

THEMES FOR PhD SYLLABUS

JULY 2021

Theme-1	Applied Basic Sciences.
Theme-2	Materials used in Dentistry.
Theme-3	Restorative procedures performed on teeth
Theme-4	Endodontic procedures performed on teeth
Theme-5	Recent advances in restorative materials, restorative procedures and endodontics.

THEME 1: APPLIED BASIC SCIENCES

APPLIED ANATOMY OF HEAD & NECK

Apply the knowledge development of face, paranasal sinuses and the associated structures and their anomalies, cranial and facial bone in clinical setting. Be able to describe TMJ anatomy and functions, arterial and venous drainage of head and neck, muscles of face and neck including muscles of mastication and deglutition. Be able to recognize the structures and function of brain. Understanding and Utilization the knowledge of Salivary glands, functional anatomy of mastication, deglutition and speech in patient care. Illustrate the detail anatomy of deciduous and permanent teeth and its general consideration in physiology of permanent dentition, from function, alignment, contact, occlusion. Diagnosis and management of disease related to permanent teeth. Have and apply a knowledge of Internal anatomy of permanent teeth and able to apply in clinical situations. Applied histology-histology of skin oral mucosa, connective tissue, bone cartilage, blood vessels, lymphatics, nerves, muscles, tongue.

DEVELOPMENT OF TEETH:

Illustrate and Understanding the basic concept of Enamel-development, composition, physical characteristics, chemical properties, structure. Diagnosis and treatment planning of developmental disease of Enamel. Recognize age related changes and its clinical structure. Utilized the Knowledge of Dentin-developmental, its physical and chemical properties, structure type of dentin, innervations, age and functional changes. Diagnosis and treatment planning of developmental disease of dentine. Apply the knowledge of the Pulp development, histological structures, innervations, functions, regressive changes and its clinical considerations. Management of pulpal and periradicular diseases
Introduction of calcium phosphate based materials

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, artificial respiration. Endocrinology- general principles of endocrine activity and disorders relating to pituitary, thyroid, parathyroid adrenals including pregnancy and lactation. Physiology and 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.

APPLIED BIOCHEMISTRY

Carbohydrate, 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.

APPLIED PATHOLOGY

Inflammation, repair, degeneration, necrosis and gangrene. Circulatory disturbances, ischemia, hyperemia, edema, thrombosis, embolism, infarction, allergy and hypersensitivity reaction. Neoplasm:- classification of tumors, characteristic of benign and malignant tumors, spread tumors. Blood dyscrasia. 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, micotic infections of the oral cavity.

APPLIED MICROBIOLOGY

Pathways of pulpal infections, oral flora and micro organism associated with endodontic, pathogenesis, host defense, bacterial virulent factor, healing, and theory of focal infection, microbes or relevance to dentistry. Strepto, saphylo, lactobacilli, corny bacterium, actinomycosis, clostridium, nisseria, vibrio, spirocates, mycobacterium, virus and fungi. Cross infection, infection control, infection control procedures, sterilization and disinfections. Body reaction, allergy, hypersensitivity and anaphylaxis, auto immunity, grafts, viral hepatitis, HIV infections and AIDS. Identification and isolation of microorganism from infected root canals. cultures medium. Immunology antigen and 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)

APPLIED PHARMACOLOGY

Dosage and routes of administration of drugs, action and fate of drug in body, drug addition, tolerance of hypersensitivity reactions. Local anesthesia agents and chemistry, pharmacological actions, fate and metabolism of anesthetic, ideal properties, technique and complications. General anesthesia pre medications, neuro-muscular blocking agents, induction agents, inhalation anesthesia, and agents used. assessment of anesthetic problems in medically compromised patients. Anesthetic 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, immunosupresants, drug interactions, antiseptics, disinfectants, and viral agents, drugs acting on CNS.

THEME 2 APPLIED DENTAL MATERIALS:-

Knowledge of Physical and chemical properties of dental materials, its biocompatibility. Knowledge of the following materials and its application in clinical situations . Impression materials. Details study of various restorative materials, restorative resin . Recent advances in composite resins. Bonding recent development. Tarnish and corrosion. Dental amalgam. Direct filling gold. Casting alloy, 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. Introduction of Nanorobotics in dental materials. Introduction of calcium phosphate based materials

THEME 3 : RESTORATIVE PROCEDURES PERFORMED ON TEETH

Utilize the knowledge in the basic of examination, diagnosis and treatment plan. Apply knowledge regarding occlusion, contact, contour, its significance. Separation of teeth matrices used in conservative dentistry . Utilize the knowledge of dental caries its historical prospective, epidemiology, and awareness of recent concept of etiological factors, Pathophysiology, histopathology, diagnosis, able to perform caries activity tests, prevention of dental caries and management of recent methods. Application of knowledge of hand and rotary instruments, and development of rotary equipment, speed ranges, hazards and able to apply its knowledge in clinical practice. Illustrate knowledge of Dental burs and other modalities of tooth preparation and recent developments (air abrasions, lasers etc) and able to apply its knowledge in clinical practice. Application of Knowledge of sterilization technique and Infection control procedures in conservative dentistry and its application in routine practice. Utilize the knowledge of tooth preparations for amalgams, composite, GIC and restorative techniques, failures and able to manage in clinical scenario. Apply the knowledge of Direct and indirect composites restorations and able to manage in clinical scenario. Appraise the knowledge of Indirect tooth color restoration ceramic, inlay and onlays, veneers crowns, and utilization of recent advances in fabrications and material and tissue management. Able to perform Impression procedures used for indirect restoration. Correlate the knowledge of Cast metals restoration material with clinical situation and illustrate indication ,contraindications, and perform tooth preparation for class II inlay, onlay full crown preparation ,restoration techniques , direct indirect method of fabrication including materials used for fabrication like inlay wax, investment material . Knowledge of historical aspects of direct gold restorations. Appraise the knowledge of recent advancements in restorative material and utilize procedures. Able to manage non carious lesion. Advancement in knowledge of minimal intervention dentistry. Able to perform restoration of endodontically treated and grossly mutilated teeth Knowledge of Hypersensitivity, illustrate theories, causes and able to manage in clinical scenario. Knowledge of lasers in conservative dentistry. Knowledge of CAD-CAM in restorative dentistry. CAD-CAM based posterior composites. Knowledge of basic of dental imaging and its application in restoration dentistry. Illustrate principles of aesthetics Colour Facial

analysis Smile design Principal of aesthetic integration Treatment planning in aesthetic dentistry.

THEME 4 : ENDODONTIC PROCEDURE PERFORMED ON TEETH

Apply the knowledge of rationale of endodontic. Appraise the knowledge of internal anatomy of permanent teeth, and anatomy of root apex and its implications in endodontic treatment. Application of knowledge dentin pulp complex. Understand the basic concept of Pulp and periapical pathology and able to apply its knowledge in clinical practice. Understand the basic concept of Pathology of periapex and able correlate in treatment modalities. Illustrate Diagnostic procedure- recent advances and utilize various aids used for diagnosis. Identify Case selection, differentiate and justify treatment planning. Application of Knowledge of sterilisation technique and Infection control procedures used in endodontics(aseptic techniques such as rubber dam, sterilization. Application of Knowledge of basic principle of Access cavity preparation. Able to illustrate objectives and principles. Illustrate knowledge of Endodontic instruments and instrumentation. Appraise recent developments and detailed description of hand, sonic, ultra sonic etc. Appraise the knowledge of root canal irritants and inter canal medicaments and its application in clinical practice. Application of knowledge in Working length determination, cleaning and shaping of root canal system and recent development in techniques of canal preparation. Appraise the knowledge of Endodontic microbiology. Illustrate Obturating materials, various obturation techniques and appraise recent advances in obturation of root canal. Diagnosis and management of Traumatic injuries for pediatrics and adult patients . Able to perform Endodontics surgery and aware of recent development in technique and devices, Recognize endo-perio interrelationship and its management. Knowledge of Drugs and chemicals used in endodontics. Able to recognise Endodontics emergencies for its management in clinical practice. Design the plan of Restoration of endodontically treated teeth and its recent advance. Be able to communicate and manage appropriately with Geriatric patients. Illustrate Biologic response of pulp to various restorative materials and operative procedures. Knowledge of basic principles of Lasers in endodontics. Multidisciplinary approach to endodontics situations. Understanding Basic principles of Endodontics radiology Use of CBCT in multidisciplinary approach in endodontics. Understanding different technique of Local anaesthesia in endodontics. Able to understand Procedural errors in endodontics and their managements Recognize Endodontic failures and perform retreatment. Be able to diagnose and treat Resorption. Knowledge and utilization Microscopes in endodontics To understand Basic principles of Single visit endodontics and analyses current concepts and controversies.

THEME 5: RECENT ADVANCES IN RESTORATIVE MATERIALS, RESTORATIVE PROCEDURES AND ENDODONTICS.

Dental caries. Dental bur. Isolation. Fundamental of cavity preparation for amalgam , composite. Anterior composite restoration. Post composite restoration. Cast metal restoration. Tissue management. Amalgam restoration. Impression materials and technique. Bioactive material. Non carious lesion. Management & endodontics treated teeth. Hypersensitivity. Dentin pulp complex. Periapical pathology. Microbiology of root canal. Root canal instruments. Biomechanical preparation. Obturation. Endodontics surgery. Intracanal medicaments. Pulpal diseases. Lasers in dentistry. Microscope. Success/failure/in endodontics. Hypersensitivity. Resorption. Pulp dentin complex.