

## STUDY GUIDE

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| <b>PROGRAM</b>              | <b>BDS</b>   |
| <b>COURSE TITLE</b>         | <b>Orthodontics</b>  |
| <b>ACADEMIC YEAR</b>        | <b>4<sup>th</sup> Year</b>   |
| <b>INTRODUCTION</b>         | Orthodontics is a course given to the fourth year dental students which provides knowledge of basics of growth and development, classification, diagnosis and management of different malocclusion in orthodontics. The course is divided into a theoretical part which includes lectures and practical sessions which provides the required knowledge and skills to perform basic analysis and diagnosis of malocclusions. The dental students will also learn fabrication of various removable appliances used for correction of malocclusions.  |
| <b>RATIONALE</b>            | This course will help students in management of patients presenting with mal-aligned and crooked teeth in clinical settings. This course will help them making treatment plan as per contemporary fixed and removable appliances used in orthodontics  |
| <b>OUTCOMES</b>             | By the end of this course, students will be able to manage basic orthodontic problems under direct supervision   |
| <b>DEPARTMENTS INVOLVED</b> | Orthodontics   |
| <b>COURSE OBJECTIVES</b>    | <p>By the end of the course, the students will be able to:</p> <p><u>INTRODUCTION TO ORTHODONTICS</u></p> <ul style="list-style-type: none"> <li>• Define the terminologies related to orthodontics.</li> <li>• Discuss the indications, contraindications and aims of various types of orthodontic treatments</li> </ul> <p><u>GROWTH AND DEVELOPMENT</u></p> <ul style="list-style-type: none"> <li>• Describe the variables affecting growth</li> <li>• Explain the prenatal and postnatal craniofacial growth</li> <li>• Describe the methods of studying growth</li> <li>• Discuss various theories of growth</li> <li>• Discuss the development of Temporomandibular joint.</li> </ul> |

### OCCLUSION

- Classify malocclusion.
- Explain the clinical features of normal occlusion
- Differentiate between occlusion and malocclusion
- Describe Andrews Six Keys of occlusion.

### DENTAL RADIOLOGY

- Describe the roentgen anatomy of teeth, jaws, and TMJ
- Describe variations in normal limits and abnormalities
- Discuss proper patient positioning while taking the cephalometric radiograph
- Explain radiation hazards
- Discuss the advantages and indications of CBCT (Cone Beam Computer Tomography)

### DEVELOPMENT OF DENTITION AND OCCLUSION

- Discuss the prenatal development of dentition
- Explain the features of primary, mixed and permanent dentition periods
- Describe Nolla's stages of tooth development
- Discuss the dimensional changes in dental arch that occur with growing age
- Discuss the variations in development including size, form, number and position of teeth
- Describe the various factors affecting development of occlusion.

### MALOCCLUSION AND ETIOLOGY OF MALOCCLUSION

- Classify malocclusion.
- Describe various local and hereditary environmental factors and habits that can cause malocclusion
- Discuss the following syndromes/conditions:
  - Treacher-Collins;
  - Pierre-Robin Syndrome;
  - Ectodermal Dysplasia;

- Down's Syndrome;
- Cleido-cranial Dysplasia;
- Hemifacial Microsomia;
- Achondroplasia.
- Crouzon and Apert Syndrome
- Fetal alcohol syndrome

#### PREVENTIVE AND INTERCEPTIVE ORTHODONTICS

- Discuss the management of habits leading to orthodontic problems
- Discuss space supervision, maintainers and space regainers
- Discuss protocol followed for serial extractions.

#### BONE METABOLISM

- Describe the normal structures of periodontal ligament and bone
- Explain the role of bone in eruption and stabilization
- Explain the favorable effects of orthodontic forces
- Discuss the factors affecting tooth movement.

#### BIOMECHANICS

- Discuss the functions of PDL
- Discuss the types of wires and alloys used in orthodontics
- Discuss the ideal properties of orthodontic wires
- Compare different types of alloys used in orthodontic brackets and wires.
- Discuss the skeletal and deleterious effects of orthodontic forces

#### ANCHORAGE, RETENTION, RELAPSE AND STABILITY

- Describe the various types of anchorage, retention and relapse
- Discuss occlusal stability and factors related to retention
- Discuss various strategies of management of patients during and after orthodontic treatment

#### REMOVABLE APPLIANCE

- Discuss the various types and indications of various intra- and extra-oral appliances for tooth movement.

#### GROWTH MODIFICATION

- Classify removable functional appliances.
- Describe class II and Class III functional appliances
- Discuss Concepts, indications, drawbacks, components and accessories of growth modification appliances.
- Discuss the biomechanics of fixed and removable growth modification appliances (Expanders, Facemask and chin cup)

#### FIXED APPLIANCES

- Discuss the background of different fixed appliances systems.
- Explain the indications, draw backs, components and accessories of fixed appliances.
- Describe various types of wires and brackets used in orthodontics.
- Describe various bonding and banding materials
- Discuss orthodontic emergencies and their management (use of wax, sliding of wire, poking wire).

#### TREATMENT PLANNING

- Discuss the following:
  - Non-skeletal problems including Class I malocclusion; Crowding, Spacing, Cross bite, Open bite, and Deep bite
  - Skeletal problems Class II Division 1 and Division 2
  - Class III
  - Extractions in Orthodontics
- Discuss the adjunctive treatment goals and principles for the management of malocclusion

#### SURGICAL ORTHODONTICS

- Describe the principles of orthognathic surgery;
- Discuss the surgical treatment options for Class II and Class III malocclusions
- Describe the indication and contraindications of orthognathic surgeries

#### CLEFT LIP AND PALATE

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|                        | <ul style="list-style-type: none"> <li>• Discuss the etiology, clinical features, general and orthodontic management of cleft lip and palate</li> <li>• Describe the referral pathways</li> </ul> <p><u>ADULT ORTHODONTICS AND PERIODONTAL CONSIDERATIONS</u></p> <ul style="list-style-type: none"> <li>• Discuss the etiology and clinical features of periodontal diseases.</li> <li>• Classify periodontal diseases.</li> <li>• Discuss the role of orthodontists in the management of periodontal diseases.</li> </ul>   |
| <b>CLINICAL SKILLS</b> | <p><u>DENTAL RADIOLOGY</u></p> <ul style="list-style-type: none"> <li>• Differentiate between various intra-oral and extra-oral radiographs</li> <li>• Interpret different radiographic films</li> </ul> <p><u>DIAGNOSTIC AIDS IN ORTHODONTICS</u></p> <ul style="list-style-type: none"> <li>• Obtain history of patients presenting to the OPD complaining of orthodontic problems following the recommended guidelines</li> <li>• Examine intra- and extra-orally patients presenting to the OPD complaining of orthodontic problems following the recommended guidelines</li> <li>• Trace cephalograms of at least 05 patients complaining of orthodontic problems following the recommended steps</li> <li>• Analyze the traced cephalograms of at least 05 patients complaining of orthodontic problems following the recommended steps; Cephalometric analysis, Sagittal analysis, Vertical analysis, Dental analysis, Soft tissue analysis</li> <li>• Perform cast, Bolton's and mixed dentition analysis of at least 03 patients complaining of orthodontic problems following the recommended steps</li> <li>• Develop a list of orthodontic problems following history, examination and analyses</li> <li>• Interpret cephalometric radiographs of at least 05 patients complaining of orthodontic problems</li> </ul> |

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|                            | <ul style="list-style-type: none"> <li>• Interpret OPGs of at least 05 patients complaining of orthodontic problems</li> <li>• Identify relevant anatomical structures and landmarks on OPG, Lateral cephalograms</li> <li>• Justify the type of radiographic investigation in a variety of patients presenting with orthodontic problems.</li> <li>• Justify the type of fixed appliance therapy and retention plan for at least 01 patient presenting with orthodontic problems</li> <li>• Document the correct treatment plan for patients presenting with orthodontic problems.</li> <li>• Refer patients presenting with orthodontic problems requiring complex treatment following the recommended guidelines.</li> </ul> <p><u>PROCEDURES</u></p> <ul style="list-style-type: none"> <li>• Fabricate at least 5 of each of the following: <ul style="list-style-type: none"> <li>- Adams clasp</li> <li>- Labial Bow</li> <li>- Canine retractor</li> <li>- Cantilever</li> <li>- Z spring</li> <li>- Hawley's Retainer</li> </ul> </li> <li>• Perform bracket and wire placement and elastomeric ligature on plaster models.</li> <li>• Identify orthodontic materials and instruments</li> <li>• Identify the different types of wires used in orthodontics</li> </ul> |
| <b>INTERNAL ASSESSMENT</b> | 10% ( Pre-professional Examination, Midterm Examination, Assignments and Class Presentations, Clinical Logbooks)  |
| <b>ANNUAL EXAMINATION</b>  | 90% ( MCQS, OSCE)   |
| <b>COURSE EVALUATION</b>   | This course will be evaluated as per JSMU & HEC policies  |