

PEDODONTICS AND PREVENTIVE DENTISTRY

Goal

To train the graduates so that at the end of three years they should be able to understand and apply the knowledge of growth and development including psychological development of child. They should be competent to diagnose, treat and prevent dental diseases effectively and efficiently respecting the child's rights and privileges with professional honesty and integrity.

Objectives

a) Knowledge

Graduates should be able to

1. Obtain accurate clinical history, methodological examination of the child patient, perform essential diagnostic procedures and interpret them to arrive at a reasonable diagnosis and treat appropriately.
2. Understand the principles of prevention and preventive dentistry right from birth to adolescence.
3. Restore the lost tooth structure to maintain harmony between hard and soft tissues of the oral cavity.
4. Manage the disabled/ medically challenged children effectively and efficiently, tailored to the needs of individual requirement and conditions.
5. Develop an attitude to adopt ethical principles in all aspects of pedodontic practice..
6. Treatment care is to be delivered irrespective of the social status, cast, creed, and religion of the patients.
7. Willingness to adopt, after a critical assessment, new methods and techniques of child management developed from time to time, based on scientific research, which are in the best interest of the child patient.
8. Willingness to share the knowledge and clinical experience with professional colleagues.

b) Skills

1. To create not only good oral health in the children but also a good citizen.
2. To instill a positive attitude and behavior in children.
3. To guide and counsel the parents in regard to various treatment modalities including different facets of preventive dentistry.
4. To develop an attitude to seek opinion from allied medical and dental specialties, as and when required.

COURSE CONTENTS

FIRST YEAR

I. Applied Anatomy

1. Development of tooth
 - a. Eruption and shedding
 - b. Chronology
 - c. Teething disorders.
 - d. Differences between deciduous and permanent teeth.
 - e. Young permanent tooth.
 - f. Anomalies- Congenital and Developmental.
2. Macro and micro structure of enamel , dentine , cementum , pulp, periodontal ligament , and oral mucous membrane.
3. Growth and development of Face- maxilla, mandible and hard palate
4. Temporo – Mandibular Joint
5. Tongue –Development, histology, blood and Nerve supply.
6. General concepts, principles and theories of growth and development with applied approach
7. Blood vessels of facial region.
8. Muscles of orofacial region.
9. Muscles of mastication.
10. Lymphatic drainage of head and neck.
11. Cranial nerves associated with head and neck region.
12. Fascial spaces of head and neck.
13. Osteology of skull.

II. Applied Physiology

1. Saliva and salivary glands.
2. Deglutition and Swallowing.
3. Calcium metabolism.
4. Shock.

A. CVS

1. Cardiac cycle with special emphasis on cardiac problems with management.
2. Blood and its elements.
 - a. Blood dyscrasias with applied aspect.
 - b. Clotting factors and mechanism.
3. Homeostasis.

B. CNS

1. Pain pathway and management.
2. Body temperature regulations.
3. Taste pathway.

C. Respiratory System

- Chemical and neural regulations of respiratory cycle and applied aspect to Pedodontics.

D. Renal

- Anatomy and Physiology of glomerular apparatus and its applied aspect.

E. Endocrinology

- Functions and applied aspect.

III. Applied General Pathology and Microbiology

1. Inflammation
2. Healing and repair
3. Necrosis
4. Syncope.
5. Basic laboratory investigations with normal values.
6. Development of oral micro flora.
7. Microbiology of dental caries including microbes at specific locations.
8. Immunology
 - a. Basic immunology
 - b. Immunology of caries and periodontal diseases
 - c. Hypersensitivity reactions

IV. Pharmacology

1. Analgesics, anti inflammatory, antibiotics and supplements.
2. Drug abuse in dentistry.

V. Genetics : as related to

1. Dental caries
2. Periodontal diseases
3. Malocclusion
4. Congenital and developmental disturbances as applied to Pediatric dentistry.

VI. Diet and Nutrition

1. Carbohydrates, Proteins, Fats ,Vitamins and Trace elements
 - a. Role on general health
 - b. Function
 - c. Deficiency and Management
2. Balanced diet and counseling

VII. Biostatistics and Research Methodology

1. Statistical principles, Data Collection, Method of presentation, Method of summarizing.
2. Methods of analysis - Sampling and Sampling techniques, tests of significance. Experimental models, design and interpretation. Development of skills for preparing clear, concise and cogent scientific abstracts and publication.

Applied research methodology

1. Study designs, Animal and human interventional protocol, interpretation of methodologies applied to Pedodontics. Critical Scientific appraisal of literature.

Pedodontics including applied aspects

VIII. Aim, objectives, scope and future of Pediatric dentistry.

IX. Case History Recording, Outline of principles of examination, diagnosis and treatment planning including Radiology

X. Cariology

1. Historical background
2. Definition, Etiology and Pathogenesis
3. Caries pattern in primary, young permanent and permanent teeth in children.
4. Rampant caries, Early childhood caries and extensive caries. Definition, etiology, Pathogenesis, Clinical features, Complications and Management.
5. Diet and dental Caries
6. Diet recording, analysis, modifications and counseling.

XI. Dental Plaque: Definition, Initiation, Morphology, Metabolism, Biochemistry and Pathogenesis.

XII. Gingiva and Periodontium.

1. Normal Gingiva and Periodontium in children.
2. Differences between child and adult gingiva.
3. Gingival and Periodontal diseases - Etiology, Pathogenesis, Prevention and Management

XIII. Preventive Pedodontics:

1. Concepts, chair side preventive measures for dental diseases, high-risk caries including rampant and extensive caries - Recognition, Features and Preventive Management.
2. Fluorides- Topical and Systemic fluorides. Toxicity and its management.
3. Pit and Fissures Sealants.
4. Atraumatic Restorative Treatment (ART) and Minimal Invasive Dentistry (MID).
5. Oral Hygiene measures.
6. Correlation of brushing with dental caries and periodontal diseases.
7. Caries Activity tests, Caries prediction, Caries susceptibility and their clinical applications.
8. Caries Vaccine.

XIV. Dental Materials with recent advances

1. Amalgam.
2. Composite.
3. Glass ionomer and other cements.
4. Impression materials.
5. Stainless steel wires and bands.
6. Other materials used in the Pediatric dentistry.

SECOND YEAR

I. Pediatric Operative Dentistry

1. Principle of Operative Dentistry in primary and young permanent teeth along with modifications for materials.
2. Various Isolation Techniques
3. Restorations of decayed primary, young permanent and permanent teeth in children using various restorative materials like Glass Ionomer, Composites, Silver, Amalgam and latest materials.

II. Pediatric Endodontics.

1. Pulp and Pulpodentinal complex.
2. Differences in pulp of deciduous and permanent teeth.
3. Primary Dentition: - Diagnosis and management of pulpal diseases - Pulp capping, Pulpotomy, Pulpectomy (Materials and Methods), Controversies and changing concepts.
4. Young permanent teeth and permanent teeth, Pulp capping, Pulpotomy, Apexogenesis, Apexification, Concepts, Techniques and Materials used.
5. Endodontic Surgery
6. Stainless steel, Polycarbonate, Resin Crowns and Veneers.

III. Child Psychology with applied aspect

1. Developmental milestones
2. Psychological development from birth to adolescence.
3. Comparison of theories of psychological development.
4. Definition, Classification, Measurements / Scale, factors influencing and Management of
 - a. Fear
 - b. Anxiety
 - c. Apprehension
 - d. Emotion

IV. Behavior and its Management

1. Behavioral Development
2. Classification of Behavior
3. Factors influencing behavior
4. Management
 - a. Principles of Behavior Management
 - b. Non pharmacological management
 - c. Pharmacological management
 - ❖ Conscious sedation
 - ❖ General anesthesia

V. Comprehensive Infant oral health care

VI. Occlusion

1. Development from Birth to Adolescence with clinical and preventive aspect of each stage.
2. Recognition and management of normal and abnormal developmental occlusion in primary, mixed and permanent dentitions in children (Occlusal Guidance).

VII. Preventive and Community dentistry as related to Pedodontics

1. Prevention – levels of prevention.
2. Survey procedures including Planning and implementation.
3. Epidemiology
 - a. General principles.
 - b. Epidemiology of dental caries, periodontal diseases.
 - c. Changing trends in dental caries and periodontal diseases.
4. Indices for oral hygiene status, dental caries, gingival and periodontal diseases, fluorosis and malocclusion.
5. Dental health education.
6. School dental health programmes.
7. Dental auxiliaries.
8. Basic concepts of health – Iceberg phenomenon.

THIRD YEAR

I. Oral Habits in Children

1. Definition, etiology and classification.
2. Clinical features, management and prevention of deleterious oral habits.

II. Orthodontics

1. Preventive orthodontics
 - a. Malocclusion- classification, etiology, features, management and prevention.
 - b. Space management
 - ❖ Space analysis
 - ❖ Space maintainers
 - ❖ Space regainers
2. Interceptive orthodontics
 - a. Removable appliances: basic principles, contemporary appliances: design and fabrication.
 - b. Correction of cross bite, diastema etc.
 - c. Cephalometrics - tracing and analysis.
 - d. Serial extraction.
 - e. Habit interception.
 - f. Myofunctional appliances: Basic principles, contemporary appliances: Design and Fabrication.

III. Traumatic Injuries in Children

1. Prevalence, etiology, classifications and clinical features.
2. Reaction and sequelae of tooth to trauma- primary and permanent.
3. Management of traumatized hard and soft tissues.
4. Prevention and sports dentistry

IV. Dental care for Children with special needs

1. Definition, Etiology, Classifications, Clinical features and management of Physically, mentally and medically challenging conditions.
2. Genetic counseling

V. Child Abuse and Neglect.

VI. Oral manifestations of Systemic Conditions in Children and their Management.

VII. Bacterial , fungal and viral infections in children and their management.

VIII. Surgical procedures in Pedodontics.

IX. Medical emergencies and management in dental clinic.

X. Setting up of Pedodontic clinic.

This is basic minimum requirement, however a student needs to know all the related aspects of the above mentioned topics.

Preclinical Work

Should be submitted with brief description about each exercise during first 3 Months of First Year MDS

I. BASIC WIRE BENDING AND SOLDERING EXERCISE.

1. Straight line - "3 and 6"
2. Square - "1 and 1"
3. Rectangle - "3 and 1"
4. 5 u-v - $\frac{1}{2}$
5. Circle - 1 dia.

II. CLASPS

"C Clasps
Jackson Full
Triangle
Adams
Modified Distal extension.
 Eyelet
 Single arrow head
 Anterior Adams.

III. SPRINGS

"Z" Spring – Single and Double with Guard
Finger spring with Guard
Closed loop spring
Canine retractors. "U" loop
 Reverse loop
 Helical loop
 Buccal canine retractor
 Palatal canine retractor.

Coffins spring

IV. LABIAL BOW

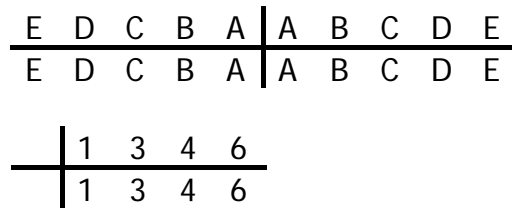
- Short
- Long
- Reverse
- Split

V. WAX CARVING

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| E | D | C | B | A | A | B | C | D | E |
| E | D | C | B | A | A | B | C | D | E |
| 7 | - | 1 | 1 | - | 7 | | | | |
| 7 | - | 1 | 1 | - | 7 | | | | |

VI. ENDODONTIC EXERCISES

Access cavity preparation and Root canal tracing on extracted tooth.



VII. RESTORATIVE EXERCISES

Class – I Cavity Prep.

| | | |
|---|---|---|
| D | E | 6 |
| D | E | 6 |

 on

Class – II on

| | | |
|---|---|---|
| D | E | 6 |
| D | E | 6 |

Conservative and Conventional

Class - I and II with palatal and Lingual

| | |
|---|---|
| E | 6 |
| E | 6 |

 extrn. on

MOD on

| | |
|---|---|
| E | 6 |
| E | 6 |

Inlay Prep.

| |
|---|
| 6 |
| 6 |

Tooth preparation for stainless steel crown and adaptation of S.S.Crown on

Full cast crown prep.

| | |
|---|---|
| D | E |
| D | E |

| |
|---|
| 6 |
| 6 |

Anterior Jacket Crown prep. and Fabrication of acrylic crown

Cuspal restorations/Pin amalgam restrn.

| |
|---|
| 6 |
| 6 |

Post and Core

VIII. FIXED APPLIANCE

1. Band adaptation on

| | | | | | |
|---|---|---|---|---|---|
| 1 | 3 | 4 | 6 | D | E |
| 1 | 3 | 4 | 6 | D | E |
2. Band adaptation for CI-II Anterior tooth fracture.
3. Space maintainers
 - a. Band and loop and with occlusal stop
 - b. Band and Bar
 - c. Crown and loop
 - d. Long span band and loop
 - e. Lingual arch with canine stopper.
 - f. Nance palatal arch
 - g. Trans palatal arch
 - h. Mayne's space maintainer
 - i. Distal shoe and modified distal shoe.
 - j. Gerber regainer.
 - k. Fixed habit breaking appliance with Cribs and Rakes
 - l. Fixed functional.
 - m. Bonded type of space maintainer.

X. STUDY MODELS.

1. Upper and lower Deciduous Dentition
2. Upper and lower Mixed Dentition - 1 2 C D E 6
3. Upper and lower Permanent Dentition

XI. FABRICATION OF SPECIAL TRAYS-

1. Primary dentition
2. Mixed dentition
3. Permanent dentition

XII. CEPHALOMETRIC TRACING and ANALYSIS

XIII. SPACE ANALYSIS FOR MIXED DENTITION

XIV. REMOVABLE APPLIANCES

1. Space maintainers
 - a. Removable unilateral functional
 - b. Removable unilateral non functional
 - c. Removable bilateral functional
 - d. Removable bilateral non functional
 - e. Dumbell (split – Saddle) space regainer
 - f. Sling shot space regainer
 - g. Helical coil space regainer
2. Appliances with "Z" spring.
3. Finger spring
4. Canine retractor
5. Bilateral symmetrical expansion screw appliance.
6. Anterior and posterior bite plane
7. Oral screen
8. Inclined plane

9. Hawley's retention appliance.
10. Removable Habit breaking appliance with Cribs, Rakes, Bead and Notch
11. Myofunctional appliance.
12. Lip bumper
13. Obturator / Feeding appliance.

Minimum Academic Requirements from 4months to 3 years

| No. | Work | Quota |
|-----|--|-------|
| 1 | Seminars | 15 |
| 2 | Journal clubs | 15 |
| 3 | Scientific poster presentation | 1 |
| 4 | Scientific paper presentations | Min 1 |
| 5 | Scientific paper to be ready for publication | 1 |
| 6 | Log book submission (one each year) | 3 |
| 7 | Display of academically oriented 'Case of the month' | 5 |
| 8 | Conducting theory class for UG students | 2 |

Clinical work Requirements from 4months to 3 years

The following is the minimum requirement to be completed before the candidate can be considered eligible to appear in the final M.D.S Examinations: -

| No | Clinical Work | Total | 4 To 12 Months | 13 To 24 Months | 25 To 36 Months |
|----|--|-------|-------------------|--------------------|--------------------|
| 1 | Behavior Management of different age groups children with complete records. | 17 | 2 | 10 | 5 |
| 2 | Detailed Case evaluation with complete records, treatment planning and presentation of cases with chair side and discussion | 17 | 2 | 10 | 5 |
| 3 | Step-by-step chair side preventive dentistry scheduled for high risk children with gingival and periodontal diseases and Dental Caries | 11 | 1 | 5 | 5 |
| 4 | Practical application of Preventive dentistry concepts in a class of 35-50 children and Health Education and Motivation. | 7 | 1 | 4 | 2 |
| 5 | Pediatric Operative Dentistry with application of recent concepts. (a) Management of Dental Caries | | | | |
| | (1) Class 1 | 50 | 30 | 10 | 10 |
| | (II) Class II | 100 | 40 | 50 | 10 |
| | (III) Other Restorations | 100 | 20 | 50 | 30 |
| | (b) Management of traumatized anterior teeth | 15 | 04 | 06 | 05 |
| | (c) Aesthetic Restorations | 25 | 05 | 10 | 10 |
| | (d) Pediatric Endodontic Procedures | | | | |
| | Deciduous teeth | | | | |
| | Pulpotomy /Pulpectomy | 150 | 30 | 50 | 70 |
| | Permanent Molars | 20 | 3 | 7 | 10 |
| | Permanent Incisor. | 15 | 2 | 3 | 10 |
| | Apexification and Apexogenesis | 20 | 02 | 08 | 10 |
| 6 | Stainless Steel Crowns | 50 | 10 | 20 | 20 |
| 7 | Other Crowns | 05 | 01 | 02 | 02 |
| 8 | Fixed Space Maintainers | 30 | 08 | 12 | 10 |

| | | | | | |
|-----------|--|----|----|----|----|
| 9 | Removable Space Maintainers | 25 | 05 | 10 | 10 |
| 10 | Preventive measures like fluoride applications and Pit and Fissure Sealants applications with complete follow-up and diet counseling | 20 | 08 | 08 | 04 |
| 11 | Special Assignments (i) School Dental Health survey program | 01 | | 01 | |
| | (ii) School Dental Health talk | 01 | 01 | | |
| | (iii) Camps and CDE programs | 02 | 01 | 01 | |
| 12 | Complete oral rehabilitation cases with all relevant records | 15 | | | |

(The figures given against Sl. No. 4 to 12 are the minimum number of recommended procedures to be performed)

Dissertations

a) Synopsis

1. Identifying and selection of topic.
2. Synopsis writing.
3. Presentation of synopsis to the department, institute review board and ethical committee.
4. Submission to university (End of first 6 months after commencement of post graduate programme).

b) Library Dissertation: Submission by 18 months after commencement of post graduate programme.

c) Main Dissertation submission 6 months before university examination.

Assessment and monitoring

1. Maintaining log books.

2. Scheme of exams (Institutional level).

- a. First Internal assessment on basic sciences at the end of first year (Theory and practical / clinical).
- b. Second internal assessment at the end of second year (Theory and practical / clinical).
- c. Preliminary examination in the last six months (Theory and practical / clinical and viva voce).

SCHEME OF UNIVERSITY EXAMINATION

A. THEORY : 300 MARKS

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 100. Paper I, II and III shall consist of two long questions carrying 20 marks each and 6 short essay questions carrying 10 marks. Paper IV will be on essay. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows:

Paper I: Applied basic sciences: applied anatomy, physiology, pathology, microbiology, nutrition and dietetics, growth and development and dental plaque.

Paper II: Clinical Pedodontics

Paper III: Preventive and community dentistry as applied to pediatric dentistry.

Paper IV: Essay

**The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.*

B. PRACTICAL EXAMINATION: 200 MARKS

The clinical / practical and viva-voce examinations are conducted for a minimum of two days.

First day:

1. Case history recording and pulpectomy on a primary molar.

Duration: 2hours

| | |
|------------------------|------------|
| Case discussion | : 20 marks |
| Rubber dam application | : 10marks |
| Working length X-ray | : 20 marks |
| Obturation | : 20 marks |
| Total | : 70 marks |

2. Case history recording and tooth preparation on a primary molar for stainless steel crown and cementation of the same.

Duration: 2hours

| | |
|---------------------------------|-----------|
| Case discussion | : 10marks |
| Tooth preparation | : 20marks |
| Crown selection and cementation | : 20marks |
| Total | : 50marks |

3. Case history recording and band adaptation for fixed type of space maintainer

Duration: 1hour 30 min

| | |
|-----------------|-----------|
| Case discussion | : 20marks |
| Band adaptation | : 20marks |
| Impression | : 20marks |
| Total | : 60marks |

Second day:

| | |
|---|------------|
| Evaluation of fixed space maintainer and cementation: | : 20 marks |
|---|------------|

C. Viva Voce : 100 MARKS

i. Viva-Voce examination: 80 marks

It includes all the components of course contents, chair-side viva, the presentation and discussion on dissertation.

ii. Pedagogy/Thesis presentation: 20 marks

A topic will 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.

(A+B+C = 600 MARKS)