

JODHPUR DENTAL COLLEGE GENERAL HOSPITAL

Department Of Conservative Dentistry & Endodontics

SYLLABUS (I YR M.D.S.)

Human Values, Ethical Practice and Communication Abilities

- Adopt ethical principles in all aspects of restorative and contemporary Endodontics including non-surgical and surgical Endodontics.
- Professional honesty and integrity should be the top priority.
- Dental care has 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:

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.

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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

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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, cornebacterium, 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,

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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, neuro muscular 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, 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

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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.

SYLLABUS (II YR M.D.S.)

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. Direct concepts in tooth preparation for amalgam, composite, GIC and restorative techniques, 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.
 - a. Tissue management
10. Impression procedures used for indirect restorations.

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11. 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.

12. Direct gold restorations.

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.

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Pediatric Endodontics – treatment of immature apex.

16. Local anesthesia in endodontics.

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SYLLABUS (FINAL YEARY MDS)

CONSERVATIVE DENTISTRY

1. Recent advances in restorative materials and procedures.
2. Management of non-cariou lesion.
3. Advance knowledge of minimal intervention dentistry.
4. Recent advances in restoration of endodontically treated teeth and grossly mutilated teeth
5. Hypersensitivity, theories, causes and management.
6. Lasers in Conservative Dentistry
7. CAD-CAM & CAD-CIM in restorative dentistry
8. Dental imaging and its applications in restorative dentistry (clinical photography)
9. Principles of esthetics
 - Color
 - Facial analysis
 - Smile design
 - Principles of esthetic integration
 - Treatment planning in esthetic dentistry

ENDODONTICS

1. Endodontic surgeries, recent developments in technique and devices, endosseous endodontic implants – biology of bone and wound healing.
2. Endo-perio interrelationship, endo- perio lesions and management
3. Drugs and chemicals used in Endodontics
4. Endo emergencies and management.
5. Restoration of endodontically treated teeth, recent advances.
6. Geriatric Endodontics

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7. Endo emergencies and management.
8. Biologic response of pulp to various restorative materials and operative procedures.
9. Lasers in Endodontics.
10. Multidisciplinary approach to endodontics situations.
11. Endodontics radiology- digital technology in endodontics practice.
12. Procedural errors in endodontics and their management.
13. Endodontics failures and retreatment.
14. Resorptions and its management.
15. Microscopes in endodontics.
16. 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.

Pre Clinical Work – Operative and Endodontics

Preclinical work on typhodont teeth

1. Class 2 amalgam cavities
 - a. Conservative preparation - 03
 - b. Conventional preparation - 03
2. Inlay cavity preparation on premolars
And molars – MO, DO, MOD - 10
 - a. Wax pattern - 06
 - b. Casing - 04
3. Onlay preparation on molars - 02
 - a. Casting - 01
4. Full Crown

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- a. Anterior - 05
- b. Posterior - 05
- (2 each to be processed)
- 5. 7/8 crown - 02
- (1 to be processed)
- 6. 3 / 4 crown premolars - 02
- (1 to be processed)

Pre Clinical work on natural teeth

- 1. Inlay on molars and premolars MO, DO, and MOD - 08
 - a. Casting - 02
 - b. Wax pattern - 02
- 2. Amalgam cavity preparation
 - a. Conventional - 02
 - b. Conservative - 02
- 3. Pin retained amalgam on molar teeth - 02
- 4. Post and core build up
 - a. Anterior teeth - 10
 - b. Posterior teeth - 05
- 5. Casting
 - a. Anterior - 04
 - b. Posterior - 02
- 6. Onlay on molars – 03 (1 to be processed)
- 7. Full crown premolars and molars - 04
- 8. Full crown anterior - 06
- (2 and 3 to be processed)
- 9. Veneers anterior teeth (indirect method) - 02
- 10. Composite inlay (class 2) – 03 (1 to be processed)

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11. Full tooth wax carving – all permanent teeth

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 downObturation 03
BMP Premolar 06 (2 upper and 2 lower) obturation 1 each
6. BMP Molar 06 (3 upper – 2 first molars and 1 second molar, 3 lower – 2 first molars and 1 second molar) obturation 1 each
7. Post and core preparation and fabrication in relation to anterior and posterior teeth
 - a. Anterior 10 (casting 4)
 - b. Posterior 05 (casting 2)
8. Removable dies 04

Note : Pre-clinical work to be completed in the first six months

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CLINICAL WORK:

I year

- A. Composite restorations 30
- B. GIC Restorations 30
- C. Complex amalgam restorations 05
- D. Composite inlay + veneers (direct and indirect) 05
- E. Ceramic jacket crowns 05
- F. Post and core for anterior teeth 05
- G. Bleaching- Vital 05
Non vital 05
- H. RCT Anterior 20
- I. Endo surgery – observation and assisting 05

Presentation of:

- Seminars – 5 seminars by each student – should include topics in dental materials, conservative dentistry and endodontics
 - Journal clubs – 5 by each student
 - Submission of synopsis at the end of 6 months
 - Library assignment work
- Internal assessment – theory and clinicals.
Case discussion- 5

II year

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

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7. Other special types of work such as splinting- Reattachment of fractured teeth
 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 – 5 by each student
 - Journal club – 5 by each student
 - Dissertation work
 - Prepare scientific paper and present in conference and clinical meeting
 - Library assignment to be submitted 18 months after starting of the course
 - Internal assessment – theory and clinical

III year

Clinical work

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

Presentation of:

- Seminars- 5 by each student
- Journal club- 5 by each student
- Teaching – lecture (under graduates)
- Internal assessment – theory and clinical

Dissertation work to be submitted 6 months before final examination.

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Conferences

- a. To attend 2 national specialty conferences and 2 convention during the course
- b. To present two poster and two paper at a national level conference
- c. To attend continuing dental education pertaining to the specialty

Submission

- a. Synopsis presentation – at the end of 6 months
- b. Preclinical work- end of six months from the commencement of the course
- c. Library dissertation- end of 18 months
- d. Dissertation-six months prior to main examination

Examination Pattern

Theory – 300 Marks

- a. Paper 1- applied basic sciences: Applied anatomy, hysiology, pathology including oral microbiology, Pharmacology, Biostatistics and research methodology and applied dental materials.
- b. Paper 2- Conservative Dentistry
- c. Paper 3- Endodontics
- d. Paper 4- Essay

Clinicals: 200 Marks

The duration of clinical and Viva voce examination will be 2 days for a batch of four students. If the number of candidates exceeds 4, the program can be extended to 3rd day.

Day I-

Cast core preparation- 50 marks

1. Tooth preparation – 10 marks
2. Direct wax pattern- 10 marks
3. Casting- 10 marks
4. Cementation- 10 marks
5. Retraction & Elastomeric impression- 10 marks

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Clinical exercise II- 50 marks

(Inlay exercise)

1. Tooth preparation for class II gold inlay – 25 marks
2. Fabrication of direct wax pattern- 25 marks

Day 2

Clinical Exercise III- 100 marks

(Molar Endodontics)

1. Local anaesthesia and rubber dam application- 20 marks
2. Access cavity preparation- 20 marks
3. Working length determination- 20 marks
4. Canal preparation- 20 marks
5. Master cone selection- 20 marks

Viva Voce: 100 Marks

1. 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.

2. 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.