

DS209- ORAL MEDICINE AND RADIOLOGY

INTRODUCTION

Oral Medicine and Radiology is unique in that it combines two different specialties Oral Medicine and Radiology. It sits at the interface between dentistry and medicine. It is a specialist clinical area of care for treating head and neck medical diseases. In some instances, mouth symptoms and signs reflect problems only in the mouth. However, in some cases mouth symptoms can suggest a connection with disease or problems in other parts of the body and it is the Oral Medicine specialist who can best decide what tests or investigations are needed in these situations. Conditions managed in Oral Medicine are often chronic and may have a significant psychological, as well as physical impact on the patient's quality of life. Some of these conditions also involve other diseases in the body, and in these cases the oral medicine specialist works as part of a multi-disciplinary patient care team

Oral Medicine is involved in patient care, teaching and research involving diagnosis and nonsurgical management of diseases of the orofacial complex and systemic and behavioral disorders that impact oral health.

This is where the UG students gain the ability to examine patients, diagnose issues and practice the clinical skills, vital to good dentistry.

OBJECTIVES

At the end of 3 years of training the candidate should be able to adequate knowledge of the discipline.

Part I

Paper I: Applied Basic Sciences

Applied Anatomy

1. Gross anatomy of the face:
 - a) Muscles of Facial Expression And Muscles Of Mastication
 - b) Facial nerve
 - c) Facial artery
 - d) Facial vein
 - e) Parotid gland and its relations
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) Infratemporal fossa in detail and temporomandibular joint
 - i) Endocrine glands

- Pituitary
- j) Sympathetic chain
- k) Cranial nerves- V, VII, IX, XI, & XII
 - Thyroid
 - Parathyroid
- l) Exocrine glands
 - Parotid
 - Thyroid
 - Parathyroid
- 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
 - c) Paranasal air sinuses
- 5. Pharynx:
 - a) Gross salient features of brain and spinal cord with references to attachment of cranial nerves to the brainstem
 - b) Detailed study of the cranial nerve nuclei of V, VII, IX, X, XI, XII
 - c) Osteology: Comparative study of fetal and adult skull
 - d) Mandible:
 - a. 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.

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:
 - Cell
 - Body Fluid Compartments
 - Classification
 - Composition
 - Cellular transport
 - RMP and action potential

MUSCLE NERVE PHYSIOLOGY:

1. Structure of a neuron and properties of nerve fibers
2. Structure of muscle fibers and properties of muscle fibers
3. Neuromuscular transmission
4. 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:

- Air passages, composition of air, dead space, mechanics of respiration with pressure and volume changes
- Lung volumes and capacities and applied aspects
- Oxygen and carbon dioxide transport
- Neural regulation of respiration
- Chemical regulation of respiration
- Hypoxia, effects of increased barometric pressure and decreased barometric pressure

CARDIOVASCULAR SYSTEM:

- Cardiac Cycle
- Regulation of heart rate/ Stroke volume / cardiac output / blood flow
- Regulation of blood pressure
- Shock, hypertension, cardiac failure

EXCRETORY SYSTEM:

- Renal function tests

Gastro - intestinal tract:

Composition, functions and regulation of:

- Saliva
- Gastric juice
- Pancreatic juice
- Bile and intestinal juice
- Mastication and deglutition

ENDOCRINE SYSTEM:

- Hormones - classification and mechanism of action
- Hypothalamic and pituitary hormones
- Thyroid hormones
- Parathyroid hormones and calcium homeostasis
- Pancreatic hormones
- Adrenal hormones

CENTRAL NERVOUS SYSTEM:

- Ascending tract with special references to pain pathway

SPECIAL SENSES:

- 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
- Inhibitors of protein synthesis
- Regulation of gene function

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

PHAMACOLOGY:

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, antiepileptics, and & tranquilizers
7. Chemotherapeutics and antibiotics
8. Analgesics and anti - pyretics
9. Anti - tubercular and anti - syphilitic drugs
10. Antiseptics, sialogogues, and anti - sialogogues
11. Haematinics
12. Anti - diabetics
13. Vitamins - A B Complex, C, D, E, K
14. Steroids

PART-II

PAPER-I: Oral and Maxillofacial Radiology

Study includes Seminars / lectures / Demonstrations

1. History of radiology, structure of x - ray tube, production of x - ray, property 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 & thermographic
13. Radio nucleotide 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 various types of advantages

PAPER-II: 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 chair
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
12. Neuromuscular diseases affecting oro-facial region
13. Salivary gland disorders
14. Tongue in oral and systemic diseases
15. TMJ dysfunction and diseases
16. Concept of immunity as related to oro-facial lesions, including AIDS
17. Cysts, Neoplasms, Odontomes, and fibro - osseous lesions
18. Oral changes in Osteo-dystrophies and chondro-dystrophies
19. Pre malignant and malignant lesions of oro-facial region
20. Allergy and other miscellaneous conditions
21. Therapeutics in oral medicine-clinical pharmacology
22. Forensic odontology
23. Computers in oral diagnosis and imaging
24. Evidence based oral care in treatment planning
25. Molecular Biology

PAPER-III- Descriptive and analysing type question**PROCEDURAL AND OPERATIVE SKILLS:****1st Year:**

- Examination of Patient
 - Case history recordings - 100
 - FNAC - 50
 - Biopsy (Scalpel/LASER) - 50
 - Observe, Assist, & Perform under supervision
- Management / Biopsy of benign soft tissue lesions using LASER - 05
 - Leukoplakia, OSMF, and Oral Lichen Planus
 - Irritational Fibroma, Pyogenic Granuloma
- Intra - oral radiographs:
 - Perform an interpretation - 500

2nd Year:

1. Dental treatment to medically compromised patients
 - Observe, assist, and perform under supervision
2. Extra - oral radiographs, digital radiography - 20
 - Observe, assist and perform under supervision
3. CBCT training and interpretation (Optional)
 - A 15 days training of MDS students in CBCT imaging and interpretation.
 - Students may be posted on rotation basis at an external radiologic center for CBCT training.
- Biopsy and Management of benign soft tissue lesions using LASER - 05

Operative skills:

1. Giving intra - muscular and intravenous injections
2. Administration of oxygen and life saving drugs to the patients
3. Performing basic CPR and certification by Red Cross

3rd Year

All the above

- Performed independently - Case history: Routine cases - 100
- Interesting Cases - 25
- Intra - oral Radiographs - 100
- Periapical view - 100
- Bitewing view - 50
- Occlusal view 50
- Extra - oral radiographs of different views – 100
- Biopsy and Management of benign soft tissue lesions using LASER - 05

Note: Laser ablation of potentially malignant disorders like leukoplakia and lichen planus will be performed by the PG students of Oral Medicine & Radiology under guidance of senior faculties (Reader

/ Professor) only. For the excisional biopsies of some soft tissue lesions which resembles like vascular lesions and laser removal of fibrous bands of OSMF will be performed with LASER by the PG students of Oral Medicine & Radiology under the guidance of a qualified Oral & Maxillofacial Surgeon in minor operation theatre. All these biopsies will be performed after routine haematological investigations like Complete blood count, bleeding time and clotting time and patients' consent only.

MINIMUM QUOTA FOR THE TEACHING AND LEARNING ACTIVITIES

- **Pre- Clinical work:**
 - Tracing of intraoral & extra oral radiographs
 - Radiographic age estimation
- **Seminars:**
 - 05 per year for each student
 - Two seminars weekly
- **Journal Clubs:**
 - 05 per year for each student
 - One journal club weekly
- **Clinical Case Presentations:**
 - 04 per year for each student
- **Teaching lectures:**
 - 01 per year for each student
 - The undergraduate teaching programs shall be conducted either in the form of lectures or group discussions.
- **Scientific Paper / Poster Presentations In State / National Level Conferences:**
 - 04 papers/posters during three years of training workshop period
- **Clinico-Pathological Conferences:**
 - 02 presentations during three years of training period
 - Clinico-pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments.
- **Scientific Publications (optional):**
 - 01 Publication in any indexed scientific journal
- **Rotation and Posting in other Departments:**
 - Rotatory postings of trainees in related disciplines (allied fields).
- **Submission of Synopsis:**
 - 01 Synopsis within six months from the date of commencement of the course.
- **Submission of Library Dissertation:**
 - 01 Dissertation within eighteen months from the date of commencement of the course.
- **Submission of Dissertation**
 - 01 Dissertation within six before appearing for the university examination.

EXAMINATIONS

The university examination shall consist of theory, practical and clinical examination and viva- voce and Pedagogy. A minimum of 50% marks in both theory & practical/clinical is required for a candidate to pass the examinations.

I. Theory Examination

- a. **Part – I: Basic Sciences** (One Paper): Applied Anatomy, Physiology, and Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.
 - i. There shall be a theory examination in the Basic Sciences at the end of 1st year of course.
 - ii. A candidate shall have to pass the Part-I examination at least six months prior to the final (Part-II) examination.
- b. **Part – II:** Shall consist of three papers, namely:
 - i. **Paper – I:** Oral and Maxillofacial Radiology
 - ii. **Paper – II:** Oral Medicine, therapeutics and laboratory investigations
 - iii. **Paper – III:** Descriptive and analysing type question

II. Practical Examination

- a. Practical and Clinical Examination
- b. Viva-voce
- c. Pedagogy

Practical: List of exercises with marks & time allotted for each:

1st Day

- a) Clinical case presentation (100 Marks)
 - i. 2 Spotters (2 x 20 = 40 Marks)
 - ii. 2 Short Cases (2 x 15 = 30 Marks)
 - iii. 1 Long Case (1 x 50 = 50 Marks)
- b) Radiology exercise (100 Marks)
 - i. 1 Intraoral radiograph (10 Marks)
 - ii. 1 Occlusal radiograph (30 Marks)
 - iii. 2 Extraoral radiographs (2 x 30 = 60 Marks)

2nd Day

3. Viva Voce: Duration of viva voce for each candidate: 1 Hour

Viva Voce: 100 marks**i. Viva-Voce examination: 80 marks**

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy Exercise: 20 marks

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

SCHEME OF EXAMINATION

Exam	Paper	Marks	Total
Theory	Part-I: Paper-I	100	400 Marks
	Part-II: Paper-I, Paper-II, Paper-III	100 each	

Practical	Practical and Clinical Examination	200	300 Marks
	Viva-voce and Pedagogy	100	
TOTAL MARKS			700 Marks

RECOMMENDED BOOKS

a. Oral Diagnosis, Oral Medicine

1. Burket's - 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. Shafers - Oral Pathology
9. Sonis. ST., Fazio.R.C., Fang. L - Principles and Practice of Oral Medicine
10. Differential diagnosis of oral lesions - Norman wood KW and Paul W. H Goaz 4th edition,1997, Mosby Philadelphia.
11. Hand book of medical emergencies in dental office by Malamed Stanley 3rd edition 1989,- AITBS, Mosby.
12. Orofacial pain, classification, diagnosis and management by Bell Welden, 4th edition 1989,year book Medical publishers, Chicago.
13. Oral & Maxillofacial Infections - Topazian Richard
14. Oral & Maxillofacial Pathology - Neville
15. Oral Pathology: Clinical-Pathologic Correlations by Regezi
16. Bricker- Oral Diagnosis, Oral Medicine and Treatment Planning
17. Davidson's Principles and Practice of Medicine
18. Jatin P Shah- Oral cancer
19. Medical problem in dentistry- Cawson & Scully
20. Bell's Orofacial pains
21. Bell's Temporomandibular disorders: classification, diagnosis, management
22. Management of Temporomandibular Disorders and Occlusion by Okeson

b. Oral Radiology

1. White & Goaz - Oral Radiology - Mosby Year Book
2. Wuehrmann - Dental radiology - C. V. Mosby Company
3. Stafne - Oral Roentgenographic Diagnosis - W.B. Saunders company
4. Fundamentals of oral medicine and radiology by Bailoor DN and Nagesh KS 1st and 2nd edition 1994, 2001. Contemporary dental publishers
5. Dental Radiography - Principles & Technique - Haring, Howerton
6. Essentials of Dental Radiography & Radiology - Eric Whaites
7. White and Pharoah- oral radiology

8. Langlais and Langland- Principles of Dental Imaging
9. Langlais and Langland - Diagnostic imaging of jaws
10. Langlais and Langland - Panoramic radiology
11. Christensen's Physics of Diagnostic Radiology
12. Aldrich J. Basic physics of ultrasound imaging. Crit Care Med 2007;35(5): 131-136
13. Allan Paul. Clinical ultrasound vol. 3rd ed. Churchill Livingstone.
14. Medical Imaging Physics, Fourth Edition, by William R. Hendee and E. Russell Ritenour.301-360.
15. C. R. Becker- Multislice CT, 3rd ed.
16. PET & PET-CT clinical guide by Eugene C Lin.
17. Magnetic resonance imaging. Physical principle & sequence by E. Mark Haacke.

c. Forensic Odontology

1. Derek H. Clark - Practical Forensic Odontology - Butterworth - Heinmann (1992)
2. C. Michel Bowers, Gary Bell - Manual of Forensic Odontology - Forensic Pr.(1995)

Recommended journals for reading

- Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology & Endodontology
- Journal of Oral Pathology & Medicine
- Oral Radiology
- Oral Diseases
- Journal of Oral & Facial Pain & Headache
- Dental Clinics of North America
- British Dental Journal
- Journal of American Dental Association
- Journal of Dental Education
- Journal of Dental Research
- Journal of Indian Academy of Oral Medicine & Radiology
- Indian Journal of Radiology & Imaging
- Indian Journal of Cancer
- Journal of Forensic Dental Sciences
- Journal of Oral & maxillofacial Pathology
- Indian Journal of Dental Research
- British Dental Journal
- Journal of Orofacial Pain
- Dentomaxillofacial Radiology