

Syllabus for Ph.D. Entrance Examination

In

Conservative Dentistry and Endodontics

Applied Anatomy Of Head And Neck:

Development of face, paranasal sinuses and the associated structures and their anomalies, cranial and facial bones, TMJ anatomy and function, arterial and venous drainage of head and neck, muscles of face and neck including muscles of mastication and deglutition, brief consideration of structures and function of brain. Brief consideration of all cranial nerves and autonomic nervous system of head and neck. Salivary glands, Functional anatomy of mastication, deglutition and speech. Detailed anatomy of deciduous and permanent teeth, general, consideration, in physiology of permanent dentition, form, function, alignment, contact, occlusion.)

Internal anatomy of permanent teeth and its significance

Applied histology - histology of skin, oral mucosa, connective tissue, bone cartilage, blood vessels, lymphatics, nerves, muscles, tongue.

Development Of Teeth:

- Enamel - development and composition, physical characteristics, chemical properties, structure.
- Age changes - clinical structure
- Dentin - development, physical and chemical properties, structure type of dentin, innervations, age and functional changes.
- Pulp - development, histological structures, innervations, functions, regressive changes, clinical considerations.
- Cementum - composition. cementogenesis, structure, function, clinical consideration.
- Periodontal ligament - development, structure, function and clinical consideration.
- Salivary glands - structure, function, clinical considerations.
- Eruption of teeth.

Applied Physiology:

- Mastication, deglutition, digestion and assimilation; fluid and electrolyte balance.
- Blood composition, volume, function, blood groups, haemostasis, coagulation, blood transfusion, circulation, heart, pulse, blood pressure, shock, respiration, control, anoxia, hypoxia, asphyxia, artificial respiration, and endocrinology- general principles of endocrine activity and disorders relating to pituitary, thyroid, parathyroid, adrenals including pregnancy and lactation.

- Physiology of saliva - composition, function, clinical significance.
- Clinical significance of vitamins, diet and nutrition - balanced diet.
- Physiology of pain, sympathetic and Para sympathetic nervous system, pain pathways, Physiology of pulpal pain, Odontogenic and non Odontogenic pain, pain disorders – typical and atypical, biochemistry such as osmotic pressure, electrolytic dissociation, oxidation, reduction etc. Carbohydrates, proteins, lipids and their metabolism, nucleoproteins, nucleic acid and their metabolism. Enzymes, vitamins and minerals, metabolism of inorganic elements, detoxification in the body, anti metabolites, chemistry of blood lymph and urine,

Pathology:

- Inflammation, repair, degeneration, necrosis and gangrene.
- Circulatory disturbances - ischemia, hyperemia, edema, thrombosis, embolism, infarction, allergy and hypersensitivity reaction.
- Neoplasms - classifications of tumors, characteristics of benign and malignant tumors, spread tumors.
- Blood dyscrasias
- Developmental disturbances of oral and Para oral structures, dental caries, regressive changes of teeth. pulp, periapical pathology, pulp reaction to dental caries and dental procedures.
- Bacterial, viral, mycotic infections of the oral cavity.

Microbiology:

- Pathways of pulpal infection, oral flora and micro organisms associated with endodontic diseases, pathogenesis, host defense, bacterial virulence factors, healing, theory of focal infections, microbes or relevance to dentistry - strepto, staphylococci, lactobacilli, cornyebacterium, actinomycetes, clostridium, neisseria, vibrio, bacterioids, fusobacteria, spirochetes, mycobacterium, virus and fungi.
- Cross infection, infection control, infection control procedure, sterilization and' disinfection.
- Immunology - antigen antibody reaction, allergy, hypersensitivity and anaphylaxis, auto immunity, grafts, viral hepatitis, HIV infections and aids. Identification and isolation of
- microorganisms from infected root canals. Culture medium and culturing technique (Aerobic and anaerobic interpretation and antibiotic sensitivity test).

Pharmacology:

- Dosage and route of administration of drugs, actions and fate of drug in body, drug addiction,

tolerance of hypersensitivity reactions.

- Local anesthesia - agents and chemistry, pharmacological actions, fate and metabolism of anaesthetic, ideal properties, techniques and complications.
- General anesthesia - pre medications, neuromuscular blocking agents, induction agents, inhalation anesthesia. and agents used, assessment of anesthetic problems in medically compromised patients.
- Anaesthetic emergencies
- Antihistamines, corticosteroids, chemotherapeutic and antibiotics, drug resistance, haemostasis, and haemostatic agents, anticoagulants, sympathomimetic drugs, vitamins and minerals (A, B, C, D, E, K IRON), anti sialogogue, immunosuppressants, drug interactions, antiseptics, disinfectants, anti viral agents, drugs acting on CNS

Biostatistics:

- Introduction, Basic- concepts, Sampling, Health information systems - collection, compilation, presentation of data. Elementary statistical methods - presentation of statistical data, Statistical averages - measures of central tendency, measures of dispersion, Normal distribution, Tests of significance - parametric and non -parametric tests (Fisher exact test, Sign test, Median test, Mann Whitney test, Kruskal Wallis one way analysis, Friedman two way analysis, Regression analysis), Correlation and regression, Use of computers.

Research Methodology:

- Essential features of a protocol for research in humans
- Experimental and non-experimental study designs
- Ethical considerations of research

Applied Dental Materials:

- Physical and mechanical properties of dental materials, biocompatibility.
- Impression materials, detailed study of various restorative materials, restorative resin and recent advances in composite resins, bonding- recent developments- tarnish and corrosion, dental amalgam, direct filling gold, casting alloys, inlay wax, die materials, investments, casting procedures, defects, dental cements for restoration and pulp protection (luting, liners, bases) cavity varnishes.
- Dental ceramics-recent advances, finishing and polishing materials.
- Dental burs -: design and mechanics of cutting- other modalities of tooth preparation.
- Methods of testing biocompatibility of materials used.

Conservative Dentistry:

- Examination, diagnosis and treatment plan
- Occlusion as related to conservative dentistry, contact, contour, its significance. Separation of teeth, matrices, used in conservative dentistry.
- Dental caries- epidemiology, recent concept of etiological factors, pathophysiology, Histopathology, diagnosis, caries activity tests, prevention of dental caries and management - recent methods.
- Hand and rotary cutting instruments, development of rotary equipment, speed ranges, hazards.
- Dental burs and other modalities of tooth reparation- recent developments (air abrasions, lasers etc.)
- Infection control procedures in conservative dentistry, isolation equipments etc.
- Direct concepts in tooth preparation for amalgam, composite, GIC and restorative techniques, failures and management.
- Direct and indirect composite restorations.
- Indirect tooth colored restorations- ceramic, inlays and onlays, veneers, crowns, recent advances in fabrication and materials.
 - Tissue management
- Impression procedures used for indirect restorations.
- Cast metal restorations, indications, contraindications, tooth preparation for class 2 inlay, Onlay full crown restorations. Restorative techniques, direct and indirect methods of fabrication including materials used for fabrication like inlay wax, investment materials
- Direct gold restorations.
- Recent advances in restorative materials and procedures.
- Management of non-carious lesion.
- Advance knowledge of minimal intervention dentistry.
- Recent advances in restoration of endodontically treated teeth and grossly mutilated teeth
- Hypersensitivity, theories, causes and management.
- Lasers in Conservative Dentistry
- CAD·CAM&CAD-CIM in restorative dentistry
- Dental imaging and its applications in restorative dentistry (clinical photography)
- Principles of esthetics
 - Color

- Facial analysis
- Smile design
- Principles of esthetic integration
- Treatment planning in esthetic dentistry

Endodontics:

- Rationale of endodontics.
- Knowledge of internal anatomy of permanent teeth, anatomy of root apex and its implications in endodontic treatment.
- Dentin and pulp complex.
- Pulp and periapical pathology 5. Pathobiology of periapex.
- Diagnostic procedure - recent advances and various aids used for diagnosis.
 - Orofacial dental pain emergencies: endodontic diagnosis and management
- Case selection and treatment planning .
- Infection control procedures used in Endodontics (aseptic techniques such as rubber dam, sterilization of instruments etc.)
- Access cavity preparation - objectives and principles
- Endodontic instruments and instrumentation - recent developments, detailed description of hand, rotary, sonic, ultra sonic etc .
- Working length determination I cleaning and shaping of root canal system and recent development in techniques of canal preparation.
- Root canal irrigants and intra canal medicaments used including non – surgical Endodontics by calcium hydroxide.
- Endodontic microbiology.
- Obturating materials, various obturation techniques and recent advances in obturation of root canal.
- Traumatic injuries and management - endodontic treatment for young permanent teeth. Pediatric Endodontics - treatment of immature apex.
- Endodontic surgeries, recent developments in technique and devices, endosseous endodontic implants - biology of bone and wound healing.
- Endoperio interrelationship. endo + Perio lesion and management.
- Drugs and chemicals used in Endodontics
- Endo emergencies and management.

- Restoration of endodontically treated teeth, recent advances.
- Geriatric Endodontics
- Endo emergencies and management.
- Biologic response of pulp to various restorative materials and operative procedures.
- Lasers in Endodontics.
- Multidisciplinary approach to endodontics situations.
- Endodontics radiology-digital technology in endodontics practice.
- Local anesthesia in endodontics.
- Procedural errors in endodontics and their management.
- Endodontics failures and retreatment,
- Resorptions and its management.
- Microscopes in endodontics.
- Single visit endodontics, current concepts and controversies.