

## ORAL MEDICINE AND RADIOLOGY

### Objectives:

At the end of 3 years of training the candidate should be able to acquire

### Knowledge:

Theoretical, Clinical and practical knowledge of all orofacial lesions, diagnostic procedures pertaining to them and latest information of imaging modules and recent advances in treatment modalities.

### Skills and Attitude:

Three important skills need to be imparted

1. Diagnostic skill in recognition of oral lesions and their management
2. Research skills in handling scientific problems pertaining to oral treatment
3. Clinical and Didactic skills in encouraging younger doctors to attain learning objectives

### Attitudes:

The positive mental attitude and the persistence of continued learning need to be inculcated

### Course Contents

#### Paper I:

##### Applied Anatomy

1. Gross anatomy of the face:
  - a. Muscles of Facial Expression and Muscles of Mastication
  - b. Temporomandibular Joint
  - c. Facial nerve
  - d. Facial artery
  - e. Facial vein
  - f. Major and Minor salivary glands
2. Neck region:
  - a. Triangles of the neck with special reference to Carotid, Digastric triangles and midline structures
  - b. Facial spaces
  - c. Carotid system of arteries, Vertebral Artery, and Subclavian arteries
  - d. Jugular system

Internal jugular

External jugular

- e. Lymphatic drainage
- f. Cervical plane
- g. Muscles derived from Pharyngeal arches
- h. Endocrine glands
- i Sympathetic chain
- j. Cranial nerves- V, VII, IX, XI, & XII.

3. Oral Cavity:

- a. Vestibule and oral cavity proper
- b. Tongue and teeth
- c. Palate -soft and hard

4. Nasal Cavity

- a. Nasal septum
- b. Lateral wall of nasal cavity

5. Pharynx:

6. Paranasal air sinuses

Gross salient features of brain and spinal cord with references to attachment of cranial nerves to the brainstem

Detailed study of the cranial nerve nuclei of V, VII, IX, X, XI, XII

Osteology: Comparative study of fetal and adult skull

Mandible: Maxilla frontal temporal & zygomatic bones.

Development, ossification, age changes and evaluation of mandible in detail

**Embryology**

1. Development of face, palate, nasal septum and nasal cavity, paranasal air sinuses
2. Pharyngeal apparatus in detail including the floor of the primitive pharynx
3. Development of tooth in detail and the age changes
4. Development of salivary glands
5. Congenital anomalies of face must be dealt in detail.
6. Development of the tongue.

**Histology:**

1. Study of epithelium of oral cavity and the respiratory tract

2. Connective tissue
3. Muscular tissue
4. Nervous tissue
5. Blood vessels
6. Cartilage
7. Bone and tooth
8. Tongue
9. Salivary glands
10. Tonsil, thymus, lymph nodes

### **Physiology:**

1. General Physiology:
  - a. Cell
  - b. Body Fluid Compartments
  - c. Classification
  - d. Composition
  - e. Cellular transport
  - f. RMP and action potential
2. Muscle Nerve Physiology
  - a. Structure of a neuron and properties of nerve fibers
  - b. Structure of muscle fibers and properties of muscle fibers
  - c. Neuromuscular transmission
  - d. Mechanism of muscle contraction

### **Blood**

1. RBC and Hb
2. WBC -Structure and functions
3. Platelets -functions and applied aspects
4. Plasma proteins
5. Blood Coagulation with applied aspects
6. Blood groups
7. Lymph and applied aspects

### **Respiratory System:**

1. Air passages, composition of air, dead space, mechanics of respiration with pressure and volume changes

2. Lung volumes and capacities and applied aspects
3. Oxygen and carbon dioxide transport
4. Neural regulation of respiration
5. Chemical regulation of respiration
6. Hypoxia, effects of increased barometric pressure and decreased barometric pressure

#### **Cardio-Vascular System:**

1. Cardiac Cycle
2. Regulation of heart rate/ Stroke volume / cardiac output / blood flow
3. Regulation of blood pressure
4. Anaphylaxis, hypertension, cardiac failure

#### **Excretory system**

1. Renal function tests

#### **Gastro- intestinal tract:**

1. Composition, functions and regulation of:
2. Saliva
3. Gastric juice
4. Pancreatic juice
5. Bile and intestinal juice
6. Mastication and deglutition

#### **Endocrine system:**

1. Hormones -classification and mechanism of action
2. Hypothalamic and pituitary hormones
3. Thyroid hormones
4. Parathyroid hormones and calcium homeostasis
5. Pancreatic hormones
6. Adrenal hormones

#### **Central Nervous System:**

1. Ascending tract with special references to pain pathway

#### **Special Senses:**

1. Gustation and Olfaction

### **Biochemistry**

1. **Carbohydrates -Disaccharides specifically maltose, lactose, sucrose**  
- Digestion of starch/absorption of glucose

- Metabolism of glucose, specifically glycolysis, TCA cycle, gluconeogenesis
- Blood sugar regulation
- Glycogen storage regulation
- Glycogen storage diseases
- Galactosemia and fructosemia ,

## **2. Lipids**

- Fatty acids – Essential / non essential
- Metabolism of fatty acids- oxidation, ketone body formation, utilization ketosis
- Outline of cholesterol metabolism- synthesis and products formed from cholesterol

## **3. Protein**

- Amino acids- essential/non essential, complete/ incomplete proteins
- Transamination/ Deamination (Definition with examples)
- Urea cycle
- Tyrosine – Hormones synthesized from tyrosine
- In born errors of amino acid metabolism
- Methionine and transmethylation

## **4. Nucleic Acids**

- Purines / Pyrimidines
- Purine analogs in medicine
- DNA / RNA – Outline of structure
- Transcription / translation
- Steps of protein synthesis
- Inhabitants of protein synthesis
- Regulation of gene functional

## **5. Minerals**

- Calcium / Phosphorus metabolism specifically regulation of serum calcium levels
- Iron metabolism
- Iodine metabolism
- Trace elements in nutrition

## **6. Energy Metabolism**

- Basal metabolic rate
- Specific dynamic action (SDA) of foods

## **7. Vitamins**

- Mainly these vitamins and their metabolic role-specifically vitamin A, Vitamin C, Vitamin D, Thiamin, Riboflavin, Niacin, Pyridoxine

### **Pathology :**

#### **1. Inflammation :**

- Repair and regeneration, necrosis and gangrene
- Role of complement system in acute inflammation
- Chronic inflammation
- Role of arachidonic acid and its metabolites in acute inflammation
- Growth factors in acute inflammation
- Role of molecular events in cell growth and intercellular signaling cell surface receptors
- Role of NSAIDs in inflammation
- Cellular changes in radiation injury and its manifestations

#### **2. Homeostasis**

- Role of Endothelium in thrombo -genesis
- Arterial and venous thrombi
- Disseminated Intravascular Coagulation

#### **3. Shock**

- Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock, circulatory disturbances, ischemic hyperemia, venous congestion, edema, infarction

#### **4. Chromosomal Abnormalities:**

- Marfan's syndrome
- Ehler's Danlos Syndrome
- Fragile X Syndrome

#### **5. Hypersensitivity:**

- Anaphylaxis
- Type II Hypersensitivity
- Type III Hypersensitivity
- Cell mediated Reaction and its clinical importance
- Systemic Lupus Erythmatosus
- Infection and infective granulomas

## **6. Neoplasia:**

- Classification of Tumors
- Carcinogenesis & Carcinogens -Chemical, Viral and Microbial
- Grading and Staging of Cancer, tumor Angiogenesis, Paraneoplastic Syndrome
- Spread of tumors
- Characteristics of benign and malignant tumors

## **7. Others:**

- Sex linked agammaglobulinemia
- AIDS
- Management of Immune deficiency patients requiring surgical procedures
- De George's Syndrome
- Ghons complex, post primary pulmonary tuberculosis - pathology and pathogenesis

## **Pharmacology:**

1. Definition of terminologies used
2. Dosage and mode of administration of drugs
3. Action and fate of drugs in the body
4. Drugs acting on the CNS
5. Drug addiction, tolerance and hypersensitive reactions
6. General and local anesthetics, hypnotics, analeptics, and tranquilizers
7. Chemotherapeutics and antibiotics
8. Analgesics and anti-pyretics
9. Antiseptics, sialogogues, and anti-sialogogues
10. Haematinics
11. Antacids
12. Antiviral drugs
13. Anti-diabetics
14. Vitamins -A B Complex, C, D, E, K
15. Steroids

## **Paper II: Oral and Maxillofacial Radiology**

### **Study includes Seminars / lectures / Demonstrations**

1. History of radiology, structure of x-ray tube, production of x-rays, properties of x-rays

2. Biological effects of radiation
3. Filtration of collimation, grids and units of radiation
4. Films and recording media
5. Processing of image In radiology
6. Design of x -ray department, dark room and use of automatic processing units
7. Localization by radiographic techniques
8. Faults of dental radiographs and concept of ideal radiograph
9. Quality assurance and audit in dental radiology
10. Extra -oral-imaging techniques
11. OPG and other radiologic techniques
12. Advanced imaging technique like CT Scan, MRI, Ultrasound & thermo graphy
13. Radionuclide techniques
14. Contrast radiography in salivary gland, TMJ, and other radiolucent pathologies
15. Radiation protection and ICRP guidelines
16. Art of radiographic report, writing and descriptors preferred in reports
17. Radiograph differential diagnosis of radiolucent, radio opaque and mixed lesions
18. Digital radiology and its advantages

**Paper III: Oral Medicine, therapeutics and laboratory investigations**

1. Study includes seminars / lectures / discussion
2. Methods of clinical diagnosis of oral and systemic diseases as applicable to oral tissue including modern diagnostic techniques
3. Laboratory investigations including special investigations of oral and oro -facial ; diseases
4. Teeth in local and systemic diseases, congenital, and hereditary disorders
5. Oral manifestations of systemic diseases
6. Oro -facial pain
7. Psychosomatic aspects of oral diseases
8. Management of medically compromised patients including medical emergencies in the dental practice.
9. Congenital and Hereditary disorders involving tissues of oro facial region
10. Systemic diseases due to oral foci of infection
11. Hematological, Dermatological, Metabolic, Nutritional, & Endocrinal conditions with oral manifestations



### 3. Performing basic CPR and certification by Red Cross

#### **3<sup>rd</sup> Year**

##### **All the above**

Performed independently –

- Case history: Routine cases -25
- Interesting Cases -25
- Intra -oral Radiographs -100
  - Periapical view -50
  - Bitewing view -25
  - Occlusal view -25
- Extra -oral radiographs of different views -50

##### **Monitoring Learning Progress**

It is essential to monitor the learning progress of each candidate through continuous appraisal. and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV.