

FACULTY OF DENTAL SCIENCES
SANKALCHAND PATEL UNIVERSITY, VISNAGAR

DEPARTMENT OF ORAL MEDICINE & RADIOLOGY

SYLLABUS FOR PhD ENTRANCE TEST

APPLIED BASIC SCIENCES

I. General Human Anatomy

1. Anatomy of Face

- Muscles of Facial Expression, muscles of mastication.
- Vascular supply of face, neck and oral cavity.
- Nerve supply of face, neck and oral cavity.
- Lymphatic drainage of face, neck and oral cavity.
- Salivary glands and its relations.
- Cranial nerves - III, IV, V, VI, VII, IX, XI & XII and applied aspects.
- Facial spaces and their relations.
- TMJ & movements of mandible and applied aspects.
- Anatomy of paranasal sinuses and applied aspects.

2. Anatomy of Neck Region

- Triangles of the neck with a special reference to carotid, digastric triangles and facial spaces.
- Vascular supply, nerve supply & lymphatic drainage of neck.
- Salivary glands
- Anatomy of oral cavity, palate and applied aspects.
- Anatomy of tongue, teeth and applied aspects.
- Anatomy of nose & nasal cavity and applied aspects.

3. Embryology

- Growth & development of face and applied aspects.
- Growth & development of maxilla, mandible, palate and applied aspects.
- Growth & development of tooth, hard tissues of teeth and applied aspects.
- Growth & development of tongue and applied aspects.
- Congenital anomalies of face, jaws, teeth and other parts of above mentioned.

4. Histology

- Structure of cell.
- Study of epithelium (skin and oral mucous membrane) connective tissue including cartilage, bone, muscle, nerves and nerve ganglion.
- Tooth and stages of development of tooth, hard tissues, soft tissues and supporting structures of tooth.

II. General Human Physiology

- Structure of cell and cellular transport across cell membrane.
- Structure of Muscle and properties of muscle fibers.
- Structure of nerve, neuron and properties of nerve fibers.
- Neuromuscular transmission and muscle contraction.
- Blood composition, functions, plasma proteins, coagulation of blood, cells of blood and blood groups.
- Body fluid, lymph, lymph gland, spleen and reticulo-endothelial system.

1. Cardiovascular system

- ECG, cardiac cycle, heart rate, heart sounds, cardiac output and blood pressure.
- Circulatory shock, hypertension, cardiac failure.

2. Respiratory system

- Physiology of respiration, functional anatomy of respiratory passage & lungs, mechanism of respiration with pressure and volume changes.
- Pulmonary ventilation, composition of air and exchange of gases.
- Oxygen and carbon dioxide transport, regulation of respiration.
- Hypoxia, cyanosis, dyspnoea and periodic breathing.
- Artificial respiration and pulmonary function tests.

3. Digestive system

- General structure of GI tract and innervations.
- Structure of salivary glands, saliva composition, regulation of secretion of saliva, functions of saliva, mastication and deglutition.
- Stomach, gastric juice, mechanism and regulation of gastric secretion.
- Pancreas, structure, pancreatic juice and regulation.
- Structure of intestine, liver, gall bladder, composition of intestinal juice, bile and regulation.

4. Endocrine system

- Endocrine glands and classification.
 - Hormones and mechanism of action, regulation and disorders of secretion.
 - Pituitary gland, thyroid, adrenal gland, parathyroid gland & other hormones.
 - Calcium Homeostasis.

5. Central nervous system

- Physiology of pain and pain pathways.
- Autonomic nervous system (Sympathetic and Parasympathetic).

- Taste- taste buds ,primary taste sensation
- 6. Excretory system
- Structure, function of kidney and regulation of micturition.
- 7. Metabolism
- Carbohydrate, protein, fat and mineral metabolism.
- 8. Vitamins
- Fat soluble vitamins, water soluble vitamins and normal diet.
- 9. Special senses
- Fundamental knowledge of vision, hearing, touch, taste and smell.

III. Oral Physiology

1. Saliva, mastication, deglutition.
2. Calcium, Phosphorous and Fluoride metabolism.
3. Theories of mineralization.
4. Effects of hormones on oral structures.
5. Effects of vitamins and minerals on oral structures.
6. Physiology of taste
7. Physiology of speech.

IV. Biochemistry

1. Carbohydrates and metabolism.
2. Blood sugar and glycogen regulation.
3. Urea cycle.
4. Nucleic acids.
5. Structure of DNA/RNA.
6. Minerals.
7. Ca / P metabolism and regulation of calcium levels.
8. Iron metabolism, iodine metabolism and trace elements in nutrition.
9. BMR.
10. Enzymes and metabolic regulation.
11. Vitamins.

V. General Pathology

1. Introduction to Pathology: etiology and pathogenesis of disease.
2. Inflammation; acute and chronic.
3. Cell in health, cell injury, degeneration and cell death.
4. Healing; repair, regeneration.
5. Role of NSAIDS in inflammation.
6. Oedema, hyperemia and shock.
7. Atrophy, hypertrophy, hyperplasia, metaplasia and dysplasia.
8. Thrombosis, embolism, ischaemia and infarction.
9. Necrosis and gangrene.
10. Hypersensitivity.
11. Anaphylaxis, Type II, Type III and cell mediated hypersensitivity.
12. Infectious Diseases: Bacterial, Viral and Fungal.
13. AIDS and Hepatitis.
14. Neoplasia
 - a) Classification of tumors.
 - b) Benign and malignant tumors.
 - c) Carcinogenesis, carcinogens and metastasis.
 - d) Grading and staging of cancer.
 - e) Precancerous lesions and conditions

VI. Pharmacology

1. General pharmacology
 - a) Definitions- pharmacokinetics with clinical applications, routes of administration including local drug delivery in periodontics
 - b) Adverse drug reactions and drug interactions
2. Detailed pharmacology of:
 - a) Analgesics- opioid and non opioid
 - b) Local anaesthetics
 - c) Hematinics and coagulants, anti-coagulants
 - d) Vitamin D and calcium preparations
 - e) Anti diabetic drugs
 - f) Steroids
 - g) Antibiotics
 - h) Antihypertensive
 - i) Immunosuppressive drugs and their effects on oral tissue
 - j) Antiepileptic drugs

3. Brief pharmacology, dental use and adverse effects of –

- a) General anesthetics
- b) Anti-psychotics
- c) Anti- depressants
- d) Anxiolytic drugs
- e) Sedatives
- f) Anti epileptics
- g) Anti-hypertensives
- h) Anti-anginal drugs
- i) Diuretics
- j) Hormones
- k) Pre-anesthetic medications

4. Drugs used in bronchial asthma, cough

5. Drug therapy of-

- a) Emergency
- b) Seizures
- c) Anaphylaxis
- d) Bleeding
- e) Shock
- f) Diabetic ketoacidosis
- g) Acute Addisonian crisis

6. Dental pharmacology

- a) Antiseptics
- b) Astringents
- c) Sialogogues
- d) Disclosing agents
- e) Antiplatelet agents

VII. Microbiology

1. General bacteriology

- a) Identification of bacteria
- b) Culture media and methods
- c) Sterilization and disinfection

2. Immunology and infection

3. Systemic bacteriology with special emphasis on oral microbiology- staphylococci genus actinomyces , and other filamentous bacteria and actinobacillus actinomycetum comitans

4. Virology

- a) General properties of viruses

- b) Herpes, hepatitis virus. Hiv virus
- 5. Mycology
 - a) Candidiasis
- 6. Applied microbiology
- 7. Diagnostic microbiology and immunology, hospital infections and management

VIII. Applied Oral Pathology & Oral Microbiology

1. Developmental disturbances of teeth jaws & soft tissues of oral & paraoral structures.
2. Dental caries.
3. Diseases of pulp and sequel of pulpitis.
4. Regressive alterations of teeth.
5. Diseases of periodontium.
6. Spread of oral infection.
7. Microbial infections of oral cavity.
8. Bacterial, viral and mycotic.
9. Healing of oral wounds.
10. Cysts and tumors of odontogenic origin.
11. Benign and malignant tumors of the oral cavity.
12. Tumors of salivary glands
13. Physical and chemical injuries of oral cavity.
14. Traumatic reactive lesions of oral cavity.
15. Pigmentation of oral and paraoral region.
16. Oral cancer and pre-cancer of oral cavity.
17. Oral aspects of metabolic diseases.
18. Diseases of bones and joints.
19. Diseases of the blood and blood forming organs.
20. Diseases of skin.
21. Diseases of the nerves and muscles.
22. Miscellaneous diseases effecting oral cavity.
23. Forensic Odontology.

ORAL AND MAXILLOFACIAL RADIOLOGY

1. Radiation Physics

- a) Nature of radiation, composition of matter.
- b) X-ray tube, production of X-ray, properties of X-rays, X - ray machine.
- c) Factors controlling X - ray beam, interaction x - rays with matter.
- d) Dosimetry.
- e) Biological effects of radiation.
- f) Radiation safety and protection.
- g) X - Ray films and properties, intensifying screens and grids.
- h) Projection geometry.
- i) Processing of image in radiology.
- j) Design of X-ray department, dark room and automatic processing units.
- k) Radiographic quality assurance and infection control.
- l) Intra-oral radiographic techniques.
- m) Extra-oral imaging techniques.
- n) Specialized extra oral techniques.
- o) OPG and other radiological techniques.
- p) Normal radiographic anatomy.
- q) Faulty radiographs and concept of ideal radiograph.
- r) Localization of object by radiographic techniques.
- s) Advanced imaging technique like CT scan, MRI, ultrasound & thermographic.
- t) Digital radiography and its various advantages.
- u) Radio nucleotide imaging.
- v) Contrast radiography in salivary gland, TMJ and other radiolucent pathologies.
- w) Guidelines for prescribing dental radiographs.
- x) Principles of radiographic interpretation.

2. Radiographic interpretation

- a) Dental Caries, periodontal diseases, regressive changes of teeth.
- b) Differential diagnosis of periapical, pericoronal and interradicular radiolucencies.
- c) Differential diagnosis of solitary and multilocular radiolucencies.
- d) Differential diagnosis of generalized rarefactions of the bones.
- e) Differential diagnosis of mixed radiolucent and radiopaque lesions of the jaws.
- f) Differential diagnosis of periapical and solitary radiopacities.
- g) Differential diagnosis of multiple separate and generalized radiopacities.
- h) Diseases on Paranasal sinuses and TMJ.
- i) Art of radiographic report, writing and descriptors preferred in reports.

ORAL MEDICINE, THERAPEUTICS AND LABORATORY INVESTIGATIONS

1. Scope of Oral Medicine.
2. Case history taking.
3. Primary lesions and secondary lesions.
4. Laboratory investigations including special investigations of oral and oro-facial diseases.
5. Psychosomatic aspects of oral diseases.
6. Spread of infection and oral foci of infection.
7. Infectious diseases affecting oral cavity.
8. Congenital and hereditary disorders involving tissues of oro-facial region.
9. Ulcerative, vesicular and bullous lesions of oral mucosa.
10. Red and white lesions of oral mucosa.
11. Pigmented lesions of oral mucosa.
12. Benign tumors of oral cavity.
13. Oral cancer and precancer.
14. Oro-facial pain.
15. Haematological, dermatological, metabolic, nutritional & endocrinal diseases with oral manifestations.
16. Management of medical emergencies in dental chair.
17. Management of medically compromised patients with diseases of CVS.
18. Management of medically compromised patients with renal disease.
19. Management of medically compromised patients with bleeding & clotting disorders.
20. Management of medically compromised patients with hematologic Disease.
21. Management of medically compromised patients with diseases of respiratory tract.
22. Management of medically compromised patients with diseases of GIT.
23. Management of medically compromised patients with immunologic disease.
24. Management of medically compromised patients with DM.
25. Management of medically compromised patients with endocrine disease.
26. Salivary gland disorders.
27. Tongue in health and disease.
28. TMJ disorders.
29. Concept of immunity as related to oro-facial region, including AIDS.
30. Cysts and tumors of odontogenic origin and fibro-osseous lesions.
31. Oral changes in diseases of bones.
32. Allergy and other miscellaneous conditions.
33. Therapeutics in oral medicine - clinical pharmacology.
34. Forensic Odontology.
35. Computers in oral diagnosis and imaging.
36. Evidence based oral care in treatment planning.

37. Molecular biology.

38. Geriatrics.

BIOSTATISTICS

1. Introduction, definition, and branches of biostatistics
2. Collection of data. Sampling, types ,bias and errors
3. Compiling data graphs and charts
4. Measures of central tendency(mean ,median and mode), standard deviation and variability
5. Test of significance (chi square test, “t” test and “z” test)
6. Null hypothesis