CONSERVATIVE DENTISTRY

Objectives :
The following objectives are laid out to achieve the goals of the course. These are to be achieved by the time the candidate completes the course. These objectives may be considered under the following subtitles.

Knowledge
At the end of 36 months of training, the candidates should be able to:

- Describe aetiology, pathophysiology, periapical diagnosis and management of common restorative situations, endodontic situations that will include contemporary management of dental caries, management of trauma and pulpal pathoses including periodontal situations.
- Demonstrate understanding of basic sciences as relevant to conservative / restorative dentistry and Endodontics.
- Identify social, economic, environmental and emotional determinants in a given case or community and take them into account for planning and execution at individual and community level.
- Ability to master differential diagnosis and recognize conditions that may require multi disciplinary approach or a clinical situation outside the realm of the speciality, which he or she should be able to recognize and refer to appropriate specialist.
- Update himself by self-study and by attending basic and advanced courses, conferences, seminars and workshops in the speciality of Conservative Dentistry – Endodontics-Dental Materials and Restorative Dentistry.
- Ability to teach and guide. (Students and colleagues.)

Use information technology tools and carry out research both basic and clinical with the aim of his publishing his work and presenting the same at scientific platform

Skills

- Take proper chair side history, examine the patient and perform medical and dental diagnostic procedures, order, as well as perform relevant tests and interpret them to come to a reasonable diagnosis about the dental condition. To undertake complete patient monitoring including preoperative as well as post operative care of the patient.
- Perform all levels of restorative work and surgical and non-surgical Endodontics including endodontic end osseous implants, endodontic-periodontal surgical procedures as part of multidisciplinary approach to clinical condition.
- Provide basic life saving support in emergency situations.
- Manage acute pulpal and pulpo periodontal situations.
- Have a thorough knowledge of infection control measures in the dental clinical environment and laboratories

Human Values, Ethical Practice and Communication Abilities

- Adopt ethical principles in all aspects of restorative and contemporary Endodontics including non-surgical and surgical Endodontics.
- Should have Professional honesty and integrity.
- Dental care to be provided, regardless of social status, caste, creed or religion of the patient.
- Develop communication skills - in particular to explain various options available management and to obtain a true informed consent from the patient.
- Apply high moral and ethical standards while carrying on human or animal research
- He / She shall not carry out any heroic procedures and must know his limitations in performing all aspects of restorative dentistry including Endodontics. Ask for help from colleagues or seniors when required without hesitation.
- Respect patient's rights and privileges including patient's right to information.

Course contents (Syllabus) -
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 defence, bacterial virulence factors, healing, theory of focal infections, microbes or relevance to dentistry - strepto, staphylococci, lactobacilli, cornyebacterium, actinomycetes, clostridium, neisseria, vibrio, bacteriods, 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 micro-organisms 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 anaesthesia - agents and chemistry, pharmacological actions, fate and metabolism of anaesthetic, ideal properties, techniques and complications
- General anaesthesia - pre medications, neuro muscular blocking agents, induction agents, inhalation anaesthesia, and agents used assessment of anaesthetic problems in medically compromised patients.
- Anaesthetic emergencies
- Antihistamines, corticosteroids, chemotherapeutic and antibiotics, drug resistance, haemostasis, and haemostatic agents, anticoagulants, sympathomimitic drugs, vitamins and minerals (A, B, C, D, E, K

IRON), anti sialogogue, immunosupressants, 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 extract test, Sign test, Median test, Mann Whitney test, Krusical Wallis one way analysis, Friedmann 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. Advances in restorative materials
- 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

1. Examination, diagnosis and treatment plan
2. Occlusion as related to conservative dentistry, contact, contour, its significance. Separation of teeth, matrices, used in conservative dentistry.
3. Dental caries – epidemiology, recent concept of etiological factors, pathophysiology, Histopathology, diagnosis, caries activity tests, prevention of dental caries and management- recent methods.
4. Hand and rotary cutting Instruments, development of rotary equipment, speed ranges, hazards.
5. Dental burs and other modalities of tooth reparation - recent developments (air abrasions, lasers etc)
6. Infection control procedures in conservative dentistry, isolation equipments etc.
7. Concepts in tooth preparation for amalgam, composite, GIC, restorative techniques, material, its failures and management.
8. Direct and indirect composite restorations.
9. Indirect tooth colored restorations- ceramic, inlays and onlays, veneers, crowns, recent advances in

fabrication and materials and tissue management.

10. Impression procedures used for direct restorations
11. Cast metal restorations, indications, contraindications, tooth preparation for class II inlay, Onlay full crown restorations. Restorative techniques, direct and indirect methods of fabrication including materials used for fabrication like inlay wax, investment materials and
12. Direct gold restorations
13. Recent advances in restorative materials and procedures
14. Management of non-carious lesion.
15. Advance knowledge of minimal intervention dentistry.
16. Advances in restoration of endodontically treated teeth and grossly mutilated teeth
17. Hypersensitivity, theories, causes and management.
18. Lasers in Conservative Dentistry
19. CAD-CAM & CAD-CIM in restorative dentistry.
20. Dental imaging and its applications in restorative dentistry (clinical photography)
21. Principles of esthetics
    - Color
    - Facial analysis
    - Smile design
    - Principles of esthetic integration
    - Treatment planning in esthetic dentistry

Endodontics

1. Rationale of endodontics.
2. Knowledge of internal anatomy of permanent teeth, anatomy of root apex and its implications in endodontic treatment.
3. Dentin and pulp complex.
4. Pulp and periapical pathology
5. Pathobiology of periapex.
6. Diagnostic procedure - recent advances and various aids used for diagnosis, Orofacial dental pain emergencies: endodontic diagnosis and management
7. Case selection and treatment planning
8. Infection control procedures used in endodontics (aseptic techniques such as rubber dam, sterilization of instruments etc.)
9. Access cavity preparation - objectives and principles
10. Endodontic instruments and instrumentation -.recent developments, detailed description of hand rotary, sonic, ultra sonic etc.
11. Working length determination / cleaning and shaping of root canal system and recent development in techniques of canal preparation.
12. Root canal irrigants and intra canal medicaments used including non - surgical endodontics by calcium

hydroxide.

13. Endodontic microbiology.
14. Obturating materials, various obturation techniques and recent advances in obturation of root canal.
15. Traumatic injuries and management -endodontic treatment for young permanent teeth.
    Pediatric endodontics -treatment of immature apex.
16. Endodontic surgeries, recent developments in technique and devices, endoosseous endodontic implants -biology of bone and wound healing.
17. Endoperio interrelationship, endo + Perio lesion and management.
18. Drugs and chemicals used in endodontics.
19. Endo emergencies and management.
20. Restoration of endodontically treated teeth, recent advances.
21. Geriatric endodontics .
22. Endo emergencies and management.
23. Biologic response of pulp to various restorative materials and operative procedures.
24. Lasers in endodontics.
25. Multidisciplinary approach to endodontic situations.
26. Endodontic radiology- digital technology in endodontic practice.
27. Local anaesthesia in endodontics.
28. Procedural errors in endodontics and their management.
29. Endodontic failures and retreatment.
30. Resorptions and its management.
31. Microscopes in endodontics.
32. Single visit endodontics, current concepts and controversies.

Teaching / Learning Activities

The following is the minimum required to be completed before the candidate can be considered eligible to appear for final MDS exam.

First Year

Pre Clinical Work -Operative and Endodontics

Preclinical work on typhodont teeth

1. Class 2 amalgam cavities
    a. Conservative preparation
    b. Conventional preparation
2. Inlay cavity preparation on premolars and molars -MO, DO, MOD
    a. Wax pattern
    b. Casting
3. Onlay preparation on molars
    a. Casting
4. Full Crown

a. Anterior

b. Posterior

(2 each to be processed)

5. 7/8 crown

(1 to be processed)

6. 3/4 crown premolars

(1 to be processed)

Pre Clinical work on natural teeth

1. Inlay preparation on molars and premolars MO, DO, and MOD
   a. Wax pattern
   b. Casting
2. Amalgam cavity preparation and restoration (all types)
   a. Conventional
   b. Conservative
3. Pin retained amalgam on molar teeth
4. Post and core build up
   a. Anterior teeth
   b. Posterior teeth
5. Casting
6. Onlay on molars
   (1 to be processed)
7. Full crown premolars and molars
8. Full crown, anterior
9. Veneers, anterior teeth (indirect method)
10. Composite inlay (class 2)
    (1 to be processed)
11. Full tooth wax carving -all permanent teeth

Preclinical - Endodontics

1. Sectioning of all maxillary and mandibular teeth.
2. Sectioning of teeth -in relation to deciduous molar, 2nd primary upper and lower molar 1 each.
3. Access cavity opening and root canal therapy in relation to maxillary and mandibular permanent teeth.
4. Access cavity preparation and BMP
   Anterior
   a. Conventional prep
   b. Step back
   c. Crown down

Obturation

5. BMP Premolar — 04 (2 maxillary and 2 mandibular) and obturation 1 each of maxillary and mandibular premole.
6. BMP Molar — 06 cases (Maxillary & mandibular first molar – 2 cases and Maxillary & mandibular second molar – 1 case each) obturation of 1 case each of maxillary & mandibular first & second molar.
7. Post and core preparation and fabrication in relation to anterior and posterior teeth
   a. Anterior — 04 (casting 2)
   b. Posterior — 03 (casting 2)
8. Removable dies — 04 Nos.

Note: 1. Technique work to be completed in the first four months

2. Self-assessment and cross assessment should be applied.

Clinical work

A Composite restorations
B GIC Restorations
C Amalgam restorations (All types)
D Composite inlay + veneers (direct and indirect)
E Ceramic jacket crowns
F Post and core for anterior teeth
G Bleaching vital and non-vital teeth
H Anterior Teeth Root Cavel Treatment
I Endo surgery-observation and assistance

Presentation of

- Seminars - 34 seminars by each student -should include topics in Dental Materials, Conservative Dentistry and Endodontics.
- Journal club presentation
- Submission of synopsis of dissertation at the end of 10th month
- There will be internal assessment for theory & clinics.

Second Year

Clinical Work

1. Ceramic jacket crowns — 10
2. Post and core for anterior teeth — 10
3. Post and core for posterior teeth — 05
4. Composite restoration — 05
5. Full crown for posterior teeth — 15
6. Cast gold inlay — 05
7. Other special types of work such as splinting- Reattachment of fractured teeth etc. — 05

8. Anterior RCT 20
9. Posterior RCT 30
10. Endo surgery performed independently 05
11. Management of endo -Perio problems. 05
    - Under graduate teaching program as allotted by the HOD
    - Seminars - 3 by each student
    - Journal club presentation by each student
    - Dissertation work
    - Prepare scientific paper and present in conference and clinical meeting
    - Library assignment given in the first year of MDS to be submitted 18 months after starting of the course
    - Internal assessment -theory and clinical
12. Case Discussion – 3 cases.

Third Year

Dissertation work to be submitted 6 months before final examination.

Clinical work

- Cast gold inlay-Onlay, cuspal restoration 10
- Post and core 20
- Molar endodontics 50
- Endo surgery 05
- All other types of surgeries including crown lengthening, perioesthetics, hemi sectioning, splinting, replantation, endodontic implants.

Presentation of

- Seminars - 3
- Journal club presentation by each student
- Teaching programme as assigned by HOD.
- Internal assessment - theory and clinical.

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 be done by the staff of the department based on participation of students in various teaching *f* learning activities. It may be structured and assessment be done using check lists that assess various aspects. (Check lists are given in Section IV.)