, Demonstrate and Reinforce

Introduce all oral hygiene implements deemed necessary for the patient and explain their use in a clear and engaging manner. Audio-visual aids and hands-on demonstrations are usually effective. The patient should also be taught self-evaluation methods (disclosing agents for hidden plaque deposits). Recognize that learning and change in behavior take time and constant reinforcement.

### 4. Monitor Progress

Evaluate oral hygiene status, plaque levels, and tissue health at subsequent appointments. Appreciate positive changes and repeat demonstrations in case the adequate response is not observed.

## AIDS FOR PATIENT EDUCATION AND DEMONSTRATION

### Disclosing Agent

It is a preparation in tablet, liquid or lozenge form used to identify dental plaque deposits for the purpose of oral hygiene assessment, and demonstration of hygiene tools serves as an effective motivational aid for the patient. The use of disclosing agents is based on the fact that dental plaque (which is otherwise not easily visualized) gets stained and retains the dye, while plaque-free oral surfaces lose color immediately on rinsing. It presents a striking visualization of plaque deposits to the patient and enables the identification of sites needing extra attention during personal oral care procedures. Different disclosing agents are available, for example, Skinner's iodine, Bismarck brown, erythrosine, fluorescein, two-tone solution, *etc*.

### *Procedure of Use*

1. Ask the patient to rinse in order to remove excess saliva and food debris.
2. Apply lubricant on lips and any tooth-colored restorations (to prevent staining).
3. Use compressed air for drying teeth.
4. Dispense the required amount of solution in a dappen dish. Apply on all crown surfaces with cotton pellets.
5. If using tablet form, ask the patient to chew it nicely and swish saliva around the mouth for 15-30 seconds. Rinse and evacuate the remaining solution.
6. Observe the presence of plaque and make necessary records on the charting sheet.
7. Provide a hand mirror to the patient so that he/she can see the plaque retentive areas.
8. Demonstrate proper toothbrushing and flossing techniques as suited to the patient's needs.

## MECHANICAL PLAQUE CONTROL

### Toothbrushing

While most of the patients already use the toothbrush for self-care, most are not aware of the correct techniques. While providing instructions to the patient, it is important to emphasize the following points.

1. Toothbrush size and shape: it is recommended that patients select a toothbrush on the basis of adaptability around all tooth surfaces, ability to reach inner areas, and ease of handling. While some toothbrushes might be slightly better at plaque removal, patient preference is important.
2. Method of toothbrushing: there are many different techniques that can be used by patients to perform plaque control. Toothbrushing methods are classified based on the manner of placement of bristles against the tooth and the motion used to activate it. Some of the most commonly employed techniques are Bass or modified Bass, modified Stillman's, Charters, Rolling stroke, and Scrub technique.

## BASS TECHNIQUE (SULCULAR BRUSHING)

Filaments of a soft toothbrush are directed into the gingival sulcus at $45^0$ angle to the long axis of the tooth and activated with a back-and-forth vibratory motion. This technique effectively removes plaque at the gingival margin (Figs. **1** - **4**).

# CHAPTER 15

# Basics of Psychology Related to Patient Management

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**Abstract:** Psychology of human nature and its understanding is the key to smooth interactions between two human beings. It is of great importance to dental surgeons and dental nurses who are dealing with persons in times of distress. These are various theories of developmental psychology given by different authors. The psychosexual theory by an Austrian neurologist Dr. Sigmund Freud and the psychosocial theory by Erik Erikson are the two main theories that explain psychological development and maturity. They have important dental implications, which are discussed in this chapter. The theory of classical conditioning, as given by Ivan Pavlov, a Russian physiologist, is discussed.

**Keywords:** Id, Ego, Superego, Classical Conditioning, Psycho-sexual Theory, Psychosocial Development, Thanatos.

## INTRODUCTION

### Definition

What is Psychology?

Psychology is the science that deals with human nature, function, and the phenomenon of his soul in the main.

### What is the Psychology of the Child Patient?

Child psychology is the science that deals with the mental power or interaction between the conscious and subconscious mind of the child.

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## Why is it Important for the Dental Chairside Assistant to Study this Subject?

- Understanding the child better: for providing a better understanding of how the child functions, thinks and behaves.
- To understand problems of psychological nature: some problems may be diagnosed by the dentist and the team due to prolonged interaction during appointments and should be referred.
- To deliver dental treatment in an effective and meaningful manner: it would enable to increase the efficiency of the treatment provided.
- To establish effective, meaningful communication: it helps to build better dialogue and communication (both verbal and non-verbal) with both child and parents/guardians.
- To gain the confidence of the child and parent: understanding the psychology would instill trust and faith in the dental team.
- To teach the child's parents/guardians the importance of preventive and definitive care: this instills a positive attitude toward dental treatment and encourages a home-care regimen.
- To have better treatment planning and interaction with other disciplines: it will enable a profound case history and make holistic care of the child possible.
- To produce a comfortable environment for dental surgeon and team: it will enable providing a comfortable environment wherein the child remains cooperative during the dental procedure.

## THEORIES OF CHILD PSYCHOLOGY

### Classification

The theories of child psychology are classified broadly into two groups:

#### *Psychodynamic Theories*

- Psychosexual theory by Sigmund Freud – 1905 (Fig. **1**)
- Psychosocial theory by Eric Erickson - 1963
- Cognitive theory by Jean Piaget - 1952

#### *Behaviour Learning Theories*

- Classical conditioning theory by Ivan Pavlov - 1927
- Operant conditioning theory by B. F. Skinner - 1938
- Hierarchy of needs by Maslow - 1954
- Social learning theory by Albert Bandura - 1963

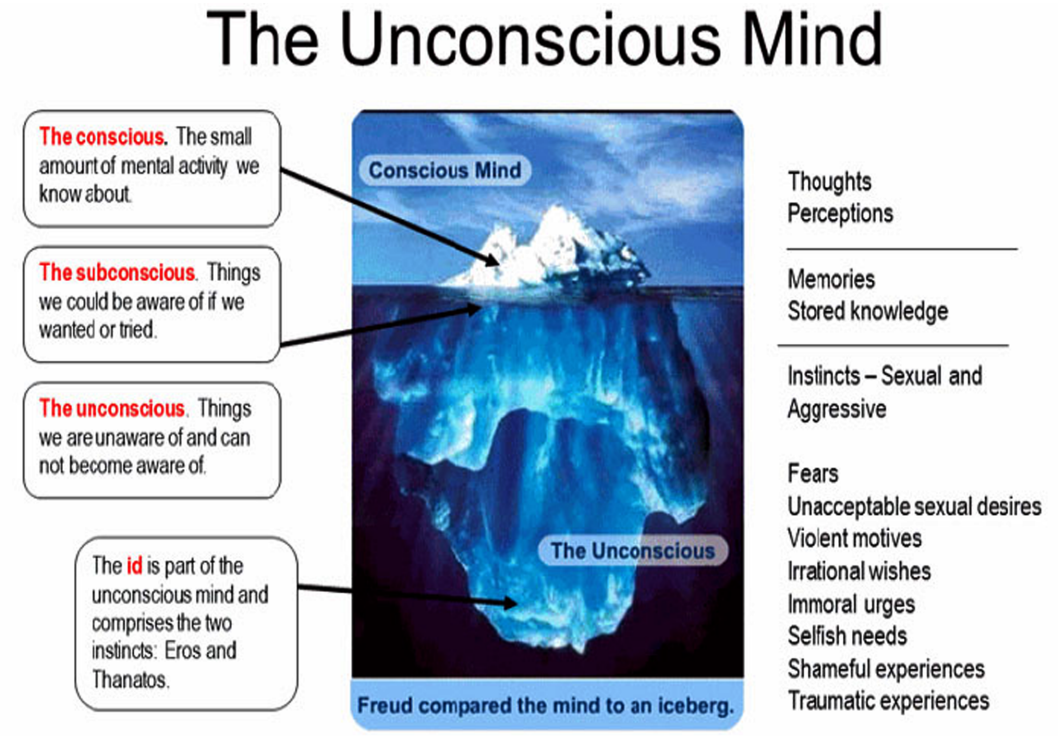


**Fig. (1).** Psychosexual theory by Sigmund Freud.

## THEORIES RELEVANT TO THE CHAIRSIDE ASSISTANT

### Psychoanalytical Theory/Psychosexual Theory

This theory has been described by the Austrian Neurologist Dr. Sigmund Freud in the year 1905.

**Freud's topographic model:** The mind is made up of three elements, *i.e.*, the conscious, sub-conscious, and unconscious mind.

The conscious mind encompasses only <10% of the total mind, whereas the unconscious constitutes 80-90% of the total.

### The Psychid Triad: It is Divided into 3 Parts

o **ID (Fig. 2a)**

o **EGO (Fig. 2b)**

o **SUPER EGO (Fig. 2c)**

CHAPTER 16

# Understanding Anxiety in Dental Patient

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**Abstract:** The chapter is a very important topic of study for the dental chair side assistant. One of the main jobs that he has to perform is of controlling the anxiety of the patient and trying to make the patient more cooperative. There are various types of anxiety, and they may have an association with past experience, or they may be inbuilt. Anxiety needs to be assessed and conveyed. It is important to assess it on a numerical scale and by various physiological tools. Methods of scoring anxiety are discussed for learning how to calculate and communicate the anxiety in our patient. Five self-explanatory real-life pictures are included for the benefit of the student.

**Keywords:** Anxiety, General Anxiety, Electrodermal Activity, Cortisol Concentration, Modified Dental Anxiety Score, Facial Anxiety Score, Anxiety Thermometer, Phobic Patient.

## INTRODUCTION

'Angst' is a German word that was brought to psychology by Freud in 1936. To explain anxiety, some scholars have said that:

- Anxiety is a fear-like emotion, but that it occurs without any objective cause of threat.
- Anxiety is a response to an unknown threat.
- Since anxiety relies on the ability to visualize, it develops after fear.
- Children who have anxiety disorder feel apprehension, nervousness, and introversion, and begin to avoid places and practices.

## DEFINITION

According to Seligman, Walker, and Rosenhan, anxiety is an emotion resulting from inner turmoil that is unpleasant. Nervous behaviour is an associated feature like pacing, complaining, *etc.*

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Types of anxiety include:

### 1. Trait Anxiety

This is an inbuilt trait. It lasts almost throughout life. The concerned individual is generally more fearful. When faced with an anxiety-provoking situation, such a person has an over-response. This over-response is natural for this patient.

### 2. State Anxiety

This is episodic. A somewhat panic-like reaction arises in a particular situation. The reaction to the situation is intense and the reaction lasts as long as the fear-provoking stimulus. The person is filled with fear, and nervousness and may have physical symptoms, like an increase in heart rate and sweating. For example, a young child when faced with an unfamiliar object becomes nervous; when for the first time a person gets on a plane or the first tooth drill in a dental clinic can lead to a lot of anxiety.

### 3. Free Floating Anxiety

Anxiety is a state of repeatedly nervous mood where the source of distress is uncertain, and often other emotions or events induce anxiety.

### 4. Situational Anxiety

This is seen mostly in particular circumstances or events.

### 5. General Anxiety

When a person feels the persistent and recurrent feeling of anxiety, whatever the external factors may be.

### Further Classification of Anxiety

#### *Associated Anxiety*

It is like a condition in which a previously neutral experience is associated or linked with a negative experience and discomfort of other people. Like, for example, when the first dental visit triggers anxiety after what friends have told.

#### *Appraisal*

The disorder affects perception or the way we understand. This includes restoring traumatic memories rather than positive things that give rise to anxiety.

## Causes of Anxiety

### *1. Uncertainty*

Fear of the not known is anxiety-triggering. The anxiety of new patients in dental clinics may be due to the ambiguity they experience about what is waiting for them after the preliminary first appointment.

### *2. Previous Learning*

In these situations, anxiety may be based on the experience of siblings or friends, or other individuals due to their prior personal experience of trauma during the first visit or hearing about dental anxiety. Mother's anxiety plays an important part in child's anxiety and reaction to stressful situations.

### *3. Bio-variation*

There are certain biological variations due to which few persons are likely to be more nervous and have an exaggerated anxiety reaction than others. Some individuals are more likely to become even more nervous or know more about anxiety reactions than others.

## METHODS OF ASSESSING DENTAL ANXIETY

1. Objective Methods

2. Subjective Methods

### 1. Objective Methods

One of the key functions of psychology is to include objective tests to assess a psychological reaction. In view of this, physiological function testing plays a significant role in the area of behavioural assessment.

There are four key quantitative measurements to assess anxiety in children receiving dental treatment. These are as follows:

A. Blood pressure
B. Heart rate
C. Cortisol concentration in saliva
D. Electrodermal activity

# SUBJECT INDEX

## A



## B



## C

## D



## E



## F

## P



## R



## S



## T

## U



## V



## W



## X



## Z

## Namita Kalra

Dr. Namita Kalra has 42 years of experience in dentistry, and more than 38 years of experience in teaching. She has 23 years of experience as a professor. She qualified for BDS with honours in human physiology. For her post-graduate training, she was selected at the prestigious India Institute of AIIMS, Delhi and earned her master's degree for PGIMER, Chandigarh.

Her teaching career started at Dental College Rohtak, Haryana in 1984 and she dedicated herself to paediatric dentistry till 1988. Following this, she set up the Department of Dentistry at the University College of Medical Sciences (UCMS), Delhi under the Delhi University in 1988 and developed general dentistry with special emphasis on geriatric dentistry, dental emergencies, paediatric dentistry and general anaesthesia in dentistry. She also made an initiative to provide services for mentally challenged patients at the Guru Teg Bahadur Hospital, Delhi attached to UCMS. She has been heading the Department from 1988 till date. She also provided post-graduate training in paediatric dentistry at the University College of Medical Sciences (UCMS), Delhi University.

The author has numerous chapters in books to her credit, and almost 106 publications in both national and international indexed journals, with numerous communications at conferences and awards of excellence. She received many awards such as the Common Wealth Academic Staff Fellowship in Paedodontics at the Department of Paediatric Dentistry, University of Glasgow Dental School, Scotland, King's College, London, Distinguished Dental Services by the Delhi State Govt in 2015, the Distinguished Woman of the year in 2021 by the Indian Society of Paedodontics and Preventive Dentistry and also the Best Doctor award in 2014. Recently, she was elected as a Fellow of the National Academy of Medical Sciences in 2021.