

**Faculty of Dentistry (DEN)**

**Syllabi for Bachelor of Dental Surgery (DGEN51)**

**Effective from September 2011**

**Courses offered:**

1. HUMAN ANATOMY, EMBRYOLOGY, HISTOLOGY & MEDICAL GENETICS
2. HUMAN PHYSIOLOGY
3. BIOCHEMISTRY
4. DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY
5. GENERAL PATHOLOGY
6. MICROBIOLOGY
7. GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS
8. DENTAL MATERIALS
9. PRE CLINICAL CONSERVATIVE DENTISTRY LABORATORY EXERCISES
10. PRE CLINICAL PROSTHODONTICS LABORATORY EXERCISES
11. ORAL PATHOLOGY & ORAL MICROBIOLOGY
12. GENERAL MEDICINE
13. GENERAL SURGERY
14. CONSERVATIVE DENTISTRY AND ENDODONTICS
15. ORAL & MAXILLOFACIAL SURGERY
16. ORAL MEDICINE AND RADIOLOGY
17. ORTHODONTICS & DENTAL ORTHOPAEDICS
18. PAEDIATRIC & PREVENTIVE DENTISTRY

**19. PUBLIC HEALTH DENTISTRY**

**20. PERIODONTOLOGY**

**21. PROSTHODONTICS AND CROWN & BRIDGE**

# **1. HUMAN ANATOMY, EMBRYOLOGY, HISTOLOGY & MEDICAL GENETICS**

## **I. INTRODUCTION TO:**

1. Anatomical terms.
2. Skin, superficial fascia & deep fascia
3. Cardiovascular system, portal system collateral circulation and arteries.
4. Lymphatic system, regional lymph nodes
5. Osteology - Including ossification & growth of bones
6. Myology – Including types of muscle tissue & innervation.
7. Syndesmology – Including classification of Joints.
8. Nervous system

## **II. HEAD & NECK:**

01. Scalp, face & temple, lacrimal apparatus
02. Neck - Deep fascia of neck, posterior triangle, suboccipital triangle, anterior triangle, anterior median region of the neck, deep structures in the neck.
03. Cranial cavity - Meninges, parts of brain, ventricles of brain, dural venous sinuses, cranial nerves attached to the brain, pituitary gland.
04. Cranial nerves - III, IV, V, VI, VII, IX, XII in detail.
05. Orbital cavity – Muscles of the eye ball, supports of the eye ball, nerves and vessels in the orbit.
06. Parotid gland.
07. Temporo mandibular joint, muscles of mastication, infratemporal fossa, pterygo - palatine fossa.
08. Submandibular region
09. Walls of the nasal cavity, paranasal air sinuses
10. Palate
11. Oral cavity, Tongue

12. Pharynx (palatine tonsil and the auditory tube) Larynx. OSTEOLOGY – Foetal skull, adult skull, individual bones of the skull, hyoid bone and cervical vertebrae

III. THORAX : Demonstration on a dissected specimen of

1. Thoracic wall
2. Heart chambers
3. Coronary arteries
4. Pericardium
5. Lungs – surfaces ; pleural cavity
6. Diaphragm

IV. ABDOMEN : Demonstration on a dissected specimen of

1. Peritoneal cavity
2. Organs in the abdominal & pelvic cavity.

V. CLINICAL PROCEDURES :

a) Intramuscular injections: Demonstration on a dissected specimen and on a living person of the following sites of injection.

1. Deltoid muscle and its relation to the axillary nerve and radial nerve.
2. Gluteal region and the relation of the sciatic nerve.
3. Vastus lateralis muscle.

b) Intravenous injections & venesection: Demonstration of veins in the dissected specimen and on a living person.

1. Median cubital vein
2. Cephalic vein
3. Basilic vein
4. Long saphenous vein

c) Arterial pulsations: Demonstration of arteries on a dissected specimen and feeling of pulsation of the following arteries on a living person.

1. Superficial temporal
2. Facial
3. Carotid
4. Axillary
5. Brachial
6. Radial
7. Ulnar
8. Femoral
9. Popliteal
10. Dorsalispedis

d) Lumbar puncture: Demonstration on a dissected specimen of the spinal cord, cauda equina & epidural space and the inter vertebral space between L4 & L5 .

#### VI. EMBRYOLOGY :

Oogenesis, Spermatogenesis, Fertilisation, Placenta, Primitive streak, Neural crest, Bilaminar and trilaminar embryonic disc, Intra embryonic mesoderm - formation and fate, notochord formation & fate, Pharyngeal arches, pouches & clefts, Development of face, tongue, palate, thyroid gland, pituitary gland, salivary glands, and anomalies in their development, Tooth development in brief.

#### VII. HISTOLOGY :

The Cell :

Basic tissues - Epithelium, Connective tissue including cartilage and bone, Muscle Tissue,

Nervous tissue : Peripheral nerve, optic nerve, sensory ganglion, motor ganglion, Skin

Classification of Glands

Salivary glands (serous, mucous and mixed gland), Blood vessels, Lymphoid tissue Tooth, lip, tongue, hard palate, oesophagus, stomach, duodenum, ileum, colon, vermiform appendix Liver, Pancreas, Lung, Trachea, Epiglottis, Thyroid gland, para thyroid gland, supra renal gland and pituitary gland, Kidney, Ureter, Urinary bladder, Ovary and testis.

#### VIII. MEDICAL GENETICS :

Mitosis, meiosis, Chromosomes, gene structure, Mendelism, modes of inheritance

### **RECOMMENDED BOOKS:**

1. WILLIAMS, Gray's Anatomy, Ed.38. ,Churchill Livingstone.

2. ROMANES(G.J.). Cunningham Manual of Practical Anatomy: Head & Neck & Brain Ed.15.Vol.III, Oxford Medical publication.

3. WHEATER, BURKITT & DANIELS, Functional Histology, Ed. 2, Churchill Livingstone.

4. SADLER , LANGMAN'S, Medical Embryology, Ed. 6.
5. JAMES E ANDERSON, Grant's Atlas of Anatomy. Williams & Wilkins.
6. EMERY, Medical Genetics.

## **2. HUMAN PHYSIOLOGY:**

### **1. GENERAL PHYSIOLOGY**

1. Homeostasis: Basic concept, Feed back mechanisms
2. Structure of cell membrane, transport across cell membrane
3. Membrane potentials

### **2. BLOOD:**

Composition & functions of blood.

Specific gravity, Packed cell volume, factors affecting & methods of determination.

Plasma proteins - Types, concentration, functions & variations.

Erythrocyte - Morphology, functions & variations. Erythropoiesis & factors affecting erythropoiesis.

ESR- Methods of estimation, factors affecting, variations & significance.

Haemoglobin - Normal concentration, method of determination & variation in concentration.

Blood Indices - MCV, MCH, MCHC - definition, normal values, variation.

Anaemia - Definition, classification, life span of RBC's destruction of RBC's , formation & fate of bile pigments, Jaundice - types.

Leucocytes : Classification, number, percentage, distribution morphology, properties, functions & variation. Role of lymphocytes in immunity , leucopoiesis life span & fate of leucocytes.

Thrombocytes - Morphology, , number, variations, function & thrombopoiesis.

Haemostasis - Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction.

Tests of haemostatic function, platelet count, clotting time, bleeding time, prothrombin time – normal values, method & variations. Anticoagulants - mechanism of action. Bleeding disorders.

Blood groups: ABO & Rh system, method of determination, importance, indications & dangers of blood transfusion, blood substitutes.

Blood volume: Normal values, variations.

Body fluids : distribution of total body water, intracellular & extracellular compartments, major anions & cations in intra and extra cellular fluid.

Tissue fluids & lymph: Formation of tissue fluid, composition, circulation & functions of lymph.

Oedema - causes.

Functions of reticulo endothelial system.

### 3. MUSCLE AND NERVE

Classification of nerves, structure of skeletal muscle - Molecular mechanism of muscle contraction, neuromuscular transmission. Properties of skeletal muscle. Structure and properties of cardiac muscle & smooth muscle.

### 4. DIGESTIVE SYSTEM :

Introduction to digestion : General structure of G.I. tract, Innervation.

Salivary glands: Structure of salivary glands, composition , regulation of secretion & functions of saliva.

Stomach: Composition and functions of gastric juice, mechanism and regulation of gastric secretion.

Exocrine Pancreas - Structure, composition of pancreatic juice, functions of each component, regulation of pancreatic secretion.

Liver : structure , composition of bile, functions of bile, regulation of secretion –

Gall bladder : structure, functions.

Small intestine - Composition, functions & regulation of secretion of intestinal juice.

Large intestine - Functions.

Motor functions of GIT: Mastication, deglutition, gastric filling & emptying, movements of small and large intestine, defecation.

### 5. EXCRETORY SYSTEM :

Structure & functions of kidney, functional unit of kidney & functions of different parts.

Juxta glomerular apparatus, renal blood flow.

Formation of Urine : Glomerular filtration rate - definition, determination , normal values, factors influencing G.F.R. Tubular reabsorption - Reabsorption of sodium, glucose, water & other substances.

Tubular secretion - secretion of urea, hydrogen and other substances.

Mechanism of concentration & dilution of urine.

Role of kidney in the regulation of pH of the blood.



Micturition : anatomy & innervation of Urinary bladder, mechanism of micturition & abnormalities.

## 6. BODY TEMPERATURE & FUNCTIONS OF SKIN

## 7. ENDOCRINOLOGY

General endocrinology - Enumeration of endocrine glands & hormones - General functions of endocrine system, chemistry, mechanism of secretion, transport, metabolism, regulation of secretion of hormones.

Hormones of anterior pituitary & their actions, hypothalamic regulation of anterior pituitary function.

Disorders of secretion of anterior pituitary hormones.

Posterior pituitary : Functions, regulation & disorders of secretion.

Thyroid: Histology, synthesis, secretion & transport of hormones, actions of hormones, regulation of secretion & disorders, Thyroid function tests.

Adrenal cortex & Medulla -synthesis, secretion, action, metabolism, regulation of secretion of hormones & disorders.

Other hormones - Angiotensin, A.N.F.

## 8. REPRODUCTION

Sex differentiation, Physiological anatomy of male and female sex organs,

Female reproductive system : Menstrual cycle, functions of ovary, actions of oestrogen & Progesterone, control of secretion of ovarian hormones, tests for ovulation, fertilisation, implantation, maternal changes during pregnancy, pregnancy tests & parturition.

Lactation, composition of milk, factors controlling lactation, milk ejection, reflex, Male reproductive system :spermatogenesis, semen and contraception.

## 9. CARDIO VASCULAR SYSTEM

Functional anatomy and innervation of heart Properties of cardiac muscle

Origin & propagation of cardiac impulse and heart block.

Electrocardiogram - Normal electrocardiogram. Two changes in ECG in myocardial infarction.

Cardiac cycle - Phases, Pressure changes in atria, ventricles & aorta.

Volume changes in ventricles. Jugular venous pulse, arterial pulse.

Heart sounds: Mention of murmurs.

Heart rate: Normal value, variation & regulation.

Cardiac output: Definition, normal values, one method of determination, variation, factors affecting heart rate and stroke volume.

Arterial blood pressure: Definition, normal values & variations, determinants, regulation & measurement of blood pressure.

Coronary circulation.

Cardio vascular homeostasis - Exercise & posture.

## 10. RESPIRATORY SYSTEM

Physiology of Respiration : External & internal respiration.

Functional anatomy of respiratory passage & lungs.

Respiratory movements: Muscles of respiration, Mechanism of inflation & deflation of lungs.

Intra pleural & intra pulmonary pressures & their changes during the phases of respiration.

Mechanics of breathing - surfactant, compliance & work of breathing.

Spirometry: Lung volumes & capacities definition, normal values, significance, factors affecting vital capacity, variations in vital capacity, FEV & its variations.

Pulmonary ventilation - alveolar ventilation & dead space – ventilation.

Composition of inspired air, alveolar air and expired air.

Exchange of gases: Diffusing capacity, factors affecting it.

Transport of Oxygen & carbon dioxide in the blood.

Regulation of respiration – neural & chemical.

Hypoxia, cyanosis, dyspnoea, periodic breathing.

Artificial respiration, pulmonary function tests.

## 11. CENTRAL NERVOUS SYSTEM

1. Organisation of central nervous system

2. Neuronal organisation at spinal cord level

3. Synapse receptors, reflexes, sensations and tracts

4. Physiology of pain
5. Functions of cerebellum, thalamus, hypothalamus and cerebral cortex.
6. Formation and functions of CSF
7. Autonomic nervous system

## 12. SPECIAL SENSES

Fundamental knowledge of vision, hearing, taste and smell.

### PRACTICALS

The following list of practical is minimum and essential. All the practical have been categorised as procedures and demonstrations. The procedures are to be performed by the students during practical classes to acquire skills. All the procedures are to be included in the University practical examination.

Those categorised as demonstrations are to be shown to the students during practical classes. However these demonstrations would not be included in the University examinations but question based on this would be given in the form of charts, graphs and calculations for interpretation by the students.

### PROCEDURES

1. Enumeration of Red Blood Cells
2. Enumeration of White Blood Cells
3. Differential leucocyte counts
4. Determination of Haemoglobin
5. Determination of blood group
6. Determination of bleeding time and clotting time
7. Examination of pulse
8. Recording of blood pressure.

### DEMONSTRATION:

1. Determination of packed cell volume and erythrocyte sedimentation rate
2. Determination of specific gravity of blood
3. Determination of erythrocyte fragility

4. Determination of vital capacity and timed vital capacity

5. Skeletal muscle experiments.

Study of laboratory appliances in experimental physiology. Frog's gastrocnemius sciatic preparation. Simple muscle curve, effects of two successive stimuli, effects of increasing strength of stimuli, effects of temperature, genesis of fatigue and tetanus. Effect of after load and free load on muscle contraction, calculation of work done.

6. Electrocardiography: Demonstration of recording of normal Electro cardiogram

7. Clinical examination of cardiovascular and respiratory system.

### **RECOMMENDED BOOKS:**

1. Guyton; Text book of Physiology, 9th edition.

2. Ganong; Review of Medical Physiology, 19th edition.

4. Chaterjee; Human Physiology, 10th edition.

5. A.K. Jain; Human Physiology for BDS students, 1st edition.

6. Hutchison's; Clinical Methods, 20th edition.

### **3. BIOCHEMISTRY:**

#### **1. CHEMISTRY OF BIOORGANIC MOLECULES**

Carbohydrates: Definition, biological importance and classification. Monosaccharides - Isomerism, anomerism. Sugar derivatives, Disaccharides. Polysaccharides. Structures of starch and glycogen.

Lipids : Definition, biological importance and classification. Fats and fatty acids. Introduction to compound lipids. Hydrophobic and hydrophilic groups. Cholesterol. Bile salts. Micelle.

Bimolecular leaflet.

Proteins: Biological importance. Aminoacids: Classification. Introduction to peptides. Proteins : Simple and conjugated; globular and fibrous. Charge properties. Buffer action . Introduction to protein conformation . Denaturation.

Nucleic acids: Building units . Nucleotides. Outline structure of DNA and RNA.

High energy compounds: ATP , Phosphorylamidines, Thiolesters, Enol phosphates.

#### **2. MACRONUTRIENTS AND DIGESTION**

Energy needs: Basal metabolic rate. Dietary carbohydrates, fibres. Dietary lipids, essential fatty acids. Nitrogen balance. Essential amino acids. Protein quality and requirement (methods for evaluation of protein quality to be excluded). Protein calorie malnutrition. Balanced diet.

Enzymatic hydrolysis of dietary carbohydrates. Mechanism of uptake of monosaccharides.

Digestion and absorption of triacylglycerols. Enzymatic hydrolysis of dietary proteins and uptake of amino acids.

#### **3. MICRONUTRIENTS**

Vitamins: Definition, classification, daily requirement, sources and deficiency symptoms. Brief account of water-soluble vitamins with biochemical functions. Vitamins A functions including visual process. Vitamin D and its role in calcium metabolism. Vitamin E. Vitamin K and gamma carboxylation. Introduction to antivitamins and hypervitaminosis.

Minerals :Classification, daily requirement. Calcium and phosphate: sources, uptake, excretion, function. Serum calcium regulation. Iron: sources, uptake and transport.

Heme and nonheme iron functions; deficiency. Iodine: Brief introduction to thyroxine synthesis.

General functions of thyroxine. Fluoride: function, deficiency and excess. Indications of role of other minerals.

#### 4. ENERGY METABOLISM

Overview: Outlines of glycolysis, pyruvate oxidation and citric acid cycle. Beta oxidation of fatty acids.

Electron transport chain and oxidative phosphorylation. Ketone body formation and utilisation.

Introduction to glycogenesis, glycogenolysis, fatty acid synthesis, lipogenesis and lipolysis.

Gluconeogenesis. Lactate metabolism . Protein utilisation for energy. Glucogenic and ketogenic amino acids. Integration of metabolism.

#### 5. SPECIAL ASPECTS OF METABOLISM

Importance of pentose phosphate pathway. Formation of glucuronic acid. Outlines of cholesterol synthesis and breakdown. Ammonia metabolism. Urea formation. Phosphocreatine formation.

Transmethylation. Amines. Introduction to other functions of amino acids including one carbon transfer. Detoxication : Typical reactions. Examples of toxic compounds. Oxygen toxicity

#### 6. BIOCHEMICAL GENETICS AND PROTEIN SYNTHESIS

Introduction to nucleotides; formation and degradation. DNA as genetic material. Introduction to replication and transcription. Forms and functions of RNA. Genetic code and mutation. Outline of translation process. Antimetabolites and antibiotics interfering in replication, transcription and translation. Introduction to cancer, viruses and oncogenes.

#### 7. ENZYME AND METABOLIC REGULATION

Enzymes: Definition, classification, specificity and active site. Cofactors. Effect of pH, temperature and substrate concentration. Introduction to enzyme inhibitors, proenzymes and isoenzymes. Introduction to allosteric regulation, covalent modification and regulation by induction/repression.

Overview of hormones. Introduction to second messengers, cyclic AMP, calcium ion, inositol triphosphate. Mechanism of action of steroid hormones, epinephrine, glucagon and insulin in brief.

Acid base regulation. Electrolyte balance.

## 8. STRUCTURAL COMPONENTS AND BLOOD PROTEINS

Connective tissue: Collagen and elastin. Glycosaminoglycans. Bone structure. Structure of membranes. Membrane associated processes in brief. Exocytosis and endocytosis. Introduction to cytoskeleton. Myofibril and muscle contraction in brief.

Haemoglobin: functions. Introduction to heme synthesis and degradation. Plasma proteins: classification and separation. Functions of albumin. A brief account of immunoglobulins. Plasma lipoproteins: Formation, function and turnover.

## 9. MEDICAL BIOCHEMISTRY

Regulation of blood glucose. Diabetes mellitus and related disorders. Evaluation of glycemic status.

Hyperthyroidism and hypothyroidism: Biochemical evaluation. Hyperlipoproteinemias and atherosclerosis, Approaches to treatment. Jaundice: Classification and evaluation. Liver function tests: Plasma protein pattern, serum enzymes levels. Brief introduction to kidney function tests and gastric function tests. Acid base imbalance. Electrolyte imbalance: evaluation. Gout.

Examples of genetic disorders including lysosomal storage disorders, glycogen storage disorders, glucose 6- phosphate dehydrogenase deficiency, hemoglobinopathies, inborn errors of amino acid metabolism and muscular dystrophy ( one or two examples with biochemical basis will be adequate). Serum enzymes in diagnosis.

### PRACTICALS: Contact hours 50

1. Qualitative analysis of carbohydrates	4
2. Color reactions of proteins and amino acids	4
3. Identification of nonprotein nitrogen substance	4
4. Normal constituents of urine	4
5. Abnormal constituents of urine	4
6. Analysis of saliva including amylase	2
7. Analysis of milk Quantitative estimations	2
8. Titrable acidity and ammonia in urine	2

9. Free and total acidity in gastric juice	2
10. Blood glucose estimation	2
11. Serum total protein estimation	2
12. Urine creatinine estimation Demonstration	2
13. Paper electrophoresis charts/clinical data evaluation	2
14. Glucose tolerance test profiles	2
15. Serum lipid profiles	1
16. Profiles of hypothyroidism and hyperthyroidism	1
17. Profiles of hyper and hypoparathyroidism	1
18. Profiles of liver function	1
19. Urea, uric acid creatinine profile in kidney disorders	1
20. Blood gas profile in acidosis/ alkalosis	1

#### **RECOMMENDED BOOKS:**

1. Concise text book of Biochemistry (3rd edition) 2001, T.N. Pattabiraman
2. Nutritional Biochemistry 1995, S. Ramakrishnan and S.V. Rao
3. Text book of Biochemistry with clinical correlations 1997, T.N. Devlin
4. Basic and applied Dental Biochemistry, 1979, R.A.D. Williams & J.C.Elliot.



## **4. DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY**

### **I. TOOTH MORPHOLOGY**

#### **1. Introduction to tooth morphology:**

Human dentition, types of teeth, & functions, Palmer's & Binomial notation systems, tooth surfaces, their junctions - line angles & point angles, definition of terms used in dental morphology, geometric concepts in tooth morphology, contact areas & embrasures - Clinical significance.

#### **2. Morphology of permanent teeth :**

Description of individual teeth, along with their endodontic anatomy & including a note on their chronology of development, differences between similar class of teeth & identification of individual teeth.

Variations & Anomalies commonly seen in individual teeth.

#### **3. Morphology of Deciduous teeth :**

Generalized differences between Deciduous & Permanent teeth.

Description of individual deciduous teeth, including their chronology of development, endodontic anatomy, differences between similar class of teeth & identification of individual teeth.

#### **4. Occlusion :**

Definition, factors influencing occlusion - basal bone, arch, individual teeth, external & internal forces & sequence of eruption.

Inclination of individual teeth - compensatory curves.

Centric relation & Centric occlusion - protrusive, retrusive & lateral occlusion.

Clinical significance of normal occlusion.

Introduction to & Classification of Malocclusion.

### **II. ORAL EMBRYOLOGY**

#### **1. Brief review of development of face, jaws, lip, palate & tongue, with applied aspects.**

#### **2. Development of teeth**

Epithelial mesenchymal interaction, detailed study of different stages of development of crown, root & supporting tissues of tooth & detailed study of formation of calcified tissues.

Applied aspects of disorders in development of teeth.

3. Eruption of deciduous & Permanent teeth :

Mechanisms in tooth eruption, different theories & histology of eruption, formation of dentogingival junction, role of gubernacular cord in eruption of permanent teeth.

Clinical or Applied aspects of disorders of eruption.

4. Shedding of teeth :

Factors & mechanisms of shedding of deciduous teeth.

Complications of shedding.

### III. ORAL HISTOLOGY

1. Detailed microscopic study of Enamel, Dentine, Cementum & Pulp tissue. Age changes & Applied aspects (Clinical and forensic significance) of histological considerations - Fluoride applications, transparent dentine, dentine hypersensitivity, reaction of pulp tissue to varying insults to exposed dentine ; Pulp calcifications & Hypercementosis.

2. Detailed microscopic study of Periodontal ligament & alveolar bone, age changes, histological changes in periodontal ligament & bone in normal & orthodontic tooth movement, applied aspects of alveolar bone resorption.

3. Detailed microscopic study of Oral Mucosa, variation in structure in relation to functional requirements, mechanisms of keratinization, clinical parts of gingiva, Dentogingival & Mucocutaneous junctions & lingual papillae. Age changes & clinical considerations.

4. Salivary Glands :

Detailed microscopic study of acini & ductal system.

Age changes & clinical considerations.

5. TM Joint :

Review of basic anatomical aspects & microscopic study & clinical considerations.

6. Maxillary Sinus :

Microscopic study, anatomical variations, functions & clinical relevance of maxillary sinus in dental practice.

7. Processing of Hard & soft tissues for microscopic study :

Ground sections, decalcified sections & routine staining procedures.

8. Basic histochemical staining patterns of oral tissues.

#### IV. ORAL PHYSIOLOGY

##### 1. Saliva :

Composition of saliva - variations, formation of saliva & mechanisms of secretion, salivary reflexes, brief review of secretomotor pathway, functions, role of saliva in dental caries & applied aspects of hyper & hypo salivation.

##### 2. Mastication :

Masticatory force & its measurement - need for mastication, peculiarities of masticatory muscles, masticatory cycle, masticatory reflexes & neural control of mastication.

##### 3. Deglutition :

Review of the steps in deglutition, swallowing in infants, neural control of deglutition & dysphagia.

##### 4. Calcium, Phosphorous & fluoride metabolism :

Source, requirements, absorption, distribution, functions & excretion, clinical considerations, hypo & hypercalcemia & hyper & hypo phosphatemia & fluorosis.

##### 5. Theories of Mineralization :

Definition, mechanisms, theories & their drawbacks.

Applied aspects of physiology of mineralization, pathological considerations - calculus formation.

##### 6. Physiology of Taste:

Innervation of taste buds & taste pathway, physiologic basis of taste sensation, age changes & applied aspects - taste disorders.

##### 7. Physiology of Speech:

Review of basic anatomy of larynx & vocal cords.

Voice production, resonators, production of vowels & different consonants - Role of palate, teeth & tongue.

Effects of dental prosthesis & appliances on speech & basic speech disorders.

#### **RECOMMENDED TEXT BOOKS**

1. Orban's Oral Histology & Embryology - S.N.Bhaskar

2. Oral Development & Histology - James & Avery

3. Wheeler's Dental Anatomy, Physiology & Occlusion - Major.M.Ash

4. Dental Anatomy - its relevance to dentistry - Woelfel & Scheid
5. Applied Physiology of the mouth - Lavelle
6. Physiology & Biochemistry of the mouth - Jenkins

## **5. GENERAL PATHOLOGY:**

### 1. Introduction to Pathology

Terminologies

The cell in health

The normal cell structure

The cellular functions

### 2. Etiology and Pathogenesis of Disease

Cell Injury

Types – congenital

Acquired

Mainly Acquired causes of disease

(Hypoxic injury, chemical injury, physical injury, immunological injury)

### 3. Degenerations

Amyloidosis

Fatty change

Cloudy swelling

Hyaline change, mucoid degeneration

### 4. Cell death & Necrosis

Apoptosis

Def, causes, features and types of necrosis

Gangrene - Dry, wet, gas

Pathological Calcifications

(Dystrophic and metastatic)

### 5. Inflammation

- Definition, causes types, and features

- Acute inflammation

a. The vascular response

- b. The cellular response
- c. Chemical mediators
- d. The inflammatory cells
- e. Fate

- Chronic inflammation

Granulomatous inflammation

## 6. Healing

- Regeneration

- Repair

- a. Mechanisms

- b. Healing by primary intention

- c. Healing by secondary intention

- d. Fracture healing

- e. Factors influencing healing process

- f. Complications

## 7. Tuberculosis

- Epidemiology

- Pathogenesis (Formation of tubercle)

- Pathological features of Primary and secondary TB

- Complications and Fate

## 8. Syphilis

- Epidemiology

- Types and stages of syphilis

- Pathological features

- Diagnostic criteria

- Oral lesions

## 9. Typhoid

- Epidemiology
- Pathogenesis
- Pathological features
- Diagnostic criterias

#### 10. Thrombosis

- Definition, Pathophysiology
- Formation, complications & Fate of a thrombus

#### 11. Embolism

- Definition
- Types
- Effects

#### 12. Ischaemia and Infraction

- Definition, etiology, types
- Infraction of various organs

#### 13. Derangements of body fluids

- Oedema – pathogenesis

Different types

#### 14. Disorders of circulation

- Hyperaemia
- Shock

#### 15. Nutritional Disorders

- Common Vitamin Deficiencies

#### 16. Immunological mechanisms in disease

- Humoral & cellular immunity

- Hypersensitivity & autoimmunity

17. AIDS and Hepatitis.

18. Hypertension

- Definition, classification

- Pathophysiology

- Effects in various organs

19. Diabetes Mellitus

- Def, Classification, Pathogenesis, Pathology in different organs

20. Adaptive disorders of growth

- Atrophy & Hypertrophy, Hyperplasia, Metaplasia and Dysplasia

21. General Aspects of neoplasia

a. Definition, terminology, classification

b. Differences between benign and malignant neoplasms

c. The neoplastic cell

d. Metastasis

e. Etiology and pathogenesis of neoplasia, Carcinogenesis

f. Tumour biology

g. Oncogenes and anti-oncogenes

h. Diagnosis

i. Precancerous lesions

j. Common specific tumours, Sq papilloma & Ca, Basal cell Ca, Adenoma & Adenocarcinoma, Fibroma & Fibrosarcoma, Lipoma and liposarcoma

B. Systemic Pathology –

22 Anaemias

- Iron Deficiency anaemia, Megaloblastic anaemia



### 23. Leukaemias

- Acute and chronic leukaemias, Diagnosis and clinical features

### 24. Diseases of Lymph nodes

- Hodgkin's disease, Non Hodgkins lymphoma, Metastatic carcinoma

### 25. Diseases of oral cavity

- Lichen planus, Stomatitis, Leukoplakia, Sq cell Ca, Dental caries, Dentigerous cyst, Ameloblastoma

### 26. Diseases of salivary glands

- Normal structure, Sialadenitis, Tumours

### 27. Common diseases of Bones

- Osteomyelitis, Metabolic bone diseases, Bone Tumours, Osteosarcoma, Osteocalstoma, Giant cell Tumour, Ewing's sarcoma, Fibrous dysplasia, Aneurysmal bone cyst

### 28. Diseases of Cardiovascular system

- Cardiac failure
- Congenital heart disease – ASD, VSD, PDA

#### Fallot's Tetralogy

- Infective Endocarditis
- Atherosclerosis
- Ischaemic heart Disease

### 29. Haemorrhagic Disorders

#### Coagulation cascade

#### Coagulation disorders

- Platelet function
- Platelet disorders

## PRACTICALS

1. Urine – Abnormal constituents
  - Sugar, albumin, ketone bodies
2. Urine – Abnormal constituents
  - Blood, bile salts, bile pigments
3. Haemoglobin (Hb) estimation
4. Total WBC count
5. Differential WBC Count
6. Packed cell volume(PCV,) erythrocyte sedimentation Rate (ESR)
7. Bleeding Time & clotting Time
8. Histopathology  
Tissue Processing  
Staining
9. Histopathology slides
  - Acute appendicitis, Granulation tissue, fatty liver
10. Histopathology slides  
CVC lung, CVC liver, Kidney amyloidosis
11. Histopathology slides  
Tuberculosis, Actinomycosis, Rhinosporidiosis
12. Histopathology slides  
Papilloma, Basal cell Ca, Sq cell Ca
13. Histopathology slides  
Osteosarcoma, osteoclastoma, fibrosarcoma
14. Histopathology slides  
Malignant melanoma, Ameloblastoma, Adenoma
15. Histopathology slides  
Mixed parotid tumour, metastatic carcinoma in lymph node

## RECOMMENDED BOOKS:

1. Robbins – Pathologic Basis of Disease Cotran, Kumar, Robbins

2. Anderson's Pathology Vol 1 & 2 Editors – Ivan Damjanov & James Linder
3. Wintrobe's clinical Haematology Lee, Bithell, Foerster, Athens, Lukens

## **6. MICROBIOLOGY:**

### **A. GENERAL MICROBIOLOGY:**

1. History, Introduction, Scope, Aims and Objectives.
2. Morphology and Physiology of bacteria.
3. Detail account of Sterilisation and Disinfection.
4. Brief account of Culture media and Culture techniques.
5. Basic knowledge of selection, collection, transport, processing of clinical Specimens and identification of bacteria.
6. Bacterial Genetics and Drug Resistance in bacteria.

### **B. IMMUNOLOGY:**

1. Infection - Definition, Classification, Source, Mode of transmission and types of Infectious disease.
2. Immunity
3. Structure and functions of Immune system
4. The Complement System
5. Antigen
6. Immunoglobulins - Antibodies - General structure and the role played in defense mechanism of the body.
7. Immune response
8. Antigen - Antibody reactions - with reference to clinical utility.
9. Immuno deficiency disorders - a brief knowledge of various types of immuno deficiency disorders - A sound knowledge of immuno deficiency disorders relevant to dentistry.
10. Hypersensitivity reactions
11. Autoimmune disorders - Basic knowledge of various types - sound knowledge of autoimmune disorders of oral cavity and related structures.
12. Immunology of Transplantation and Malignancy
13. Immunohaematology

### **C. SYSTEMATIC BACTERIOLOGY:**

1. Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus,

Meningococcus – brief account of each coccus - detailed account of mode of spread, laboratory diagnosis, Chemo therapy and prevention - Detailed account of Cariogenic Streptococci.

2. *Corynebacterium diphtheriae* - mode of spread, important clinical feature, Laboratory diagnosis,

Chemotherapy and Active immunisation.

3. Mycobacteria - Tuberculosis and Leprosy

4. *Clostridium* - Gas gangrene, food poisoning and tetanus.

5. Non-sporing Anaerobes - in brief about classification and morphology, in detail about dental pathogens - mechanism of disease production and prevention.

6. Spirochaetes - *Treponema pallidum* - detailed account of Oral Lesions of syphilis, *Borrelia vincentii*.

7. Actinomycetes.

#### D. VIROLOGY:

1. Introduction

2. General properties, cultivation, host - virus interaction with special reference to Interferon.

3. Brief account of Laboratory diagnosis, Chemotherapy and immuno prophylaxis in general.

4. A few viruses of relevance to dentistry.

Herpes Virus

Hepatitis B Virus - brief about other types

Human Immunodeficiency Virus (HIV)

Mumps Virus

Brief - Measles and Rubella Virus

5. Bacteriophage - structure and Significance

#### E. MYCOLOGY

1. Brief Introduction

2. Candidosis - in detail

3. Briefly on oral lesions of systemic mycoses.

#### F. PARASITOLOGY:

1. Brief introduction - protozoans and helminths
2. Brief knowledge about the mode of transmission and prevention of commonly seen parasitic infection in the region.

#### **RECOMMENDED BOOKS:**

1. Text book of Microbiology – R. Ananthanarayan & C.K.Jayaram Paniker.
2. Clinical & Pathogenic Microbiology – Barbara J Howard, et al.
3. Mechanisms of Microbial diseases – Moselio Schaechter, et al.
4. Immunology 3rd edition – Evan Roitt , et al.

## **7. GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS**

### **I. GENERAL PHARMACOLOGY:**

1. General principles of pharmacology; sources and nature of drugs dosage forms; prescription writing; pharmacokinetics (absorption, distribution, metabolism and excretion of drugs), mode of action of drugs, combined effects of drugs, receptor mechanism of drug action, factors modifying drug response, adverse drug reactions; drug interactions, Implications of General Principles in clinical dentistry.
2. CNS drugs; General anaesthetics, hypnotics, analgesics psychotropic drugs, anti – epileptics, muscle relaxants, local anaesthetics, Implications of these drugs in clinical dentistry.
3. Autonomic drugs; sympathomimetics, antiadrenergic drugs parasympathomimetics and parasympatholytics, Implications of Autonomic drugs in clinical dentistry.
4. Cardiovascular drugs; Cardiac stimulants ; antihypertensive drugs, vasopressor agents, treatment of shock, Antianginal agents and diuretics, Implications of these drugs in clinical dentistry.
5. Autocoids:  
Histamine, antihistamines, prostaglandins, leukotriens and bronchodilators, Implications of Autocoids in clinical dentistry.
6. Drugs acting on blood : coagulants and anticoagulants, hematinics, Implications of these drugs in clinical dentistry.
7. G.I.T. Drugs, Purgatives, anti-diarrhoeal, antacids, anti-emetics, Implications of these drugs in clinical dentistry.
8. Endocrines; Emphasis on treatment of diabetes and glucocorticoids, thyroid and antithyroid agents, drugs affecting calcium balance and anabolic steroids, Implications of these drugs in clinical dentistry.
9. Chemotherapy: Antimicrobial agents ( against bacteria, anaerobic infections, fungi, virus and broad spectrum). Infection management in dentistry. Phamacotherapy of Tuberculosis, leprosy and chemotherapy of malignancy in general. Implications of Chemotherapy in clinical dentistry.
10. Vitamins : Water soluble vitamins, Vit. D, Vit.K. and Vit. E, Implications of Vitamins in clinical dentistry.
11. Pharmacotherapy of emergencies in dental office and emergency drugs tray Implications of Pharmacotherapy in clinical dentistry.

12. Chelating agents – BAL, EDTA and desferrioxamine,

## II. DENTAL PHARMACOLOGY

1. Anti - septic, astringents, obtundents, mummifying agents, bleaching agents, styptics, disclosing agents, dentifrices, mouth washes, caries and fluorides.
2. Pharmacotherapy of common oral conditions in dentistry.

### PRACTICALS AND DEMONSTRATIONS:

To familiarise the student with the methodology: prescription writing and dispensing. Rationale of drug combinations of marketed drugs.

### **RECOMMENDED BOOKS:**

1. Bertam G Katzung, Basic and Clinical pharmacology 6th ed. Appleton & Lange 1997.
2. Lauerence D.R. Clinical Pharmacology 8th ed. Churchill Livingstone 1997
3. Satoskar R.S. & Bhandarkar S.D., Pharmacology and Pharmaco Therapeutics part I & part II, 13th Popular Prakashan Bombay 1993.
4. Tripathi K.D., Essentials of Medical Pharmacology 4th ed Jaypee Brothers 1999.



## **8. DENTAL MATERIALS**

1) The dental materials is employed in mechanical procedures including restorative dentistry such as Prosthodontics, endodontics, periodontal, orthodontics and restorative materials. There is scarcely a dental procedure that does not make use of dental materials in one form or another and therefore the application of dental material is not limited to any one branch of dentistry.

Branches such as minor surgery and periodontics require less use of materials but the physical and chemical characters of materials are important in these fields.

The toxic and tissue reaction of dental materials and their durability in the oral cavity where the temperature is between 32 & 37 degree centigrade, and the ingestion of hot or cold food ranges from 0- 70 degree centigrade. The acid an alkalinity of fluids shown pH varies from 4 to 8.5. The load on 1 sq. mm of tooth or restorative materials can reach to a level as high as many kilograms. Thus the biological properties of dental materials cannot be separated from their physical and chemical properties.

### **2). STRUCTURE OF MATTER AND PRINCIPLES OF ADHESION.**

Change of state, inter atomic primary bonds, inter atomic secondary bonds, inter atomic bond distance and bonding energy, thermal energy, crystalline structure, non crystalline structures, diffusion, adhesion and bonding and adhesion to tooth structures.

### **3). IMPORTANT PHYSICAL PROPERTIES APPLICABLE TO DENTAL MATERIALS**

Physical properties are based on laws of mechanics, acoustics, optics, thermodynamics, electricity, magnetism, radiation, atomic structure or nuclear phenomena. Hue, value, chroma and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal conductivity & coefficient of thermal expansion are physical properties based on laws of thermodynamics. Stress, strain, proportional limit, elastic limit yield strength, modulus of elasticity, flexibility, resilience, impact, impact strength, permanent deformation, strength, flexure strength fatigue, static fatigue, toughness, brittleness, ductility & malleability, hardness, abrasion resistance, relaxation, rheology, Thixotropic, creep, static creep, dynamic creep, flow, colour, three dimensional colour – hue, values, chroma, Munsell system, metamersim, fluorescence, physical properties of tooth, stress during mastication

### **4). BIOLOGICAL CONSIDERATIONS IN USE OF DENTAL MATERIALS.**

Materials used are with the knowledge of appreciation of certain biological considerations for use in oral cavity. Requirement of materials with biological compatibility. Classification of

materials from perspective of biological compatibility. eg. contact with soft tissues, affecting vitality of pulp, used for root canal fillings, affecting hard tissues of teeth, laboratory materials that could be accidentally be inhaled or ingested during handling. Hazards associated with materials: pH-affecting pulp, polymers causing chemical irritation, mercury toxicity, etc. Microleakage, Thermal changes, Galvanism, toxic effect of materials. Biological evaluation for systemic toxicity, skin irritation, mutagenicity and carcinogenicity. Disinfection of dental materials for infection control.

#### 5). GYPSUM & GYPSUM PRODUCTS.

Gypsum – its origin, chemical formula, Products manufactured from gypsum.

Dental plaster, Dental stone, Die stone, high strength, high expansion stone.

Application and manufacturing procedure of each, macroscopic and microscopic structure of each . Supplied as and Commercial names.

Chemistry of setting, setting reaction, theories of setting, gauging water, Microscopic structure of set material.

Setting time: working time and setting time, Measurement of setting time and factors controlling setting time .

Setting expansion, Hygroscopic setting expansion – factors affecting each

Strength :wet strength, dry strength, factors affecting strength, tensile strength

Slurry – need and use.

Care of cast.

ADA classification of gypsum products

Description of impression plaster and dental investment

Manipulation including recent methods or advanced methods.

Disinfection : infection control, liquids, sprays, radiation

Method of use of disinfectants

Storage of material – shelf life

#### 6) IMPRESSION MATERIALS USED IN DENTISTRY

Impression plaster, Impression compound, Zinc oxide eugenol impression paste & bite registration paste incl., non eugenol paste, Hydrocolloids, reversible and irreversible,

Elastomeric impression materials. Polysulphide, Condensation silicones, Addition silicones,

Polyether, Visible light cure polyether urethane dimethacrylate, Historical background & development of each impression material,

Definition of impression , Purpose of making impression, Ideal properties required and application of material, Classification as per ADA specification, general & individual impression material.

Application and their uses in different disciplines, Marketed as and their commercial names, Mode of supply & mode of application bulk/wash impression. Composition, chemistry of setting ,Control of setting time , Type of impression trays required, Adhesion to tray, manipulation, instruments & equipments required. Techniques of impression, storage of impression, (Compatibility with cast and die material). Any recent advancements in material and mixing devices. Study of properties: Working time, setting time, flow, accuracy, strength, flexibility, tear strength, dimensional stability, compatibility with cast & die materials incl., electroplating Biological properties: tissue reaction , Shelf life & storage of material, Infection control – disinfection, Advantages & disadvantages of each material.

#### 7). SYNTHETIC RESINS USED IN DENTISTRY.

Historical background and development of material, Denture base materials and their classification and requirement

Classification of resins

Dental resins – requirements of dental resins, applications, polymerisation, polymerisation mechanism stages in addition polymerisation, inhibition of polymerisation, co polymerization, molecular weight, crosslinking, plastixizers, Physical properties of polymers, polymer structures types of resins.

ACRYLIC RESINS:

Mode of polymerisation: Heat activated, Chemically activated, Light activated, Mode of supply, application, composition, polymerisation reaction of each. Technical considerations: Methods of manipulation for each type of resin. Physical properties of denture base resin. Miscellaneous resins & techniques: Repair resins, Relining and rebasing. Short term and long-term soft-liners, temporary crown and bridge resins, Resin impression trays, Tray materials, Resin teeth, materials in maxillofacial prosthesis, Denture cleansers, Infection control in detail, Biological properties and allergic reactions.

RESTORATIVE RESINS:

Historical background, Resin based restorative materials, Unfilled & filled, Composite restorative materials, Mode of supply, Composition, Polymerisation mechanisms: Chemically activated, Light activated, Dual cure: Degree of conversion, Polymerisation shrinkage

Classification of Composites:

Application, composition and properties of each Composites of posterior teeth, Prosthodontics resins for veneering. Biocompatibility – microleakage, pulpal reaction, pulpal protection

Manipulation of composites: Techniques of insertion of Chemically activated, light activated, dual cure Polymerisation,

Finishing and polishing of restoration, Repair of composites Direct bonding Bonding: Need for bonding, Acid - etch technique, Enamel bonding, Dentin bonding agents. Mode of bonding, Bond strength, Sandwich technique its indication and procedure. Extended application for composites: Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlays system – Indirect & direct, Core build up, Orthodontic applications.

8). METAL AND ALLOYS:

Structure and behaviour of metals, Solidification of metals, mechanism of crystallisation amorphous & crystalline. Classification of alloys, Solid solutions, Constitutes or equilibrium phase diagrams: Electric alloys, Physical properties, Peritectic alloys, Solid state reaction other binary systems: Metallography & Heat treatment. Tarnish and corrosion. Definition: causes of corrosion, protection against corrosion.,

Corrosion of dental restorations, clinical significance of galvanic current. Dental Amalgam.

History:

Definition of dental amalgam, application, Alloy classification, manufacture of alloy powder composition - available as.

Amalgamation : setting reaction & resulting structure , properties , Microleakage

Dimensional stability, Strength, Creep, Clinical performance

Manipulation: Selection of alloy, proportioning, mechanism of trituration, condensation, carving & finishing. Effect of dimensional changes, Marginal deterioration., Repair of amalgam, mercury toxicity, mercury hygiene.

DIRECT FILLING GOLD:

Properties of pure gold, mode of adhesion of gold for restoration forms of direct filling gold for using as restorative material

Classification : Gold Foil, Electrolytic precipitate, powdered gold.

Manipulation: Removal of surface impurities and compaction of direct filling gold.

Physical properties of compacted gold, Clinical performance.

#### DENTAL CASTING ALLOYS:

Historical background, desirable properties of casting alloys.

Alternatives to cast metal technology: direct filling gold, amalgam, mercury free condensable intermetallic compound - an alternative to metal casting process. CAD-CAM process for metal & ceramic inlays - without need of impression of teeth or casting procedure, pure titanium, most bio compatible metal which are difficult to cast can be made into crowns with the aid of CAD-CAM technology . Another method of making copings - by copy milling (without casting procedures).

Classification of casting alloys: By function & description.

Recent classification , High noble (HN), Noble (N) and predominantly base metal (PB)

Alloys for crown & bridge, metal ceramic & removable partial denture. Composition, function, constituents and application, each alloy both noble and base metal. Properties of alloys: Melting range, mechanical properties, hardness, elongation, modulus of elasticity, tarnish and corrosion.

Casting shrinkage and compensation of casting shrinkage. Biocompatibility - Handling hazards & precautions of base metal alloys, casting investments used. Heat treatment : Softening & hardening heat treatment. Recycling of metals. Titanium alloys & their application , properties & advantages.

Technical considerations In casting . Heat source, furnaces.

#### 9). DENTAL WAXES INCLUDING INLAY CASTING WAX

Introduction and importance of waxes. Sources of natural waxes and their chemical nature.

Classification of Waxes:

Properties: melting range, thermal expansion, mechanical properties, flow & residual stresses, ductility. Dental Wax: Inlay wax: Mode of supply : Classification & composition, Ideal requirements:

Properties of inlay wax: Flow, thermal properties Wax distortion & its causes.

Manipulation of inlay wax: Instruments & equipment required, including electrically heated instruments metal tips and thermostatically controlled wax baths.

Other waxes: Applications, mode of supply & properties.

Casting Wax, Base plate wax, Processing wax, Boxing wax, Utility wax, Sticky wax, Impression wax for corrective impressions, Bite registration wax.

#### 10). DENTAL CASTING INVESTMENTS.

Definition, requirements, classification

Gypsum bonded - classification. Phosphate bonded, Silica bonded

Mode of Supply: Composition, application, setting mechanism, setting time & factors controlling.

Expansions :Setting expansion, Hygroscopic Setting expansion, & thermal expansion : factors affecting. Properties : Strength, porosity, and fineness & storage. Technical considerations: For Casting procedure, Preparation of die, Wax pattern, spruing, investing, control of shrinkage compensation, wax burnout, and heating the invested ring, casting. Casting machines, source of heat for melting the alloy. Defects in casting.

#### 11). SOLDERING, BRAZING AND WELDING

Need of joining dental appliances, Terms & Definition

Solders: Definition, ideal requirement, types of solders – Soft & hard and their fusion temperature, application. Mode of supply of solders, Composition and selection, Properties.

Tarnish & corrosion resistance mechanical properties, microstructure of soldered joint. Fluxes & Anti fluxes: Definition, Function, Types, commonly used fluxes & their selection Technique of Soldering & Brazing : free hand

soldering and investment, steps and procedure. Welding,: Definition, application, requirements, procedure, weld decay - causes and how to avoid it. Laser welding.

#### WROUGHT BASE METAL ALLOYS

Applications and different alloys used mainly for orthodontics purpose

1. Stainless steel
2. Cobalt chromium nickel
3. Nickel titanium
4. Beta titanium

Properties required for orthodontic wires, working range, springiness, stiffness, resilience, Formability,

ductility, ease of joining, corrosion resistance, stability in oral environment, bio compatibility

Stainless steels: Description, type, composition & properties of each type. Sensitisation & stabilisation ,

Mechanical properties – strength, tensile, yield strength, KHN. Braided & twisted wires their need ,

Solders for stainless steel, Fluxes, Welding

1. Wrought cobalt chromium nickel alloys, composition, allocation, properties, heat treatment, physical properties

2. Nickel – Titanium alloys, shape, memory & super elastic

3. Titanium alloys, application, composition, properties, welding, Corrosion resistance

## 12). DENTAL CEMENTS

Definition & Ideal requirements:

Cements: Silicate, Glass ionomer, metal modified glass ionomer, resin modified glass ionomer, zinc oxide eugenol, modified zinc oxide eugenol, zinc phosphate, zinc silico phosphate, zinc poly carboxylate,

Cavity liners and cement bases, Varnishes Calcium hydroxide, Gutta percha

Application, classification (general and individual ), setting mechanism, mode of supply,

Properties, factors affecting setting, special emphasis on critical procedures of manipulation and protection of cement, mode of adhesion, biomechanism of caries inhibition.

Agents for pulpal protection., Modifications and recent advances, Principles of cementation.

Special emphasis on cavity liners and cement bases and luting agents.

## 13). DENTAL CERAMICS

Historical background & General applications.

Dental ceramics : definition, classification, application, mode of supply, manufacturing procedure, methods of strengthening. Properties of fused ceramic: Strength and factors affecting, modulus of elasticity, surface hardness, wear resistance, thermal properties, specific gravity, chemical stability, esthetic properties, biocompatibility, technical considerations.

Metal Ceramics (PFM): Alloys - Types and composition of alloys. Ceramic - Type and Composition.

Metal Ceramic Bond - Nature of bond. Bonding using electro deposition, foil copings, bonded platinum foil, swaged gold alloy foil coping. Technical considerations for porcelain and porcelain fused metal

restorations. Recent advances - all porcelain restorations, Manganese core, injection moulded, castable ceramics, glass infiltrated alumina core ceramic (In ceram), ceramic veneers, inlays and onlays, and CAD

- CAM ceramic. Chemical attack of ceramic by fluoride. Porcelain furnaces.

#### 14). ABRASION & POLISHING AGENTS

Definition of abrasion and polishing. Need of abrasion and polishing. Types of abrasives:

Finishing, polishing & cleaning. Types of abrasives: Diamond, Emery, aluminium oxides garnet, pumice, Kieselgurh, tripoli, rouge, tin oxide, chalk, chromic oxide, sand, carbides, diamond, zirconium silicate Zinc oxide

#### ABRASIVE ACTION :

Desirable characteristics of an abrasive, Rate of abrasion, Size of particle, pressure and speed.

Grading of abrasive & polishing agents. Binder, Polishing materials & procedures used.

Technical consideration - Material and procedure used for abrasion and polishin Electrolytic polishing and burnishing.

#### 15). DIE AND COUNTER DIE MATERIALS INCLUDING ELECTROFORMING AND ELECTROPOLISHING.

Types – Gypsum products, Electroforming, Epoxy resin, Amalgam.

16). DENTAL IMPLANTS : Evolution of dental implants, types and materials.

17). MECHANICS OF CUTTING : Burs and points.

At the end of the course the student should have the knowledge about the composition, properties, manipulative techniques and their various commercial names. The student should also acquire skills to select and use the materials appropriately for laboratory and clinical use.

#### **RECOMMENDED BOOKS:**

1. Phillips Science of Dental Materials – 10th edn.- Kenneth J. Anusavice
2. Restorative Dental Materials – 10 edn. Robert G.Craig
3. Notes on Dental Materials – E.C. Combe



## 9. PRE CLINICAL CONSERVATIVE DENTISTRY LABORATORY EXERCISES

1. Identification and study of handcutting instruments chisels, gingival margin trimmers, excavators and hatchet.
2. Identification and use of rotary cutting instruments in contra angle hand pieces burs (Micromotor)
3. Preparation class I and extended class I and class II and MOD's and class V amounting to 10 exercises in plaster models.
4. 10 exercises in mounted extracted teeth of following class I, 4 in number class I extended cavities 2, class II 4 in number and Class V 2 in number. Cavity preparation base application matrix and wedge placement restoration with amalgam.
5. Exercises on phantom head models which includes cavity preparation base and varnish application matrix and wedge placement followed by amalgam restoration.

Class I	5
Class I with extension	2
Class II	10
Class II Mods	2
Class V and III for glass ionomers	4
Class V for amalgam	2

6. Polishing of above restorations.
7. Demonstration of Class III and Class V cavity preparation. For composites on extracted tooth completing the restoration.
8. Polishing and finishing of the restoration of composites.
9. Identification and manipulation of varnish bases like Zinc Phosphate, Poly carboxylate, Glass Ionomers, Zinc Oxide, Eugenol cements.
10. Identification and manipulation of various matrices, tooth separators and materials like composites and modified glassionomer cements.
11. Cast Restoration
  1. Preparation of Class II inlay cavity
  2. Fabrication of wax pattern
  3. Sprue for inner attachment investing

4. Investing of wax pattern
5. Finishing and cementing of class II inlay in extracted tooth.
12. Endodontics
  1. Identification of basic endodontic instruments
  2. Coronal access cavity preparation on extracted. Upper central incisors
  3. Determination of working length.
  4. Biomechanical preparation of root canal space of central incisor
  5. Obturation of root canal spaces. Absence of coronal access cavity.
  6. Closure of access cavity

## **10. PRE CLINICAL PROSTHODONTICS LABORATORY EXERCISES**

## **11. ORAL PATHOLOGY & ORAL MICROBIOLOGY**

1. A bird's eye view of the different pathological processes involving the oral cavity & oral cavity involvement in systemic diseases to be brought out. Interrelationship between General Medicine & General Surgery & Oral pathology to be emphasized.
2. Developmental disturbances of teeth, jaws and soft tissues of oral & paraoral region :
  - ∴ Introduction to developmental disturbances - Hereditary, Familial mutation, Hormonal etc. causes to be highlighted.
  - ∴ Developmental disturbances of teeth - Etiopathogenesis, clinical features, radiological features & histopathological features as appropriate :-

The size, shape, number, structure & eruption of teeth & clinical significance of the anomalies to be emphasized.
  - ∴ Forensic Odontology.
  - ∴ Developmental disturbances of jaws - size & shape of the jaws.
  - ∴ Developmental disturbances of oral & paraoral soft tissues - lip & palate - clefts, tongue, gingiva, mouth, salivary glands & face.

### 3. Dental Caries :

• Etiopathogenesis, microbiology, clinical features, diagnosis, histopathology, immunology, prevention of dental caries & its sequelae.

### 4. Pulp & Periapical Pathology & Osteomyelitis.

• Etiopathogenesis & interrelationship, clinical features, microbiology, histopathology & radiological features (as appropriate) of pulp & periapical lesions & osteomyelitis.

• Sequelae of periapical abscess - summary of space infections, systemic complications & significance.

### 5. Periodontal Diseases :

• Etiopathogenesis, microbiology, clinical features, histopathology & radiological features (as appropriate) of gingivitis, gingival enlargements & periodontitis. Basic immunological mechanisms of periodontal disease to be highlighted.

### 6. Microbial infections of oral soft tissues :

• Microbiology, defence mechanisms including immunological aspects, oral manifestations, histopathology and laboratory diagnosis of common bacterial, viral & fungal infections namely :-

Bacterial : Tuberculosis, Syphilis, ANUG & its complications - Cancrum Oris.

Viral : Herpes Simplex, Varicella zoster, Measles, Mumps & HIV infection.

Fungal : Candidal infection. Aphthous Ulcers.

### 7. Common non-inflammatory diseases involving the jaws :

• Etiopathogenesis, clinical features, radiological & laboratory values in diagnosis of :  
Fibrous dysplasia, Cherubism, Osteogenesis Imperfecta, Paget's disease, Cleidocranial dysplasia, Rickets, Achondroplasia, Marfan's syndrome & Down's syndrome.

### 8. Diseases of TM Joint :

• Ankylosis, summary of different types of arthritis & other developmental malformations, traumatic injuries & myofascial pain dysfunction syndrome.

### 9. Cysts of the Oral & Paraoral region :

• Classification, etiopathogenesis, clinical features, histopathology, laboratory & radiological features (as appropriate) of Odontogenic cysts, Non-Odontogenic cysts, Pseudocysts of jaws & soft tissue cysts of oral & paraoral region.

### 10. Tumours of the Oral Cavity :

.. Classification of Odontogenic, Non-Odontogenic & Salivary Gland Tumours.

Etiopathogenesis, clinical features, histopathology, radiological features & laboratory diagnosis (as appropriate) of the following common tumours :-

a) Odontogenic - all lesions.

b) Non-odontogenic

- Benign Epithelial - Papilloma, Keratoacanthoma & Naevi.

- Benign Mesenchymal - Fibroma, Aggressive fibrous lesions, Lipoma, Haemangioma, Lymphangioma, Neurofibroma, Schwannoma, Chondroma, Osteoma & Tori.

- Malignant Epithelial - Basal Cell Carcinoma, Verrucous Carcinoma, Squamous Cell carcinoma & Malignant Melanoma.

- Malignant Mesenchymal - Fibrosarcoma, Osteosarcoma, Giant cell tumour, Chondrosarcoma, Angiosarcoma, Kaposi's sarcoma, Lymphomas, Ewing's sarcoma & Other Reticuloendothelial tumours.

c) Salivary Gland

- Benign Epithelial neoplasms - Pleomorphic Adenoma, Warthin's tumour, & Oncocytoma.

- Malignant Epithelial neoplasms - Adenoid Cystic Carcinoma, Mucoepidermoid Carcinoma, Acinic Cell Carcinoma & Adenocarcinomas.

d) Tumours of Disputed Origin - Congenital Epulis & Granular Cell Myoblastoma.

e) Metastatic tumours - Tumors metastasizing to & from oral cavity & the routes of metastasis.

11. Traumatic, Reactive & Regressive lesions of Oral Cavity :

.. Pyogenic & Giant cell granuloma, exostoses Fibrous Hyperplasia, Traumatic Ulcer & Traumatic Neuroma.

.. Attrition, Abrasion, Erosion, Bruxism, Hypercementosis, Dentinal changes, Pulp calcifications & Resorption of teeth.

.. Radiation effects of oral cavity, summary of Physical & Chemical injuries including allergic reactions of the oral cavity.

.. Healing of Oral wounds & complications - Dry socket.

12. Non neoplastic Salivary Gland Diseases :

.. Sialolithiasis, Sialosis, Sialadenitis, Xerostomia & Ptyalism.

13. Systemic Diseases involving Oral cavity :

•• Brief review & oral manifestations, diagnosis & significance of common Blood, Nutritional, Hormonal & Metabolic diseases of Oral cavity.

#### 14. Mucocutaneous Lesions :

•• Etiopathogenesis, clinical features & histopathology of the following common lesions.

Lichen Planus, Lupus Erythematosus, Pemphigus & Pemphigoid lesions, Erythema Multiforme, Psoriasis, Scleroderma, Ectodermal Dysplasia, Epidermolysis bullosa & White sponge nevus.

#### 15. Diseases of the Nerves :

•• Facial neuralgias - Trigeminal & Glossopharyngeal. VII nerve paralysis, Causalgia.

•• Psychogenic facial pain & Burning mouth syndrome.

#### 16. Pigmentation of Oral & Paraoral region & Discolouration of teeth :

•• causes & clinical manifestations.

#### 17. Diseases of Maxillary Sinus :

•• Traumatic injuries to sinus, Sinusitis, Cysts & Tumours involving antrum.

18. a) ORAL PRECANCER – CANCER; Epidemiology, aetiology, clinical and histopathological features,

TNM classification. Recent advances in diagnosis, management and prevention.

b) Biopsy : Types of biopsy, value of biopsy, cytology, histo chemistry & frozen sections in diagnosis of oral diseases.

#### 19. Principles of Basic Forensic Odontology (Pre-clinical Forensic Odontology):

- Introduction, definition, aims & scope.
- Sex and ethnic (racial) differences in tooth morphology and histological age estimation
- Determination of sex & blood groups from buccal mucosa / saliva.
- Dental DNA methods
- Bite marks, rugae patterns & lip prints.
- Dental importance of poisons and corrosives.
- Overview of forensic medicine and toxicology

#### RECOMMENDED BOOKS

1. A Text Book of Oral Pathology - Shafer, Hine & Levy.

2. Oral Pathology - Clinical Pathologic correlations - Regezi & Sciubba.

3. Oral Pathology - Soames & Southam.

#### 4. Oral Pathology in the Tropics - Prabhu, Wilson, Johnson & Daftary

## 12. GENERAL MEDICINE

### CORE TOPICS (Must Know)

1. Aims of medicine Definitions of signs, symptoms, diagnosis, differential diagnosis treatment & prognosis.

### COLLATERAL TOPICS (Desirable to Know)

2. Infections.

Enteric fever, AIDS, herpes simplex, herpes zoster, syphilis diphtheria. Infectious mononucleosis mumps, measles, rubella, malaria.

3. G.I.T.

Stomatitis, gingival hyperplasia, dysphagia, acid peptic disease, jaundice, acute and chronic hepatitis, cirrhosis of liver ascites.

Diarrhea

Dysentery

Amoebiasis

Malabsorption

4. CVS

Acute rheumatic fever rheumatic valvular heart disease, hypertension, ischemic heart disease, infective endocarditis, common arrhythmias, congenital heart disease, congestive cardiac failure.

5. RS

Pneumonia, COPD, Pulmonary TB, Bronchial asthma

Lung Abscess

Pleural effusion

Pneumothorax  
Bronchiectasis  
Lung cancers.

## 6. Hematology

Anemias, bleeding & clotting disorders, leukemias, lymphomas, agranulocytosis, splenomegaly, oral manifestations of hematologic disorders, generalized Lymphadenopathy.

## 7. Renal System

Acute nephritis  
Nephrotic syndrome  
Renal failure

## 8, Nutrition

Avitaminosis  
Balanced diet  
PEM  
Avitaminosis

## 9. CNS

Facial palsy, facial pain including trigeminal neuralgia, epilepsy, headache including migraine.

- Meningitis
- Examination of comatose patient
- Examination of cranial nerves.

## 10. Endocrines

Diabetes Mellitus Acromegaly, Hypothyroidism, Thyrotoxicosis, Calcium metabolism and parathyroids. Addison's disease, Cushing's syndrome.

## 11. Critical care

Syncope, cardiac arrest, CPR, shock

Ac LVF

ARDS

### **CLINICAL TRAINING:**

The student must be able to take history, do general physical examination (including build, nourishment, pulse, BP, respiration, clubbing, cyanosis, jaundice, lymphadenopathy, oral cavity) and be able to examine CVS, RS and abdomen and facial nerve.

### **RECOMMENDED BOOKS:**

1. Textbook of Medicine. Davidson
2. Textbook of Medicine. Hutchinsonson

## **13. GENERAL SURGERY**

### **1. HISTORY OF SURGERY:**

The development of surgery as a speciality over the years, will give the students an opportunity to know the contributions made by various scientists, teachers and investigators. It will also enable the student to understand the relations of various specialities in the practice of modern surgery.

### **2. GENERAL PRINCIPLES OF SURGERY:**

Introduction to various aspects of surgical principles as related to orodental diseases.

Classification of diseases in general. This will help the student to understand the various diseases, their relevance to routine dental practice.

### **3. WOUNDS:**

Their classification, wound healing, repair, treatment of wounds, medico-legal aspects of accidental wounds and complications of wounds.

### **4. INFLAMMATION:**

Of soft and hard tissues. Causes of inflammation, varieties, treatment and sequelae.

### **5. INFECTIONS:**



Acute and chronic abscess skin infections, cellulitis, carbuncle, and erysepelas. Specific infections such as tetanus, gangrene, syphilis, gonorrhoea, tuberculosis, Actinomycosis, Vincents angina, cancrum oris. Pyaemia, toxæmia and septicaemia.

#### 6. TRANSMISSABLE VIRAL INFECTIONS:

HIV and Hepatitis B with special reference to their prevention and precautions to be taken in treating patients in a carrier state.

#### 7. SHOCK AND HAEMORRHAGE:

Classification, causes, clinical features and management of various types of shock. Syncope, Circulatory collapse. Haemorrhage – different types, causes, clinical features and management. Blood groups, blood transfusion, precautions and complications of blood and their products. Hemophilia's, their transmission, clinical features and management especially in relation to minor dental procedures.

#### 8. TUMOURS, ULCERS, CYSTS, SINUS AND FISTULAE:

Classification, clinical examination and treatment principles in various types of benign and malignant tumours, ulcers, cysts, sinus and fistulae.

#### 9. DISEASES OF LYMPHATIC SYSTEM:

Especially those occurring in head and neck region. Special emphasis on identifying diseases such as tubercular infection, lymphomas, leukaemias, metastatic lymph node diseases.

#### 10. DISEASES OF THE ORAL CAVITY:

Infective and malignant diseases of the oral cavity and oropharynx including salivary glands with special emphasis on preventive aspects of premalignant and malignant diseases of the oral cavity.

#### 11. DISEASES OF LARYNX, NASOPHARYNX:

Infections and tumours affecting these sites. Indications, procedure and complications of tracheostomy.

#### 12. NERVOUS SYSTEM:

Surgical problems associated with nervous system with special reference to the principles of peripheral nerve injuries, their regeneration and principles of treatment. Detailed description of afflictions of facial nerve and its management. Trigeminal neuralgia, its presentation and treatment.

#### 13. FRACTURES:

General principles of fractures, clinical presentation and treatment with additional reference to

newer methods of fracture treatment. Special emphasis on fracture healing and rehabilitation.

#### 14. PRINCIPLES OF OPERATIVE SURGERY:

Principles as applicable to minor surgical procedures including detailed description of asepsis, antiseptics, sterilisation, principles of anaesthesia and principles of tissue replacement.

Knowledge of sutures, drains, diathermy, cryosurgery and use of Laser in surgery.

#### 15. ANOMOLIES OF DEVELOPMENT OF FACE:

Surgical anatomy and development of face. Cleft lip and cleft palate—principles of management.

#### 16. DISEASES OF THYROID AND PARATHYROID:

Surgical anatomy, pathogenesis, clinical features and management of dysfunction of thyroid and parathyroid glands. Malignant diseases of the thyroid—classification, clinical features and management.

#### 17. SWELLINGS OF THE JAW:

Differential diagnosis and management of different types of swellings of the jaw.

#### 18. BIOPSY:

Different types of biopsies routinely used in surgical practice.

Skills to be developed by the end of teaching is to examine a routine swelling, ulcer and other related diseases and to perform minor surgical procedures such as draining an abscess, taking a biopsy etc.

### **RECOMMENDED BOOKS:**

1. Bailey & Love. Short practice of Surgery.
2. SK Das. A manual on Clinical Surgery

## **14. CONSERVATIVE DENTISTRY AND ENDODONTICS**

Definition aims objectives of Conservative Dentistry scope and future of Conservative Dentistry.

### 1. Nomenclature of Dentition:

Tooth numbering systems A.D.A. Zsigmondy Palmer and F.D.I. systems.

### 2. Principles Of Cavity Preparation :

Steps and nomenclature of cavity preparation classification of cavities, nomenclature of floors angles of cavities.

### 3. Dental Caries :

Aetiology, classification clinical features, morphological features, microscopic features, clinical diagnosis and sequel of dental caries.

### 4. Treatment Planning For Operative Dentistry:

Detailed clinical examination , radiographic examination, tooth vitality tests, diagnosis and treatment planning, preparation of the case sheet.

### 5. Gnathological Concepts Of Restoration:

Physiology of occlusion, normal occlusion, Ideal occlusion, mandibular movements and occlusal analysis. Occlusal rehabilitation and restoration.

### 6. Aramamentarium For Cavity Preparation:

General classification of operative instruments, Hand cutting instruments design formula and sharpening of instruments. Rotary cutting instruments dental bur, mechanism of cutting, evaluation of hand piece and speed current concepts of rotary cutting procedures. Sterilisation and maintenance of instruments. Basic instrument tray set up.

### 7. Control of Operating Field:

Light source sterilisation field of operation control of moisture, rubber dam in detail, cotton rolls and anti sialogagues.

### 8. Amalgam Restoration :

Indication contraindication, physical and mechanical properties , clinical behaviour. Cavity preparation for Class I , II, V and III. Step wise procedure for cavity preparation and restoration. Failure of amalgam restoration.

### 9. Pulp Protection :

Liners, varnishes and bases, Zinc phosphate, zinc polycarboxylate, zinc oxide eugenol and glass inomer cements.

10. Anterior Restorations :

Selection of cases, selection of material, step wise procedures for using restorations , silicate ( theory only) glass ionomers, composites, including sandwich restorations and bevels of the same with a note on status of the dentine bonding agents.

11. Direct Filling Gold Restorations :

Types of direct filling gold indications and limitations of cohesive gold. Annealing of gold foil cavity preparation and condensation of gold foils.

12. Preventive Measures In Restorative Practice :

Plaque Control, Pit and fissure sealants dietary measures restorative procedure and periodontal health. Contact and contour of teeth and restorations matrices tooth separation and wedges.

13. Temporisation or Interim Restoration.

14. Pin Amalgam Restoration Indication Contra Indication :

Advantages disadvantages of each types of pin methods of placement use of auto matrix. Failure of pin amalgam restoration.

15. Management Of Deep Carious Lesions Indirect And Direct Pulp Capping.

16. Non Carious Destruction's Tooth Structures Diagnosis and Clinical Management

17. Hyper Sensitive Dentine And Its Management.

18. Cast Restorations

Indications, contra indications, advantages and disadvantages and materials used for same Class II and Class I cavity preparation for inlays fabrication of wax pattern spurring inverting and casting procedures & casting defects.

19. Die Materials And Preparation Of Dies.

20. Gingival Tissue Management For Cast Restoration And Impression Procedures

21. Recent Cavity Modification Amalgam Restoration.

22. Differences between Amalgam And Inlay Cavity preparation with note on all the types of Bevels used for Cast Restoration.

23. Control Of Pain During Operative Procedures.

24. Treatment Planning For Operative Dentistry Detailed Clinical Examination Radiographic Examination

25. Vitality Tests, Diagnosis And Treatment Planning And Preparation Of Case Sheet.

26. Applied Dental Materials.

- a) Biological Considerations.
- b) Evaluation, clinical application and adverse effects of the following materials. Dental cements, Zinc oxide eugenol cements zinc phosphate cements, polycarboxylates glass ionomer cements, silicate cement calcium hydroxides varnishes.
- c) Dental amalgam, technical considerations mercury toxicity mercury hygiene.
- d) Composite, Dentine bonding agents, chemical and light curing composites
- e) Rubber base Imp. Materials
- f) Nobel metal alloys & non noble metal alloys
- g) Investment and die materials
- h) Inlay casting waxes
- i) Dental porcelain
- j) Aesthetic Dentistry

27. Endodontics: introduction definition scope and future of endodontics

28. Clinical diagnostic methods

29. Emergency endodontic procedures

30. Pulpal diseases causes, types and treatment .

31. Periapical diseases: acute periapical abscess, acute periodontal abscess phoeix abscess, chronic alveolar abscess granuloma cysts condensing osteits, external resorption.

32. Vital pulp therapy: indirect and direct pulp capping pulpotomy different types and medicaments used.

33. Apexogenesis and apexification or problems of open apex.

34. Rationale of endodontic treatment case selection indication and contraindications for root canal treatments.

35. Principles of root canal treatment mouth preparation root canal instruments, hand instruments, power driven instruments, standardisation color coding principle of using endodontic instruments. Sterilisation of root canal instruments and materials rubber dam application.

36. Anatomy of the pulp cavity: root canals apical foramen. Anomalies of pulp cavities access cavity preparation of anterior and premolar teeth.

37. Preparation of root canal space . Determination of working length, cleaning and shaping of root canals, irrigating solution chemical aids to instrumentation.

38. Disinfection of root canal space intracanal medicaments, poly antibiotic paste ross mans paste, mummifying agents. Out line of root canal treatment, bacteriological examinations, culture methods.
39. Problems during cleaning and shaping of root canal spaces. Perforation and its management. Broken instruments and its management, management of single and double curved root canals.
40. Methods of cleaning and shaping like step back crown down and conventional methods.
41. Obturation of the root canal system. Requirements of an ideal root canal filling material obturation methods using gutta percha healing after endodontic treatment. Failures in endodontics.
42. Root canal sealers. Ideal properties classification. Manipulation of root canal sealers.
43. post endodontic restoration fabrication and components of post core preparation.
44. smear layer and its importance in endodontics and conservative treatment.
45. discoloured teeth and its management. Bleaching agents, vital and non vital bleaching methods.
46. traumatised teeth classification of fractured teeth. Management of fractured tooth and root. Luxated teeth and its management.
47. endodontic surgeries indication contraindications, pre operative preparation. Pre medication surgical instruments and techniques apicectomy, retrograde filling, post operative sequale terphination hemisection, radiscetomy techniques of tooth reimplantation (both intentional and accidental) endodontic implants.
48. root resorption.
49. emergency endodontic procedures.
50. lasers in conservative endodontics (introduction only) practice management
51. professional association dentist act 1948 and its amendment 1993.
52. duties towards the govt. Like payments of professional tax, income tax.
53. financial management of practice
54. dental material and basic equipment management.
55. Ethics

## 15. ORAL & MAXILLOFACIAL SURGERY

1. Introduction, definition, scope, aims and objectives.
  2. Diagnosis in oral surgery:
    - (A) History taking
    - (B) Clinical examination
    - (C) Investigations.
  3. Principles of infection control and cross-infection control with particular reference to HIV/AIDS and Hepatitis.
  4. Principles of Oral Surgery -
    - a) Asepsis: Definition, measures to prevent introduction of infection during surgery.
      1. Preparation of the patient
      2. Measures to be taken by operator
      3. Sterilisation of instruments - various methods of sterilisation etc.
      4. Surgery set up.
    - b) Painless Surgery:
      1. Pre-anaesthetic considerations. Pre-medication: purpose, drugs used
      2. Anaesthetic considerations -
        - a) Local b) Local with IV sedations
      3. Use of general anaesthetic
    - c) Access:

Intra-oral: Mucoperiosteal flaps, principles, commonly used intra oral incisions.

Bone Removal: Methods of bone removal.

Use of Burs: Advantages & precautions

Bone cutting instruments: Principles of using chisel & osteotome.

Extra-oral: Skin incisions - principles, various extra-oral incision to expose facial skeleton.

      - a) Submandibular
      - b) Pre auricular
      - c) Incision to expose maxilla & orbit
      - d) Bicoronal incision
      - d) Control of haemorrhage during surgery
- Normal Haemostasis

Local measures available to control bleeding

Hypotensive anaesthesia etc.

e) Drainage & Debridement

Purpose of drainage in surgical wounds

Types of drains used

Debridement: purpose, soft tissue & bone debridement.

f) Closure of wounds

Suturing: Principles, suture material, classification, body response to various materials etc.

g) Post operative care

Post operative instructions

Physiology of cold and heat

Control of pain - analgesics

Control of infection - antibiotics

Control of swelling - anti-inflammatory drugs

Long term post operative follow up - significance.

5. Exodontia: General considerations

Ideal Extraction.

Indications for extraction of teeth

Extractions in medically compromised patients.

Methods of extraction -

(a) Forceps or intra-alveolar or closed method.

Principles, types of movement, force etc.

(b) Trans-alveolar, surgical or open method, Indications, surgical procedure.

Dental elevators: uses, classification, principles in the use of elevators, commonly used elevators.

Complications of Exodontia -

Complications during exodontia

Common to both maxilla and mandible.

Post-operative complications -

Prevention and management of complications.

6. Impacted teeth:

Incidence, definition, aetiology.



(a) Impacted mandibular third molar.

Classification, reasons for removal,

Assessment - both clinical & radiological

Surgical procedures for removal.

Complications during and after removal,

Prevention and management.

(b) Maxillary third molar,

Indications for removal, classification,

Surgical procedure for removal.

(c) Impacted maxillary canine

Reasons for canine impaction,

Localization, indications for removal,

Methods of management, labial and palatal approach,

Surgical exposure, transplantation, removal etc.

7. Pre-prosthetic Surgery:

Definition, classification of procedures

(a) Corrective procedures: Alveoloplasty,

Reduction of maxillary tuberosities,

Frenectomies and removal of tori.

(b) Ridge extension or Sulcus extension procedures

Indications and various surgical procedures

(c) Ridge augmentation and reconstruction.

Indications, use of bone grafts, Hydroxyapatite

Implants - concept of osseointegration

Knowledge of various types of implants and surgical procedure to place implants.

8. Diseases of the maxillary sinus

Surgical anatomy of the sinus.

Sinusitis both acute and chronic

Surgical approach of sinus - Caldwell-Luc procedure

Removal of root from the sinus.

Oro-antral fistula - aetiology, clinical features and various surgical methods for closure.

## 9. Disorders of T.M. Joint

Applied surgical anatomy of the joint.

Dislocation - Types, aetiology, clinical features and management.

Ankylosis - Definition, aetiology, clinical features and management

Myo-facial pain dysfunction syndrome, aetiology, clinical features, management-

Non surgical and surgical.

Internal derangement of the joint.

Arthritis of T.M. Joint.

## 10. Infections of the Oral cavity

Introduction, factors responsible for infection, course of odontogenic infections, spread of odontogenic infections through various facial spaces.

Dento-alveolar abscess - aetiology, clinical features and management.

Osteomyelitis of the jaws - definition, aetiology, pre-disposing factors, classification, clinical features and management.

Ludwigs angina - definition, aetiology, clinical features, management and complications.

## 11. Benign cystic lesions of the jaws -

Definition, classification, pathogenesis.

Diagnosis - Clinical features, radiological, aspiration biopsy, use of contrast media and histopathology.

Management - Types of surgical procedures, Rationale of the techniques, indications, procedures, complications etc.

## 12. Tumours of the Oral cavity -

General considerations

Non odontogenetic benign tumours occurring in oral cavity - fibroma, papilloma, lipoma, ossifying fibroma, myxoma etc.

Ameloblastoma - Clinical features, radiological appearance and methods of management.

Carcinoma of the oral cavity -

Biopsy - types

TNM classification.

Outline of management of squamous

Cell carcinoma: surgery, radiation and chemotherapy

Role of dental surgeons in the prevention and early detection of oral cancer.

13. Fractures of the jaws -

General considerations, types of fractures, aetiology, clinical features and general principles of management.

mandibular fractures - Applied anatomy, classification.

Diagnosis - Clinical and radiological

Management - Reduction closed and open

Fixation and immobilisation methods

Outline of rigid and semi-rigid internal fixation.

Fractures of the condyle - aetiology, classification, clinical features, principles of management.

Fractures of the middle third of the face.

Definition of the mid face, applied surgical anatomy, classification, clinical features and outline of management.

Alveolar fractures - methods of management

Fractures of the Zygomatic complex

Classification, clinical features, indications for treatment, various methods of reduction and fixation.

Complications of fractures - delayed union, non-union and malunion.

14. Salivary gland diseases -

Diagnosis of salivary gland diseases'

Sialography, contrast media, procedure.

Infections of the salivary glands

Sialolithiasis - Sub mandibular duct and gland and parotid duct.

Clinical features, management.

Salivary fistulae

Common tumours of salivary glands like Pleomorphic adenoma including minor salivary glands.

15. Jaw deformities -

Basic forms - Prognathism, Retrognathism and open bite.

Reasons for correction.

Outline of surgical methods carried out on mandible and maxilla.

## 16. Neurological disorders -

Trigeminal neuralgia - definition, aetiology, clinical features and methods of management including surgical.

Facial paralysis - Aetiology, clinical features.

Nerve injuries - Classification, neurolysis etc.

## 17. Cleft Lip and Palate -

Aetiology of the clefts, incidence, classification, role of dental surgeon in the management of cleft patients. Outline of the closure procedures.

## 18. Medical Emergencies in dental practice –

Primary care of medical emergencies in dental practice particularly -

(a) Cardio vascular (b) Respiratory (c) Endocrine

(d) Anaphylactic reaction (e) Epilepsy (f) Epilepsy

## 19. Emergency drugs & Intra muscular I.V. Injections -

Applied anatomy, Ideal location for giving these injections, techniques etc.

## 20. Oral Implantology

## 21. Ethics

## LOCAL ANAESTHESIA:

Introduction, concept of L.A., classification of local anaesthetic agents, ideal requirements, mode of action, types of local anaesthesia, complications.

Use of Vaso constrictors in local anaesthetic solution -

Advantages, contra-indications, various vaso constrictors used.

Anaesthesia of the mandible -

Pterygomandibular space - boundaries, contents etc.

Inferior Dental Nerve Block - various techniques

Complications

Mental foramen nerve block

Anaesthesia of Maxilla -

Intra - orbital nerve block.

Posterior superior alveolar nerve block

Maxillary nerve block - techniques.

## GENERAL ANAESTHESIA –

Concept of general anaesthesia.

Indications of general anaesthesia in dentistry.

Pre-anaesthetic evaluation of the patient.

Pre-anaesthetic medication - advantages, drugs used.

Commonly used anaesthetic agents.

Complication during and after G.A.

I.V. sedation with Diazepam and Medazolam.

Indications, mode of action, technique etc.

Cardiopulmonary resuscitation

Use of oxygen and emergency drugs.

Tracheostomy.

## RECOMMENDED BOOKS:

1. Impacted teeth; Alling John F & etal.
2. Principles of oral and maxillofacial surgery; Vol.1,2 & 3 Peterson LJ & etal.
3. Text book of oral and maxillofacial surgery; Srinivasan B.
4. Handbook of medical emergencies in the dental office, Malamed SF.
5. Killeys Fractures of the mandible; Banks P.
6. Killeys fractures of the middle 3rd of the facial skeleton; Banks P.
7. The maxillary sinus and its dental implications; McGovanda
8. Killey and Kays outline of oral surgery – Part-1; Seward GR & etal
9. Essentials of safe dentistry for the medically compromised patients; Mc Carthy FM
10. Oral & maxillofacial surgery, Vol 2; Laskin DM
11. Extraction of teeth;Howe, GL
12. Minor Oral Surgery; Howe.GL
13. Contemporary oral and maxillofacial surgery; Peterson I.J.& EA
14. Oral and maxillofacial infections; Topazian RG & Goldberg MH

## **16. ORAL MEDICINE AND RADIOLOGY**

### **SECTION (A) – DIAGNOSTIC METHODS.**

- (1) Definition and importance of Diagnosis and various types of diagnosis
- (2) Method of clinical examinations.
  - (a) General Physical examination by inspection.
  - (b) Oro-facial region by inspection, palpation and other means
  - (c) To train the students about the importance, role, use of saliva and techniques of diagnosis of saliva as part of oral disease
  - (d) Examination of lesions like swellings, ulcers, erosions, sinus, fistula, growths, pigmented lesions, white and red patches
  - (e) Examination of lymph nodes
  - (f) Forensic examination – Procedures for post-mortem dental examination; maintaining dental records and their use in dental practice and post-mortem identification; jurisprudence and ethics.
- (3) Investigations
  - (a) Biopsy and exfoliative cytology
  - (b) Hematological, Microbiological and other tests and investigations necessary for diagnosis and prognosis

### **SECTION (B) – DIAGNOSIS, DIFFERENTIAL DIAGNOSIS**

While learning the following chapters, emphasis shall be given only on diagnostic aspects including differential diagnosis

- (1) Teeth: Developmental abnormalities, causes of destruction of teeth and their sequelae and discoloration of teeth
- (2) Diseases of bone and Osteodystrophies: Development disorders: Anomalies, Exostosis and tori, infantile cortical hyperostosis, osteogenesis imperfecta, Marfans syndrome, osteopetrosis. Inflammation – Injury, infection and spread of infection, fascial space infections, osteoradionecrosis.  
Metabolic disorders – Histiocytosis  
Endocrine – Acro-megaly and hyperparathyroidism  
Miscellaneous – Paget's disease, Mono and polyostotic fibrous dysplasia, Cherubism.
- (3) Temporomandibular joint: Developmental abnormalities of the condyle. Rheumatoid arthritis,

Osteoarthritis, Sub-luxation and luxation.

(4) Common cysts and Tumors:

CYSTS: Cysts of soft tissue: Mucocele and Ranula

Cysts of bone: Odontogenic and nonodontogenic.

TUMORS:

Soft Tissue:

Epithelial: Papilloma, Carcinoma, Melanoma

Connective tissue: Fibroma, Lipoma, Fibrosarcoma

Vascular: Haemangioma, Lymphangioma

Nerve Tissue: Neurofibroma, Traumatic Neuroma, Neurofibromatosis

Salivary Glands: Pleomorphic adenoma, Adenocarcinoma, Warthin's Tumor, Adenoid cystic carcinoma.

Hard Tissue:

Non Odontogenic: Osteoma, Osteosarcoma, Osteoclastoma, Chondroma, Chandrosarcoma, Central giant cell tumor, and Central haemangioma

Odontogenic: Enameloma, Ameloblastoma, Calcifying Epithelial Odontogenic tumor, Adenomatoid

Odontogenic tumor, Periapical cemental dysplasia and odontomas

(5) Periodontal diseases: Gingival hyperplasia, gingivitis, periodontitis, pyogenic granuloma

(6) Granulomatous diseases: Tuberculosis, Sarcoidosis, Midline lethal granuloma, Crohn's Disease and Histiocytosis X

(7) Miscellaneous Disorders: Burkitt lymphoma, sturge – Weber syndrome, CREST syndrome, renduosler- weber disease

SECTION (C): ORAL MEDICINE AND THERAPEUTICS.

The following chapters shall be studied in detail including the etiology, pathogenesis, clinical features, investigations, differential diagnosis, management and prevention

(1) Infections of oral and paraoral structures:

Bacterial: Streptococcal, tuberculosis, syphilis, vincent's, leprosy, actinomycosis, diphtheria and tetanus

Fungal: Candida albicans

Virus: Herpes simplex, herpes zoster, ramsay hunt syndrome, measles, herpangina, mumps, infectious mononucleosis, AIDS and hepatitis-B

(2) Important common mucosal lesions:

White lesions: Chemical burns, leukodema, leukoplakia, fordyce spots, stomatitis nicotina palatinus, white sponge nevus, candidiasis, lichenplanus, discoid lupus erythematosus

Veiculo-bullous lesions: Herpes simplex, herpes zoster, herpangina, bullous lichen planus, pemphigus, cicatricial pemphigoid erythema multiforme.

Ulcers: Acute and chronic ulcers

Pigmented lesions: Exogenous and endogenous

Red lesions: Erythroplakia, stomatitis venenata and medicamentosa, erosive lesions and denture sore mouth.

(3) Cervico-facial lymphadenopathy

(4) Facial pain:

(i) Organic pain: Pain arising from the diseases of orofacial tissues like teeth, pulp, gingival, periodontal tissue, mucosa, tongue, muscles, blood vessels, lymph tissue, bone, paranasal sinus, salivary glands etc.,

(ii) Pain arising due to C.N.S. diseases:

(a) Pain due to intracranial and extracranial involvement of cranial nerves. (Multiple sclerosis, cerebrovascular diseases, trotter's syndrome etc.)

(b) Neuralgic pain due to unknown causes: Trigeminal neuralgia, glossopharyngeal neuralgia, sphenopalatine ganglion neuralgia, periodic migrainous neuralgia and atypical facial pain

(iii) Referred pain: Pain arising from distant tissues like heart, spine etc.,

(5) Altered sensations: Cacogeusia, halitosis

(6) Tongue in local and systemic disorders: (Aglossia, ankyloglossia, bifid tongue, fissured tongue, scrotal tongue, macroglossia, microglossia, geographic tongue, median rhomboid glossitis, depapillation of tongue, hairy tongue, atrophic tongue, reactive lymphoid hyperplasia, glossodynia, glossopyrosis, ulcers, white and red patches etc.)

(7) Oral manifestations of:

(i) Metabolic disorders:

(a) Porphyria

(b) Haemochromatosis



(c) Histiocytosis X diseases

(ii) Endocrine disorders:

(a) Pituitary: Gigantism, acromegaly, hypopituitarism

(b) Adrenal cortex: Addison's disease (Hypofunction)

Cushing's syndrome (Hyperfunction)

(c) Parathyroid glands: Hyperparathyroidism.

(d) Thyroid gland: (Hypothyroidism) Cretinism, myxedema

(e) Pancreas: Diabetes

(iii) Nutritional deficiency: Vitamins: riboflavin, nicotinic acid, folic acid Vitamin

B12, Vitamin C (Scurvy)

(iv) Blood disorders:

(a) Red blood cell diseases

Deficiency anemias: (Iron deficiency, plummer – vinson syndrome, pernicious anemia)

Haemolytic anemias: (Thalassemia, sickle cell anemia, erythroblastosis fetalis)

Aplastic anemia

Polycythemia

(b) White Blood cell diseases

Neutropenia, cyclic neutropenia, agranulocytosis, infectious mononeucleosis and leukemias

(c) Haemorrhagic disorders:

Thrombocytopenia, purpura, hemophillia, christmas disease and von willebrand's disease

(8) Disease of salivary glands:

(i)Development disturbances: Aplasia, atresia and aberration

(ii) Functional disturbances: Xerostomia, ptyalism

(iii) Inflammatory conditions: Nonspecific sialadenitis, mumps, sarcoidosis heerdfort's syndrome

(Uveoparotid fever), Necrotising sialometaplasia

(iv) Cysts and tumors: Mucocele, ranula, pleomorphic adenoma, mucoepidermoid carcinoma

(v) Miscellaneous: Sialolithiasis, sjogren's syndrome, mikuliez's disease and sialosis

(9) Dermatological diseases with oral manifestations:

(a) Ectodermal dysplasia (b) Hyperkerotosis palmarplantaris with periodontopathy (c)

Scleroderma (d) Lichen planus including ginspan's syndrome (e) Luplus erythematosus (f)

Pemphigus (g) Erythema multiforme (h) Psoriasis

(10) Immunological diseases with oral manifestations

(a) Leukemia (b) Lymphomas (c) Multiple myeloma (d) AIDS clinical manifestations, opportunistic infections, neoplasms (e) Thrombocytopenia (f) Lupus erythematosus (g) Scleroderma (h) dermatomyositis (I) Submucous fibrosis (j) Rheumatoid arthritis (k) Recurrent oral ulcerations including Behçet's syndrome and Reiter's syndrome

(11) Allergy: Local allergic reactions, anaphylaxis, serum sickness (local and systemic allergic manifestations to food drugs and chemicals)

(12) Foci of oral infection and their ill effects on general health

(13) Management of dental problems in medically compromised persons:

(i) Physiological changes: Puberty, pregnancy and menopause

(ii) The patients suffering with cardiac, respiratory, liver, kidney and bleeding disorders, hypertension, diabetes and AIDS. Post-irradiated patients.

(14) Precancerous lesions and conditions

(15) Nerve and muscle diseases:

(i) Nerves: (a) Neuropraxia (b) Neurotmesis (c) Neuritis (d) Facial nerve paralysis including Bell's palsy, Heerfordt's syndrome, Melkersson Rosenthal syndrome and Ramsay Hunt syndrome

(e) Neuroma (f) Neurofibromatosis (g) Frey's syndrome

(ii) Muscles: (a) Myositis ossificans (b) Myofascial pain dysfunction syndrome (c) Trismus

(16) Forensic odontology:

(a) Medicolegal aspects of orofacial injuries

(b) Identification of bite marks

(c) Determination of age and sex

(d) Identification of cadavers by dental appliances, Restorations and tissue remnants

(17) Therapeutics: General therapeutic measures – drugs commonly used in oral medicine viz., antibiotics, chemotherapeutic agents, anti-inflammatory and analgesic drugs, astringents, mouth washes, styptics, demulcents, local surface anaesthetic, sialogogues, antisialogogues and drugs used in the treatment of malignancy

Part – II BEHAVIOURAL SCIENCES AND ETHICS.

Part – III ORAL RADIOLOGY

- (1) Scope of the subject and history of origin
- (2) Physics of radiation: (a) Nature and types of radiations (b) Source of radiations (c) Production of Xrays
- (d) Properties of X-rays (e) Compton effect (f) Photoelectric effect (g) Radiation measuring units
- (3) Biological effects of radiation
- (4) Radiation safety and protection measures
- (5) Principles of image production
- (6) Radiographic techniques:
  - (i) Intra-Oral: (a) Periapical radiographs (Bisecting and parallel technics) (b) Bite wing radiographs
  - (c) Occlusal radiographs
  - (ii) Extra-oral: (a) Lateral projections of skull and jaw bones and paranasal sinuses (c) Cephalograms (d) Orthopantomograph (e) Projections of temporomandibular joint and condyle of mandible (f) Projections for Zygomatic arches
  - (iii) Specialised techniques: (a) Sialography (b) Xeroradiography (c) Tomography
- (7) Factors in production of good radiographs:
  - (a) K.V.P. and mA. of X-ray machine (b) Filters (c) Collimations (d) Intensifying screens (e) Grids (f) X-ray films (g) Exposure time (h) Techniques (i) Dark room (j) Developer and fixer solutions (k) Film processing
- (8) Radiographic normal anatomical landmarks
- (9) Faculty radiographs and artefacts in radiographs
- (10) Interpretation of radiographs in various abnormalities of teeth, bones and other orofacial tissues
- (11) Principles of radiotherapy of oro-facial malignancies and complications of radiotherapy
- (12) Contrast radiography and basic knowledge of radio-active isotopes
- (13) Radiography in Forensic Odontology - Radiographic age estimation and post-mortem radiographic methods

#### PRACTICALS / CLINICALS:

1. Student is trained to arrive at proper diagnosis by following a scientific and systematic procedure of history taking and examination of the orofacial region. Training is also imparted in

management wherever possible. Training also shall be imparted on saliva diagnostic procedures. Training also shall be imparted in various radiographic procedures and interpretation of radiographs.

2. In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of university examination

3. The following is the minimum of prescribed work for recording

(a) Recording of detailed case histories of interesting cases ..... 10

(b) Intra-oral radiographs (Periapical, bitewing, occlusal) ..... 25

(c) Saliva diagnostic check as routine procedure

#### BOOKS RECOMMENDED:

##### a) Oral Diagnosis, Oral Medicine & Oral Pathology

1. Burkit – Oral Medicine – J.B. Lippincott Company
2. Coleman – Principles of Oral Diagnosis – Mosby Year Book
3. Jones – Oral Manifestations of Systemic Diseases – W.B. Saunders company
4. Mitchell – Oral Diagnosis & Oral Medicine
5. Kerr – Oral Diagnosis
6. Miller – Oral Diagnosis & Treatment
7. Hutchinson – clinical Methods
8. Oral Pathology – Shafers
9. Sonis.S.T., Fazio.R.C. and Fang.L - Principles and practice of Oral Medicine

##### b) Oral Radiology

1. White & Goaz – Oral Radiology – Mosby year Book
2. Weahrman – Dental Radiology – C.V. Mosby Company
3. Stafne – Oral Roentgenographic Diagnosis – W.B.Saunders Co.,

##### c) Forensic Odontology

1. Derek H.Clark – Practical Forensic Odontology - Butterworth-Heinemann (1992)

2.C Michael Bowers, Gary Bell – Manual of Forensic Odontology - Forensic Pr (1995)

## **Forensic Odontology**

### 1. Introduction to forensic dentistry

Definition and history

Recent developments and future trends

### 2. Overview of forensic medicine and toxicology

Cause of death and postmortem changes

Toxicological manifestations in teeth and oral tissues

### 3. Dental identification

Definition

Basis for dental identification

Postmortem procedures

Dental record compilation and interpretation

Comparison of data, and principles of report writing

Identification in disasters and handling incinerated remains

Postmortem changes to oral structures

### 4. Maintaining dental records

Basic aspects of good record-keeping

Different types of dental records

- Dental charts
- Dental radiographs
- Study casts
- Denture marking
- Photographs

Dental notations

Relevance of dental records in forensic investigation

### 5. Age estimation

Age estimation in children and adolescents

- Advantages of tooth calcification over 'eruption' in estimating age

▫ Radiographic methods of Schour & Massler, Demirjian et al

Age estimation in adults

▫ Histological methods – Gustafson’s six variables and Johanson’s modification, Bang &

Ramm’s dentine translucency

▫ Radiographic method of Kvaal et al

Principles of report writing

## 6. Sex differentiation

Sexual dimorphism in tooth dimensions (Odontometrics)

## 7. Ethnic variations (‘racial’ differences) in tooth morphology

Description of human population groups

Genetic and environmental influences on tooth morphology

Description of metric and non-metric dental features used in ethnic differentiation

## 8. Bite mark procedures

Definition and classification

Basis for bite mark investigation

Bite mark appearance

Macroscopic and microscopic ageing of bite marks

Evidence collection from the victim and suspect of bite mark

Analysis and comparison

Principles of report writing

Animal bite investigation

## 9. Dental DNA methods

Importance of dental DNA evidence in forensic investigations

Types of DNA and dental DNA isolation procedures

DNA analysis in personal identification

Gene-linked sex dimorphism

Population genetics

## 10. Jurisprudence and ethics

Fundamentals of law and the constitution

Medical legislation and statutes (Dental and Medical Council Acts, etc)

Basics of civil law (including torts, contracts and consumer protection act)

Criminal and civil procedure code (including expert witness requirement)

Assessment and quantification of dental injuries in courts of law

Medical negligence and liability

Informed consent and confidentiality

Rights and duties of doctors and patients

Medical and dental ethics (as per Dentists' Act)

Theory sessions and practical exercises

Total hours for the course

§ Didactic – 10-12 hours

§ Practical – 20-25 hours

Detailed didactic sessions for the above components, either in the form of lectures or as structure student-teacher interactions, is essential. Specialists from multiple disciplines, particularly from legal and forensic sciences, can be encouraged to undertake teaching in their area of expertise.

An interactive, navigable and non-linear (INN) model may also be utilised for education.

Practical exercises (real-life casework and/or simulated cases) must complement didactic sessions to facilitate optimal student understanding of the subject. Mandatory practical training in dental identification methods, dental profiling (ethnic and sex differences, radiographic age estimation), and bite mark procedures, is of paramount importance. In addition, practical exercises/demonstrations in histological age estimation, comparative dental anatomy, DNA methods, medical autopsy, court visits, and other topics may be conducted depending on available expertise, equipment and feasibility.

Approach to teaching forensic odontology

Forensic odontology could be covered in two separate streams. The divisions include a preclinical stream and a clinical stream.

Preclinical stream

§ Introduction to forensic odontology

§ Sex differences in odontometrics

§ Ethnic variations in tooth morphology

§ Histological age estimation

§ Dental DNA methods

- § Bite marks procedures
- § Overview of forensic medicine and toxicology

Clinical stream

- § Dental identification
- § Maintaining dental records
- § Radiographic age estimation
- § Medical jurisprudence and ethics

## **17. ORTHODONTICS & DENTAL ORTHOPAEDICS**

1. Introduction, Definition, Historical Background, Aims And Objectives Of Orthodontics And Need For Orthodontics Care.
2. Growth And Development: In General
  - a. Definition
  - b. Growth spurts and Differential growth
  - c. Factors influencing growth and Development
  - d. Methods of measuring growth
  - e. Growth theories (Genetic, Sicher's, Scott's, Moss's, Petrovics, Multifactorial)
  - f. Genetic and epigenetic factors in growth
  - g. Cephalocaudal gradient in growth.
3. Morphologic Development Of Craniofacial Structures
  - a. Methods of bone growth
  - b. Prenatal growth of craniofacial structures
  - c. Postnatal growth and development of: cranial base, maxilla, mandible, dental arches and occlusion.
4. Functional Development Of Dental Arches And Occlusion
  - a. Factors influencing functional development of dental arches and occlusion.
  - b. Forces of occlusion
  - c. Wolfe's law of transformation of bone



d. Trajectories of forces

5. Clinical Application Of Growth And Development

6. Malocclusion - In General

a. Concept of normal occlusion

b. Definition of malocclusion

c. Description of different types of dental, skeletal and functional malocclusion.

7. Classification of Malocclusion

Principle, description, advantages and disadvantages of classification of malocclusion by Angle's, Simon's, Lischer's and Ackerman and Proffitt's.

8. Normal And Abnormal Function Of Stomatognathic System

9. Etiology Of Malocclusion

a. Definition, importance, classification, local and general etiological factors.

b. Etiology of following different types of malocclusion:

1) Midline diastema

2) Spacing

3) Crowding

4) Cross-Bite: Anterior/Posterior

5) Class III Malocclusion

6) Class II Malocclusion

7) Deep Bite

8) Open bite

10. Diagnosis And Diagnostic Aids

a. Definition, Importance and classification of diagnostic aids

b. Importance of case history and clinical examination in orthodontics

c. Study Models: - Importance and uses - Preparation and preservation of study models

d. Importance of intraoral X-rays in orthodontics

e. Panoramic radiographs: - Principles, Advantages, disadvantages and uses

f. Cephalometrics: Its advantages, disadvantages

- Definition
- Description and use of cephalostat
- Description and uses of anatomical landmarks lines and angles used in cephalometric

- analysis
- Analysis- Steiner's, Down's, Tweed's, Ricket's-E- line

g. Electromyography and its uses in orthodontics

h. Wrist X-rays and its importance in orthodontics

11. General Principles In Orthodontic Treatment Planning Of Dental And Skeletal Malocclusions

12. Anchorage In Orthodontics - Definition, Classification, Types and Stability Of Anchorage

13. Biomechanical Principles In Orthodontic Tooth Movement

a. Different types of tooth movements

b. Tissue response to orthodontic force application

c. Age factor in orthodontic tooth movement

14. Preventive Orthodontics

a. Definition

b. Different procedures undertaken in preventive orthodontics and their limitations.

15. Interceptive Orthodontics

a. Definition

b. Different procedures undertaken in interceptive orthodontics

c. Serial extractions: Definition, indications, contra-indication, technique, advantages and disadvantages.

d. Role of muscle exercises as an interceptive procedure

16. Corrective Orthodontics

a. Definition, factors to be considered during treatment planning.

b. Model analysis: Pont's, Ashley Howe's, Bolton, Careys, Moyer's Mixed Dentition Analysis

c. Methods of gaining space in the arch:- Indications, relative merits and demerits of proximal stripping, arch expansion and extractions

d. Extractions in Orthodontics - indications and selection of teeth for extraction.

17. Orthodontic Appliances: General

a. Requisites for orthodontic appliances

b. Classification, indications of Removable and Functional Appliances

c. Methods of force application

d. Materials used in construction of various orthodontic appliances - uses of stainless steel, technical considerations in curing of acrylic, Principles of welding and soldering, fluxes and antiluxes.

e. Preliminary knowledge of acid etching and direct bonding.

18. Ethics

#### REMOVABLE ORTHODONTIC APPLIANCES

1) Components of removable appliances

2) Different types of clasps and their uses

3) Different types of labial bows and their uses

4) Different types of springs and their uses

5) Expansion appliances in orthodontics:

i) Principles

ii) Indications for arch expansion

iii) Description of expansion appliances and different types of expansion devices and their uses.

iv) Rapid maxillary expansion

#### FIXED ORTHODONTIC APPLIANCES

1. Definition, Indications & Contraindications

2. Component parts and their uses

3. Basic principles of different techniques: Edgewise, Begg's, straight wire.

#### EXTRAORAL APPLIANCES

1. Headgears

2. chin cup

3. reverse pull headgears

#### MYOFUNCTIONAL APPLIANCES

1. Definition and principles

2. Muscle exercises and their uses in orthodontics

3. Functional appliances:

i) Activator, Oral screens, Frankels function regulator, bionator twin blocks, lip bumper

ii) Inclined planes - upper and lower

18. Orthodontic Management Of Cleft Lip And Palate

19. Principles Of Surgical Orthodontics

Brief knowledge of correction of:

- a. Mandibular Prognathism and Retrognathism
- b. Maxillary Prognathism and Retrognathism
- c. Anterior open bite and deep bite
- d. Cross bite

20. Principle, Differential Diagnosis & Methods Of Treatment Of:

1. Midline diastema
2. Cross bite
3. Open bite
4. Deep bite
5. Spacing
6. Crowding
7. Class II - Division 1, Division 2
8. Class III Malocclusion - True and Pseudo Class III

21. Retention And Relapse

Definition, Need for retention, Causes of relapse, Methods of retention, Different types of retention devices, Duration of retention, Theories of retention.

## CLINICALS AND PRACTICALS IN ORTHODONTICS

### PRACTICAL TRAINING DURING II YEAR B.D.S.

I. Basic wire bending exercises Gauge 22 or 0.7mm

1. Straightening of wires (4 Nos.)
2. Bending of an equilateral triangle
3. Bending of a rectangle
4. Bending of a square
5. Bending of a circle
6. Bending of U.V.

II. Construction of Clasps (Both sides upper/lower) Gauge 22 or 0.7mm

1. 3/4 Clasp (C-Clasp)
2. Full Clasp (Jackson's Crib)
3. Adam's Clasp

#### 4. Triangular Clasp

### III. Construction of Springs (on upper both sides) Gauge 24 or 0.5mm

#### 1. Finger Spring

#### 2. Single Cantelever Spring

#### 3. Double Cantelever Spring (Z-Spring)

#### 4. T-Springs on premolars

### IV. Construction of Canine retractors Gauge 23 or 0.6mm

#### 1. U - Loop canine retractor

(Both sides on upper & lower)

#### 2. Helical canine retractor

(Both sides on upper & lower)

#### 3. Buccal canine retractor:

- Self supported buccal canine retractor with

a) Sleeve - 5mm wire or 24 gauge

b) Sleeve - 19 gauge needle on any one side.

#### 4. Palatal canine retractor on upper both sides

Gauge 23 or 0.6mm

### V. Labial Bow

Gauge 22 or 0.7mm

One on both upper and lower

### CLINICAL TRAINING DURING III YEAR B.D.S.

01. Making upper Alginate impression

02. Making lower Alginate impression

03. Study Model preparation

04. Model Analysis

a. Pont's Analysis

b. Ashley Howe's Analysis

c. Carey's Analysis

d. Bolton's Analysis

e. Moyer's Mixed Dentition Analysis

## CLINICAL TRAINING DURING FINAL YEAR B.D.S.

01. Case History taking
02. Case discussion
03. Discussion on the given topic
04. Cephalometric tracings
  - a. Down's Analysis
  - b. Steiner's Analysis
  - c. Tweed's Analysis

## PRACTICAL TRAINING DURING FINAL YEAR B.D.S.

1. Adam's Clasp on Anterior teeth Gauge 0.7mm
2. Modified Adam's Clasp on upper arch Gauge 0.7mm
3. High Labial bow with Apron spring on upper arch  
(Gauge of Labial bow - 0.9mm, Apron spring - 0.3mm)
4. Coffin spring on upper arch Gauge 1mm

### Appliance Construction in Acrylic

1. Upper & Lower Hawley's Appliance
2. Upper Hawley's with Anterior bite plane
3. Upper Habit breaking Appliance
4. Upper Hawley's with Posterior bite plane with 'Z' Spring
5. Construction of Activator
6. Lower inclined plane/Catalan's Appliance
7. Upper Expansion plate with Expansion Screw

## RECOMMENDED AND REFERENCE BOOKS

1. CONTEMPORARY ORTHODONTICS WILLIAM R. PROFFIT
2. ORTHODONTICS FOR DENTAL STUDENTS WHITE and GARDINER
3. HANDBOOK OF ORTHODONTICS MOYERS
4. ORTHODONTICS - PRINCIPLES AND PRACTICE GRABER
5. DESIGN, CONSTRUCTION AND USE OF REMOVABLE

6. ORTHODONTIC APPLIANCES C. PHILIP ADAMS

7. CLINICAL ORTHODONTICS: VOL1 & 2 SALZMANN

## **18. PAEDIATRIC & PREVENTIVE DENTISTRY**

THEORY:

1. INTRODUCTION TO PEDODONTICS & PREVENTIVE DENTISTRY.

- Definition, Scope, Objectives and Importance.

2. GROWTH & DEVELOPMENT:

- Importance of study of growth and development in Pedodontics.

- Prenatal and Postnatal factors in growth & development.

- Theories of growth & development.

- Development of maxilla and mandible and related age changes.

3. DEVELOPMENT OF OCCLUSION FROM BIRTH THROUGH ADOLESCENCE.

- Study of variations and abnormalities.

4. DENTAL ANATOMY AND HISTOLOGY:

- Development of teeth and associated structures.

- Eruption and shedding of teeth.

- Teething disorders and their management.

- Chronology of eruption of teeth.

- Differences between deciduous and permanent teeth.

- Development of dentition from birth to adolescence.

- Importance of first permanent molar.

5. DENTAL RADIOLOGY RELATED TO PEDODONTICS.

6. ORAL SURGICAL PROCEDURES IN CHILDREN.

- Indications and contraindications of extractions of primary and permanent teeth in children.

- Knowledge of Local and General Anesthesia.

- Minor surgical procedures in children.

7. DENTAL CARIES:

- Historical background.

- Definition, aetiology & pathogenesis.

- Caries pattern in primary, young permanent and permanent teeth in children.
- Rampant caries, early childhood caries and extensive caries:
  - \* Definition, aetiology, Pathogenesis, Clinical features, Complications & Management
- Role of diet and nutrition in Dental Caries.
- Dietary modifications & Diet counseling.
- Caries activity, tests, caries prediction, caries susceptibility & their clinical application.

## 8. GINGIVAL & PERIODONTAL DISEASES IN CHILDREN.

- Normal gingiva & periodontium in children.
- Definition, aetiology & Pathogenesis.
- Prevention & Management of gingival & Periodontal diseases.

## 9. CHILD PSYCHOLOGY:

- Definition.
- Theories of child psychology.
- Psychological development of children with age.
- Principles of psychological growth & development while managing child patient.
- Dental fear and its management.
- Factors affecting child's reaction to dental treatment.

## 10. BEHAVIOUR MANAGEMENT:

- Definitions.
- Types of behaviour encountered in the dental clinic.
- Non-pharmacological & pharmacological methods of Behaviour Management.

## 11. PEDIATRIC OPERATIVE DENTISTRY:

- Principles of Pediatric Operative Dentistry.
- Modifications required for cavity preparation in primary and young permanent teeth.
- Various Isolation Techniques.
- Restorations of decayed primary, young permanent and permanent teeth in children using various restorative materials like Glass Ionomer, Composites & Silver Amalgam. Stainless steel, Polycarbonate & Resin Crowns.

## 12. PEDIATRIC ENDODONTICS

- Principles & Diagnosis.
- Classification of Pulpal Pathology in primary, young permanent & permanent teeth.



- Management of Pulpally involved primary, young permanent & permanent teeth.
- Pulp capping – direct & indirect.
- Pulpotomy
- Pulpectomy
- Apexogenesis
- Apexification
- Obturation Techniques & material used for primary, young permanent & Permanent teeth in children.

### 13. TRAUMATIC INJURIES IN CHILDREN:

- Classifications & Importance.
- Sequelae & reaction of teeth to trauma.
- Management of Traumatized teeth.

### 14. PREVENTIVE & INTERCEPTIVE ORTHODONTICS:

- Definitions.
- Problems encountered during primary and mixed dentition phases & their management.
- Serial extractions.
- Space management.

### 15. ORAL HABITS IN CHILDREN:

- Definition, Aetiology & Classification.
- Clinical features of digit sucking, tongue thrusting, mouth breathing & various other secondary habits.
- Management of oral habits in children.

### 16. DENTAL CARE OF CHILDREN WITH SPECIAL NEEDS:

- Definition, Aetiology, Classification, Behavioural and Clinical features & Management of children with:
  - Physically handicapping conditions.
  - Mentally compromising conditions.
  - Medically compromising conditions.
  - Genetic disorders.

### 17. CONGENITAL ABNORMALITIES IN CHILDREN:

- Definition, Classification, Clinical features & Management.

18. DENTAL EMERGENCIES IN CHILDREN & THEIR MANAGEMENT.

19. DENTAL MATERIALS USED IN PEDIATRIC DENTISTRY.

20. PREVENTIVE DENTISTRY:

- Definition.
- Principles & Scope.
- Types of prevention.
- Different preventive measures used in Pediatric Dentistry including pit and fissure sealants and caries vaccine.

21. DENTAL HEALTH EDUCATION & SCHOOL DENTAL HEALTH PROGRAMMES.

22. FLUORIDES:

- Historical background.
- Systemic & Topical fluorides.
- Mechanism of action.
- Toxicity & Management.
- Defluoridation techniques.

23. CASE HISTORY RECORDING:

- Outline of principles of examination, diagnosis & treatment planning.

24. SETTING UP OF PEDODONTIC CLINIC.

25. ETHICS.

## **B. Behavioural Sciences**

PSYCHOLOGY:

1. Definition & Need of Behavioural Science. Determinants of Behaviour. Hrs 1 Scope of Behavioural Science.

2. Sensory process & perception perceptual process- clinical applications.

3. Attention - Definition - factors that determine attention. Clinical application.

4. Memory - Memory process - Types of memory , Forgetting:

Methods to improve memory, Clinical assessment of memory & clinical applications.

5. Definition - Laws of learning

Type of learning. Classical conditioning, operant conditioning, cognitive learning, Insight learning, social learning, observational learning, principles of learning– Clinical application.

6. Intelligence- Definition: Nature of intelligence stability of intelligence  
Determinants of intelligence, clinical application
  7. Thinking - Definition: Types of thinking, delusions, problem solving
  8. Motivation - Definition: Motive, drive, needs classification of motives
  9. Emotions - Definition differentiation from feelings – Role of hypothalamus, Cerebral cortex, adrenal glands ANS. Theories of emotion, Types of emotions.
- Personality. Assessment of personality: Questionnaires, personality inventory, rating scales, Interview projective techniques – Rorshach ink blot test , RAT, CAT

### C. PRACTICALS:

Following is the recommended clinical quota for under-graduate students in the subject of pediatric & preventive dentistry.

1. Restorations – Class I & II only : 45
2. Preventive measures e.g. Oral Prophylaxis – 20.
3. Fluoride applications – 10
4. Extractions – 25
5. Case History Recording & Treatment Planning – 10
6. Education & motivation of the patients using disclosing agents. Educating patients about oral hygiene measures like tooth brushing, flossing etc.

### BOOKS RECOMMENDED & REFERENCE:

1. Pediatric Dentistry (Infancy through Adolescence) – Pinkham.
2. Kennedy's Pediatric Operative Dentistry – Kennedy & Curzon.
3. Occlusal guidance in Pediatric Dentistry – Stephen H. Wei.
4. Clinical Use of Fluorides – Stephen H. Wei.
5. Pediatric Oral & Maxillofacial Surgery – Kaban.
6. Pediatric Medical Emergencies – P. S. Whatt.
7. Understanding of Dental Caries – Niki Foruk.
8. An Atlas of Glass Ionomer cements – G. J. Mount.
9. Clinical Pedodontics – Finn.

10. Textbook of Pediatric Dentistry – Braham Morris.
11. Primary Preventive Dentistry – Norman O. Harris.
12. Handbook of Clinical Pedodontics – Kenneth. D.
13. Preventive Dentistry – Forrester.
14. The Metabolism and Toxicity of Fluoride – Garry M. whitford.
15. Dentistry for the Child and Adolescence – Mc. Donald.
16. Pediatric Dentistry – Damle S. G.
17. Behaviour Management – Wright
18. Pediatric Dentistry – Mathewson.
19. Traumatic Injuries – andreason.
20. Occlusal guidance in Pediatric Dentistry – Nakata.
21. Pediatric Drug Therapy – Tomare
22. Contemporary Orthodontics – Profitt..
23. Preventive Dentistry – Depaola.
24. Metabolism & Toxicity of Fluoride – whitford. G. M.
25. Endodontic Practice – Grossman.
26. Principles of Endodontics – Munford.
27. Endodontics – Ingle.
28. Pathways of Pulp – Cohen.
29. Management of Traumatized anterior Teeth – Hargreaves.

## **19. PUBLIC HEALTH DENTISTRY**

1. Introduction to Dentistry: Definition of Dentistry, History of dentistry, Scope, aims and objectives of Dentistry.
2. Public Health:
  - i. Health & Disease: - Concepts, Philosophy, Definition and Characteristics
  - ii. Public Health: - Definition & Concepts, History of public health
  - iii. General Epidemiology: - Definition, objectives, methods
  - iv. Environmental Health: - Concepts, principles, protection, sources, purification environmental sanitation of water disposal of waste sanitation, then role in mass disorder

- v. Health Education: - Definition, concepts, principles, methods, and health education aids
- vi. Public Health Administration: - Priority, establishment, manpower, private practice management, hospital management.
- vii. Ethics and Jurisprudence: Professional liabilities, negligence, malpractice, consents, evidence, contracts, and methods of identification in forensic dentistry.
- viii. Nutrition in oral diseases
- ix. Behavioral science: Definition of sociology, anthropology and psychology and their in dental practice and community.
- x. Health care delivery system: Center and state, oral health policy, primary health care, national programmes, health organizations.

#### Dental Public Health:

1. Definition and difference between community and clinical health.
2. Epidemiology of dental diseases-dental caries, periodontal diseases, malocclusion, dental fluorosis and oral cancer.
3. Survey procedures: Planning, implementation and evaluation, WHO oral health survey methods 1997, indices for dental diseases.
4. Delivery of dental care: Dental auxiliaries, operational and non-operational, incremental and comprehensive health care, school dental health.
5. Payments of dental care: Methods of payments and dental insurance, government plans
6. Preventive Dentistry- definition, Levels, role of individual , community and profession, fluorides in dentistry, plaque control programmes.

#### Research Methodology and Dental Statistics

1. Health Information: - Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes
2. Research Methodology: -Definition, types of research, designing a written protocol
3. Bio-Statistics: - Introduction, collection of data, presentation of data, Measures of Central tendency, measures of dispersion, Tests of significance, Sampling and sampling techniques, types, errors, bias, blind trails and calibration.

#### Practice Management

1. Place and locality
2. Premises & layout

3. Selection of equipments
4. Maintenance of records/accounts/audit.

Dentist Act 1948 with amendment.

Dental Council of India and State Dental Councils

Composition and responsibilities.

Indian Dental Association

Head Office, State, local and branches.

#### PRACTICALS/CLINICALS/FIELD PROGRAMME IN COMMUNITY DENTISTRY:

These exercises designed to help the student in IV year students:

1. Understand the community aspects of dentistry
2. To take up leadership role in solving community oral health programme

Exercises:

- a) Collection of statistical data (demographic) on population in India, birth rates, morbidity and mortality, literacy, per capita income
- b) Incidence and prevalence of common oral diseases like dental caries, periodontal disease, oral cancer, fluorosis at national and international levels
- c) Preparation of oral health education material posters, models, slides, lectures, play acting skits etc.
- d) Oral health status assessment of the community using indices and WHO basic oral health survey methods
- e) Exploring and planning setting of private dental clinics in rural, semi urban and urban locations, availment of finances for dental practices-preparing project report.
- f) Visit to primary health center-to acquaint with activities and primary health care delivery
- g) Visit to water purification plant/public health laboratory/ center for treatment of waste and sewage water
- h) Visit to schools-to assess the oral health status of school children, emergency treatment and health education including possible preventive care at school (tooth brushing technique demonstration and oral rinse programme etc.)
- i) Visit to institution for the care of handicapped, physically, mentally, or medically compromised patients

j) Preventive dentistry: in the department application of pit and fissure sealants, fluoride gel application procedure, A. R. T., Comprehensive health for 5 pts at least 2 patients

The colleges are encouraged to involve in the N.S.S. programme for college students for carrying out social work in rural areas

#### SUGGESTED INTERNSHIP PROGRAMME IN COMMUNITY DENTISTRY:

##### I. AT THE COLLEGE:

Students are posted to the department to get training in dental practice management.

(a) Total oral health care approach- in order to prepare the new graduates in their approach to diagnosis, treatment planning, cost of treatment, prevention of treatment on schedule, recall maintenance of records etc. at least 10 patients (both children and adults of all types posting for at least one month).

(b) The practice of chair side preventive dentistry including oral health education

##### II. AT THE COMMUNITY ORAL HEALTH CARE CENTRE (ADOPTED BY THE DENTAL COLLEGE IN RURAL AREAS)

Graduates posted for at least on month to familiarize in:

(a) Survey methods, analysis and presentation of oral health assessment of school children and community independently using WHO basic oral health survey methods.

(b) Participation in rural oral health education programmes

(c) Stay in the village to understand the problems and life in rural areas

##### III. DESIRABLE: Learning use of computers-at least basic programme.

##### Examination Pattern

##### I. Index: Case History

b) Oral hygiene indices simplified- Green and Vermilion

c) Silness and Loe index for Plaque

d) Loe and Silness index for gingival

e) CPI

f) DMF: T and S, df:t and s

g) Deans fluoride index

##### II. Health Education

1. Make one - Audio visual aid

2. Make a health talk

III. Practical work

1. Pit and fissure sealant

2. Topical fluoride application

#### BOOKS RECOMMENDED & REFERENCE:

1. Dentistry Dental Practice and Community by David F. Striffler and Brain A. Burt, Edn. – 1983, W.

B. Saunders Company

2. Principles of Dental Public Health by James Morse Dunning, IVth Edition, 1986, Harward University Press.

3. Dental Public Health and Community Dentistry Ed by Anthony Jong Publication by The C. V. Mosby Company 1981

4. Community Oral Health-A system approach by Patricia P. Cormier and Joyce I. Levy published by Appleton-Century-Crofts/New York, 1981

5. Community Dentistry-A problem oriented approach by P. C. Dental Hand book series Vol.8 by Stephen L. Silverman and Ames F. Tryon, Series editor-Alvin F. Gardner, PSG Publishing company Inc. Littleton Massachuselts, 1980.

6. Dental Public Health- An Introduction to Community Dentistry. Edition by Geoffrey L. Slack and Brain Burt, Published by John Wrigth and sons Bristol, 1980

7. Oral Health Surveys- Basic Methods, 4th edition, 1997, published by W. H. O. Geneva available at the regional office New Delhi.

8. Preventive Medicine and Hygiene-By Maxcy and Rosenau, published by Appleton Century Crofts, 1986.

9. Preventive Dentistry-by J. O. Forrest published by John Wright and sons Bristoli, 1980.

10. Preventive Dentistry by Murray, 1997.

11. Text Book of Preventive and Social Medicine by Park and park, 14th edition.

12. Community Dentistry by Dr. Soben Peter.

13. Introduction to Bio-statistics by B. K. Mahajan

14. Research methodology and Bio-statistics by

15. Introduction to Statistical Methods by Grewal



## **SOCIOLOGY:**

Social class, social groups – family, types of family, types of marriages, communities and Nations and institutions.

## **REFERENCE BOOKS:**

1. General psychology -- S.K. Mangal
2. General psychology -- Hans Raj, Bhatia
3. General psychology -- Munn
4. Behavioural Sciences in Medical practise -- Manju Mehta
5. Sciences basic to psychiatry -- Basanth Puri & Peter J Tyrer

## **ETHICS**

Introduction to ethics –

- what is ethics?
- What are values and norms?
- How to form a value system in one's personal and professional life?
- Hippocratic oath.
- Declaration of Helsinki, WHO declaration of Geneva, International code of ethics, DCI Code of ethics.

Ethics of the individual –

The patient as a person.

Right to be respected

Truth and confidentiality

Autonomy of decision

Doctor Patient relationship

Profession Ethics –

Code of conduct

Contract and confidentiality

Charging of fees, fee splitting

Prescription of drugs

Over-investigating the patient

Malpractice and negligence

Research Ethics –

Animal and experimental research/humanness

Human experimentation

Human volunteer research-informed consent

Drug trials

Ethical workshop of cases

Gathering all scientific factors

Gathering all value factors

Identifying areas of value – conflict, setting of priorities

Working our criteria towards decisions

Recommended Reading:

Medical Ethics, Francis C.M., I Ed. 1993, Jaypee Brothers, New Delhi p. 189.

## **20. PERIODONTOLOGY**

1. Introduction: Definition of Periodontology, Periodontics, Periodontia, Brief historical background,

Scope of Periodontics

2. Development of perio-dontal tissues, micro-structural anatomy and biology of periodontal tissues in detail Gingiva. Junctional epithelium in detail, Epithelial-Mesenchymal interaction, Periodontal, ligament Cementum, Alveolar bone.

3. Defensive mechanisms in the oral cavity: Role of-Epithelium, Gingival fluid, Saliva and other defensive mechanisms in the oral environment.

4. Age changes in periodontal structures and their significance in Geriatric dentistry

Age changes in teeth and periodontal structures and their association with periodontal diseases

5. Classification of periodontal diseases

Need for classification, Scientific basis of classification, Classification of gingival and periodontal diseases as described in World Workshop 1989

Gingivitis:

Plaque associated, ANUG, steroid hormone influenced, Medication influenced, Desquamative gingivitis, other forms of gingivitis as in nutritional deficiency, bacterial and viral infections etc.

Periodontitis:

Adult periodontitis, Rapidly progressive periodontitis A&B,

Juvenile periodontitis (localized, generalized, and post-juvenile),

Prepubertal periodontitis,

Refractory periodontitis

6. Gingival diseases Localized and generalized gingivitis, Papillary, marginal and diffuse gingivitis

Etiology, pathogenesis, clinical signs, symptoms and management of

i) Plaque associated gingivitis

ii) Systemically aggravated gingivitis (sex hormones, drugs and systemic diseases)

iii) ANUG

iv) Desquamative gingivitis-Gingivitis associated with lichen planus, pemphigoid, pemphigus, and other vesiculobullous lesions

v) Allergic gingivitis

vi) Infective gingivitis-Herpetic, bacterial and candidial

vii) Pericoronitis

viii) Gingival enlargement (classification and differential diagnosis)

7. Epidemiology of periodontal diseases

- Definition of index, incidence, prevalence, epidemiology, endemic, epidemic, and pandemic

- Classification of indices (Irreversible and reversible)

- Deficiencies of earlier indices used in Periodontics

- Detailed understanding of Silness & Loe Plaque Index, Loe & Silness Gingival Index, CPITN & CPI.

- Prevalence of periodontal diseases in India and other countries.

- Public health significance(All these topics are covered at length under community dentistry. Hence, the topics may be discussed briefly. However, questions may be asked from the topics for examination

#### 8. Extension of inflammation from gingiva

Mechanism of spread of inflammation from gingival area to deeper periodontal structures

Factors that modify the spread

#### 9. Pocket Definition, signs and symptoms, classification, pathogenesis, histopathology, root surface changes and contents of the pocket

#### 10. Etiology - Dental Plaque (Biofilm)

- Definition, New concept of biofilm

- Types, composition, bacterial colonization, growth, maturation & disclosing agents

- Role of dental plaque in periodontal diseases

- Plaque microorganisms in detail and bacteria associated with periodontal diseases

- Plaque retentive factors

- Materia alba

- Food debris

- Calculus

- Definition

- Types, composition, attachment, theories of formation

- Role of calculus in disease

Food Impaction

- Definition

- Types, Etiology

- Hirschfelds' classification

- Signs ,symptoms & sequelae of treatment

Trauma from occlusion

- Definition, Types

- Histopathological changes

- Role in periodontal disease

- Measures of management in brief

## Habits

- Their periodontal significance
- Bruxism & parafunctional habits, tongue thrusting, lip biting, occupational habits

## IATROGENIC FACTORS

### Conservative Dentistry

- Restorations
- Contact point, marginal ridge, surface roughness, overhanging restorations, interface between restoration and teeth

### Prosthodontics

- Interrelationship
- Bridges and other prosthesis, pontics(types), surface contour, relationships of margins to the periodontium,

Gingival protection theory, muscle action theory & theory of access to oral hygiene.

### Orthodontics

- Interrelationship, removable appliances & fixed appliances
- Retention of plaque, bacterial changes

### Systemic diseases

- Diabetes, sex hormones, nutrition (Vit. C & proteins)
- AIDS & periodontium
- Hemorrhagic diseases, Leukemia, clotting factor disorders, PMN disorders

11. Risk factors Definition. Risk factors for periodontal diseases 1

12. Host response - Mechanism of initiation and progression of periodontal diseases

- Basic concepts about cells, Mast cells, neutrophils, macrophages, lymphocytes, immunoglobulins, complement system, immune mechanisms & cytokines in brief
- Stages in gingivitis-Initial, early, established & advanced
- Periodontal disease activity, continuous paradigm, random burst & asynchronous multiple burst hypothesis

13. Periodontitis - Etiology, histopathology, clinical signs & symptoms, diagnosis and treatment of adult periodontitis

- Periodontal abscess; definition, classification, pathogenesis, differential diagnosis and treatment
- Furcation involvement, Glickmans' classification, prognosis and management

- Rapidly progressive periodontitis
- Juvenile periodontitis: Localized and generalized
- Post-juvenile periodontitis
- Periodontitis associated with systemic diseases
- Refractory periodontitis

14. Diagnosis - Routine procedures, methods of probing, types of probes,(According to case history)

- Halitosis: Etiology and treatment. Mention advanced diagnostic aids and their role in brief.

15. Prognosis - Definition, types, purpose and factors to be taken into consideration

16. Treatment plan - Factors to be considered

17. Periodontal therapy A. General principles of periodontal therapy. Phase I,II, III, IV therapy. Definition of periodontal regeneration, repair, new attachment and reattachment.

B. Plaque control

i. Mechanical tooth brushes, interdental cleaning aids, dentifrices

ii. Chemical; classification and mechanism of action of each & pocket irrigation

18. Pocket eradication procedures

- Scaling and root planing:

- Indications

- Aims & objectives

- Healing following root planning

- Hand instruments, sonic, ultrasonic & piezo-electric scalers

- Curettage & present concepts

- Definition

- Indications

- Aims & objectives

- Procedures & healing response

- Flap surgery

- Definition

- Types of flaps, Design of flaps, papilla preservation

- Indications & contraindications

- Armamentarium

- Surgical procedure & healing response

## 9. Osseous Surgery Osseous defects in periodontal disease

- Definition

- Classification

- Surgery: resective, additive osseous surgery (osseous grafts with classification of grafts)

- Healing responses

- Other regenerative procedures; root conditioning

- Guided tissue regeneration

## 20. Mucogingival surgery & periodontal plastic surgeries

Definition

Mucogingival problems: etiology, classification of gingival recession (P.D.Miller Jr. and Sullivan and Atkins)

Indications & objectives

Gingival extension procedures: lateral pedicle graft, frenectomy, frenotomy

Crown lengthening procedures

Periodontal microsurgery in brief

## 21. Splints - Periodontal splints

- Purpose & classification

- Principles of splinting

## 22. Hypersensitivity Causes, Theories & management 1

## 23. Implants Definition, types, scope & biomaterials used.

Periodontal considerations: such as implant-bone interface, implant-gingiva interface, implant failure, peri-implantitis & management

## 24. Maintenance phase (SPT)

- Aims, objectives, and principles

- Importance

- Procedures

- Maintenance of implants

## 25. Pharmaco-therapy - Periodontal dressings

- Antibiotics & anti-inflammatory drugs

- Local drug delivery systems

26. Periodontal management of medically compromised patients

Topics concerning periodontal management of medically compromised patients

27. Inter-disciplinary care - Pulpo-periodontal involvement

- Routes of spread of infection

- Simons' classification

- Management

28. Systemic effects of periodontal diseases in brief

Cardiovascular diseases, Low birth weight babies etc. 1

29. Infection control protocol Sterilization and various aseptic procedures 1

30. Ethics

#### TUTORIALS DURING CLINICAL POSTING;

1. Infection control

2. Periodontal instruments

3. Chair position and principles of instrumentation

4. Maintenance of instruments (sharpening)

5. Ultrasonic, Piezoelectric and sonic scaling – demonstration of technique

6. Diagnosis of periodontal disease and determination of prognosis

7. Radiographic interpretation and lab investigations

8. Motivation of patients- oral hygiene instructions

Students should be able to record a detailed periodontal case history, determine diagnosis, prognosis and plan treatment. Student should perform scaling, root planning local drug delivery and SPT. Shall be given demonstration of all periodontal surgical procedures.

#### DEMONSTRATIONS:

1. History taking and clinical examination of the patients

2. Recording different indices

3. Methods of using various scaling and surgical instruments

4. Polishing the teeth

5. Bacterial smear taking



6. Demonstration to patients about different oral hygiene aids
7. Surgical procedures- gingivectomy, gingivoplasty, and flap operations
8. Follow up procedures, post operative care and supervision

#### REQUIREMENTS:

1. Diagnosis, treatment planning and discussion and total periodontal treatment – 25 cases
2. Dental scaling, oral hygiene instructions – 50 complete cases/ equivalent
3. Assistance in periodontal surgery – 5 cases
4. A work record should be maintained by all the students and should be submitted at the time of examination after due certification from the head of the department.

Students should have to complete the work prescribed by the concerned department from time to time and submit a certified record for evaluation.

#### PRESCRIBED BOOK:

1. Glickman's Clinical Periodontology — Carranza

#### REFERENCE BOOKS

1. Essentials of Periodontology and periodontics- Torquil MacPhee
2. Contemporary periodontics- Cohen
3. Periodontal therapy- Goldman
4. Orbans' periodontics- Orban
5. Oral Health Survey- W.H.O.
6. Preventive Periodontics- Young and Stiffler
7. Public Health Dentistry- Slack
8. Advanced Periodontal Disease- John Prichard
9. Preventive Dentistry- Forrest
10. Clinical Periodontology- Jan Lindhe
11. Periodontics- Baer & Morris.

#### **Oral Implantology**

1. History of implants, their design & surface characteristics and osseo-integration

2. Scope of oral & maxillofacial implantology & terminologies
  3. A brief introduction to various implant systems in practice
  4. Bone biology, Morphology, Classification of bone and its relevance to implant treatment and bone augmentation materials.
  5. Soft tissue considerations in implant dentistry
  6. Diagnosis & treatment planning in implant dentistry  
Case history taking/Examination/Medical evaluation/Orofacial evaluation/ Radiographic evaluation/ Diagnostic evaluation/ Diagnosis and treatment planning/ treatment alternatives/  
Estimation of treatment costs/ patient education and motivation
  7. Pre surgical preparation of patient
  8. Implant installation & armamentarium for the Branemark system as a role model
  9. First stage surgery – Mandible – Maxilla
  10. Healing period & second stage surgery
  11. Management of surgical complications & failures
  12. General considerations in prosthodontic reconstruction & Bio mechanics
  13. Prosthodontic components of the Branemark system as a role model
  14. Impression procedures & Preparation of master cast
  15. Jaw relation records and construction of suprastructure with special emphasis on occlusion for osseointegrated prosthesis
  16. Management of prosthodontic complications & failures
  17. Recall & maintenance phase.
- Criteria for success of osseointegrated implant supported prosthesis

#### SUGGESTED BOOKS FOR READING

1. Contemporary Implant Dentistry - Carl .E. Misch Mosby 1993 First Edition.
2. Osseointegration and Occlusal Rehabilitation Hobo S., Ichida. E. and Garcia L.T. Quintessence Publishing Company, 1989 First Edition.

## **21. PROSTHODONTICS AND CROWN & BRIDGE**

### Complete Dentures

#### A. Applied Anatomy and Physiology.

1. Introduction
2. Biomechanics of the edentulous state.
3. Residual ridge resorption.

#### B. Communicating with the patient

1. Understanding the patients.

Ø Mental attitude.

2. Instructing the patient.

#### C. Diagnosis and treatment planning for patients-

1. With some teeth remaining.
2. With no teeth remaining.

a) Systemic status.

b) Local factor.

c) The geriatric patient.

d) Diagnostic procedures.

#### D. Articulators- discussion

#### E. Improving the patient's denture foundation and ridge relation -an overview.

a) Pre-operative examination.

b) Initial hard tissue & soft tissue procedure.

c) Secondary hard & soft tissue procedure.

d) Implant procedure.

e) Congenital deformities.

f) Postoperative procedure.

#### F. Principles of Retention, Support and Stability

#### G. Impressions - detail.

a) Muscles of facial expression.

b) Biologic considerations for maxillary and mandibular impression including anatomy landmark and their interpretation.

c) Impression objectives.

- d) Impression materials.
- e) Impression techniques.
- f) Maxillary and mandibular impression procedures.
  - i. Preliminary impressions.
  - ii. Final impressions.
- g) Laboratory procedures involved with impression making (Beading & Boxing, and cast preparation).
- H. Record bases and occlusion rims- in detail.
  - a) Materials & techniques.
  - b) Useful guidelines and ideal parameters.
  - c) Recording and transferring bases and occlusal rims.
- I. Biological consideration in jaw relation & jaw movements - craniomandibular relations.
  - a) Mandibular movements.
  - b) Maxillo -mandibular relation including vertical and horizontal jaw relations.
  - c) Concept of occlusion- discuss in brief.
- J. Relating the patient to the articulator.
  - a) Face bow types & uses– discuss in brief.
  - b) Face bow transfer procedure - discuss in brief.
- K. Recording maxillo mandibular relation.
  - a) Vertical relations.
  - b) Centric relation records.
  - c) Eccentric relation records.
  - d) Lateral relation records.
- L. Tooth selection and arrangement.
  - a) Anterior teeth.
  - b) Posterior teeth.
  - c) Esthetic and functional harmony.
- M. Relating inclination of teeth to concept of occlusion- in brief.
  - a) Neurocentric concept.
  - b) Balanced occlusal concept.
- N. Trial dentures.

O. Laboratory procedures.

- a) Wax contouring.
- b) Investing of dentures.
- c) Preparing of mold.
- d) Preparing & packing acrylic resin.
- e) Processing of dentures.
- f) Recovery of dentures.
- g) Lab remount procedures.
- h) Recovering the complete denture from the cast.
- i) Finishing and polishing the complete denture.
- j) Plaster cast for clinical denture remount procedure.

P. Denture insertion.

- a) Insertion procedures.
- b) Clinical errors.
- c) Correcting occlusal disharmony.
- d) Selective grinding procedures.

R. Treating problems with associated denture use – discuss in brief (tabulation/flow-chart form).

S. Treating abused tissues - discuss in brief.

T. Relining and rebasing of dentures- discuss in brief.

V. Immediate complete dentures construction procedure- discuss in brief.

W. The single complete denture- discuss in brief.

X. Overdentures denture- discuss in brief.

Y. Dental implants in complete denture - discuss in brief.

- Definition
- Diagnosis (of the particular situation/patient selection/treatment planning)
- Types / Classification
- Materials
- Methodology – Lab /Clinical
- Advantages & disadvantages
- Indications, contraindications
- Maintenance Phase

- Oral Implantology
- Ethics

## Removable Flexible Dentures

### 1. Introduction

Ø Terminologies and scope

### 2. Classification.

3. Examination, Diagnosis & Treatment planning & evaluation of diagnostic data.

4. Components of a removable partial denture.

Ø Major connectors,

Ø minor connectors,

Ø Rest and rest seats.

5. Components of a Removable Partial Denture.

Ø Direct retainers,

Ø Indirect retainers,

Ø Tooth replacement.

6. Principles of Removable Partial Denture Design.

7. Survey and design – in brief.

Ø Surveyors.

Ø Surveying.

Ø Designing.

8. Mouth preparation and master cast.

9. Impression materials and procedures for removable partial dentures.

10. Preliminary jaw relation and esthetic try-in for some anterior replacement teeth.

11. Laboratory procedures for framework construction-in brief.

12. Fitting the framework - in brief.

13. Try-in of the partial denture - in brief.

14. Completion of the partial denture - in brief.

15. Inserting the Removable Partial Denture - in brief.

16. Postinsertion observations.

17. Temporary Acrylic Partial Dentures.

18. Immediate Removable Partial Denture.

19. Removable Partial Dentures opposing Complete denture.

- Definition
- Diagnosis (of the particular situation /patient selection /treatment planning)
- Types / Classification
- Materials
- Methodology – Lab /Clinical
- Advantages & disadvantages
- Indications, contraindications
- Maintenance Phase

Fixed Partial Dentures

1. Introduction

2. Fundamentals of occlusion – in brief.

3. Articulators – in brief.

4. Treatment planning for single tooth restorations.

5. Treatment planning for the replacement of missing teeth including selection and choice of abutment teeth.

6. Fixed partial denture configurations.

7. Principles of tooth preparations.

8. Preparations for full veneer crowns – in detail.

9. Preparations for partial veneer crowns – in brief.

10. Provisional Restorations

11. Fluid Control and Soft Tissue Management

12. Impressions

13. Working Casts and Dies

14. Wax Patterns

15. Pontics and Edentulous Ridges

16. Esthetic Considerations

17. Finishing and Cementation

- Solder Joints and Other Connectors

- All - Ceramic Restorations
- Metal - Ceramic Restorations
- Preparations of intracoronal restorations.
- Preparations for extensively damaged teeth.
- Preparations for periodontally weakened teeth
- The Functionally Generated Path Technique
- Investing and Casting
- Resin - Bonded Fixed Partial Denture
  - Definition
  - Diagnosis(of the particular situation /patient selection /treatment planning)
  - Types / Classification
  - Materials
  - Methodology – Lab /Clinical
  - Advantages & disadvantages
  - Indications, contraindications
  - Maintenance Phase

#### RECOMMENDED BOOKS:

1. Syllabus of Complete denture by - Charles M. Heartwell Jr. and Arthur O. Rahn.
2. Boucher's "Prosthetic treatment for edentulous patients"
3. Essentials of complete denture prosthodontics by – Sheldon Winkler.
4. Maxillofacial prosthetics by – William R.Laney.
5. McCracken's Removable partial prosthodontics
6. Removable partial prosthodontics by – Ernest L. Miller and Joseph E. Grasso.

#### **Aesthetic Dentistry**

1. Introduction and scope of esthetic dentistry
2. Anatomy & physiology of smile
3. Role of the colour in esthetic dentistry
4. Simple procedures (rounding of central incisors to enhance esthetic appearance)
5. Bleaching of teeth



6. Veneers with various materials
7. Preventive and interceptive esthetics
8. Ceramics
9. Simple gingival contouring to enhance the appearance
10. Simple clinical procedures for BDS students

Recommended books:

1. Esthetic guidelines for restorative dentistry; Scharer & others
2. Esthetics of anterior fixed prosthodontics; Chiche (GJ) & Pinault (Alain)
3. Esthetic & the treatment of facial form, Vol 28; Mc Namara (JA)