



**ALTAMASH INSTITUTE OF DENTAL MEDICINE
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**BDS Fourth Year
Operative Dentistry & Endodontics
Study Guide**

Introduction:

The course imparts theoretical and procedural knowledge, skills and behaviorism related to Operative Dentistry, Endodontic procedures and Paediatric Dentistry. Based on didactic and clinical components, the course is designed to focus on all basic and essential treatment plans and management of clinical conditions pertaining to Operative Dentistry and Endodontics that the dental graduate should be well trained for. The course will be covered in 36 weeks, with rotation of 09 weeks in the clinical divisions of Operative Dentistry, including Operative Dentistry, Endodontics and Paediatric Dentistry for each clinical group. The clinical rotations comprise of observing and performing designated number of clinical procedures and continuous formative assessment with feedback.

Rationale:

The course will help the students in holistically managing a patient presenting to the clinical settings once they graduate.

Outcome:

By the end of this course, students will be able to manage dental problems of patients related to Operative Dentistry, Endodontics and Pediatric Dentistry.

Teaching and learning:

- Flipped Classroom (FC)
- Interactive lectures (IL)
- Demonstrations (Demo)
- Tutorials
 - a. Cased Based Learning (CBL)
 - b. Small Group Discussion (SGD)

Assessment tools:

1. Multiple Choice Questions: (MCQs)
 - One Correct Type
 - One Best Type
2. Mini Clinical Examination (MiniCEX)
3. Observed Structured Clinical Examination (OSCE)



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s.n o.	Topic	Course Objectives: By the end of the course, 4th year students will be able to:	Teaching method	Assessment Tool
1.	<u>OPERATIVE DENTISTRY</u> Biologic Considerations In Operative Dentistry	<ul style="list-style-type: none"> • Discuss chemical composition, structure and properties of: <ul style="list-style-type: none"> - Enamel, - Dentin - Pulp - Cementum, - Gingiva. • Discuss the morphologic and histologic structure of tooth tissues with their clinical impact on restorations. • Discuss the importance of dentogingival complex and biologic width when planning restorations. 	IL	- MCQs
2.	Patient Evaluation and Problem Oriented Treatment Planning	<ul style="list-style-type: none"> • Define treatment-oriented treatment planning. • Discuss merits and drawbacks of treatment-oriented treatment planning and problem-oriented treatment planning. • Discuss the importance of a thorough medical and dental history. • Discuss elements of a clinical examination. 	I.L SGD	- MCQs



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		<ul style="list-style-type: none"> • Discuss esthetic parameters to be considered when restoring the dentition. • Discuss the importance of dental record keeping. • Discuss medical emergencies and their management. 		
3.	Preliminary Considerations In Operative Dentistry	<ul style="list-style-type: none"> • Justify the need for correct patient and operator positions when carrying out restorative procedures. • Discuss the importance of isolation in operative dentistry. • Describe different methods used for isolation. • Describe the armamentarium required for rubber dam isolation. • Describe application and removal of rubber dam for operative dentistry procedures. • Define cross infection. • Explain the exposure risks in dentistry. • Discuss different methods of cross infection control in dental office. • Enlist universal/ standard 	I.L	- MCQS



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		<p>precautions</p> <ul style="list-style-type: none">• Describe blood borne infections• Describe methods of hand hygiene• Discuss vaccination/ immunization of dental health care professionals• Discuss elements of personal protective equipment (PPE)• Discuss how to prevent needle stick injury• Discuss needle stick injury management• Discuss dental waste disposal• Discuss management of dental sharps• Differentiate among the following:<ul style="list-style-type: none">- Sterilization,- Disinfection,- Asepsis.• Discuss the importance of sterilization and disinfection.• List critical, semi critical and non-critical items• Discuss disinfection of dental unit waterlines• Discuss elements of a sterilization plan.		
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		<ul style="list-style-type: none"> • Describe various methods used for sterilization and methods to monitor effectiveness of sterilization. • List chemicals that are used for disinfection. • Define the terms: <ul style="list-style-type: none"> - Occlusion, - Static occlusion, - Dynamic occlusion, - Centric relation, - Maximum intercuspation, - Supporting cusps, - Non supporting cusps. • Explain types and directions of mandibular movements. • Explain the confirmative vs reorganized approach • Identify the high spot and do the adjustment • Discuss the importance of restoring occlusion in restorative dentistry. 		
4	Assessment of Radiographs	<ul style="list-style-type: none"> • Describe x-ray equipment, films and processing of x-rays. • Describe importance of radiographs in operative dentistry. • Discuss ADA guidelines for 	-I.L -SGD	- MCQs



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		<p>prescribing radiographs</p> <ul style="list-style-type: none"> • Identify normal anatomic structures of maxilla and mandible on the following radiographs: <ul style="list-style-type: none"> - Periapical, - Bitewing, - Occlusal, - Orthopantomogram (OPG). • Discuss indications and limitations of these radiographs' views for diagnostic purposes: <ul style="list-style-type: none"> - Periapical, - Bitewing, - Occlusal, - OPG. • List indications of CBCT in restorative dentistry and endodontics • Discuss biological effects and risks associated with radiations. 		
5	Dental Caries	<ul style="list-style-type: none"> • Define dental caries. • Classify caries according to the ADA classification, ICDAS I and II, GJ Mount (others include classifications based on site, severity, tissue involved, occurrence, caries 	I.L CBL	- MCQs



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		<p>activity etc.)</p> <ul style="list-style-type: none">• Discuss etiology and pathogenesis of dental caries.• Describe factors influencing dental caries process.• Discuss role of plaque biofilm in progression of dental caries.• Describe microorganisms responsible for dental caries.• Describe the Stephan's curve.• Describe clinical characteristics and progression of carious lesions as seen on:<ul style="list-style-type: none">- Pit and fissures,- Smooth surfaces,- Root surfaces.• Describe the progression of carious lesions in:<ul style="list-style-type: none">- Enamel,- Dentin.• Discuss the different zones of enamel and dentin caries.• Discuss methods of detection and diagnosis of dental caries.• Describe International Caries Detection and Assessment System (ICDAS II).• Discuss principles of		
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		<p>minimal invasive dentistry</p> <ul style="list-style-type: none">• Discuss how to assess dental caries risk for a patient.• Discuss Caries Management by Risk Assessment (CAMBRA).• Discuss caries management by the medical model• Discuss protocols and strategies for prevention of dental caries.• Discuss non-invasive options for treatment of existing lesions/ resin infiltration technique• Discuss caries control restorations and ART• Describe the clinical protocol for caries control restorations.• Justify the need of a logical treatment plan sequence for restoring a patient's dentition.• Define:<ul style="list-style-type: none">- Stepwise excavation,- Indirect pulp cap,- Direct pulp cap (cariou and iatrogenic).• Discuss various possible reactions of pulp-dentin complex to deep carious		
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		<p>lesion.</p> <ul style="list-style-type: none"> • Discuss the rationale of stepwise excavation. • List materials used for direct and indirect pulp cap. • Describe the clinical protocol for direct and indirect pulp cap procedures. • Perform indirect pulp cap restorations on permanent teeth. 		
6	Principles of Cavity Design And Preparation	<ul style="list-style-type: none"> • Describe the objectives of tooth preparation. • List factors that need to be considered before tooth preparation. • Describe the steps in the initial and final stages of tooth preparation. • Discuss shortcomings of Black's cavity classification 	I.L	- MCQS
7	Instruments and Equipment For Tooth Preparation	<ul style="list-style-type: none"> • List various cutting and non-cutting hand instruments. • Discuss the design features for hand cutting instruments. • Discuss the nomenclature for hand cutting instruments. • Describe sharpening of hand instruments. • Describe rotary cutting 	I.L	- MCQS



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		<p>equipment and instruments.</p> <ul style="list-style-type: none"> • Discuss common design characteristics of rotary cutting instruments (dental burs). • Discuss latest developments for tooth preparation and caries removal including: <ul style="list-style-type: none"> - Lasers, - Ozone, - Air abrasion. • Discuss hazards with cutting instruments & their prevention. 		
8	Direct Restorative Materials	<ul style="list-style-type: none"> • Discuss the composition, properties, merits and shortcomings of materials used for direct restorations: <ul style="list-style-type: none"> - Amalgam, - GIC, RMGIC - Composite 	FC	MCQs
9	Amalgam Restorations	<p>Class I</p> <ul style="list-style-type: none"> • Describe class I cavity preparation. • Discuss ways of improving resistance and retention form of a simple class I restoration. • Explain ways of improving resistance and retention form of complex class I 	I.L	- MCQS



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		<p>restorations.</p> <ul style="list-style-type: none">• Describe the need for cuspal coverage with special reference to rule of thirds.• Describe bonded amalgam restorations and mechanism of amalgam bonding.• Discuss cavity preparation of a class VI lesion.• Describe placement of amalgam in simple and complex class I cavities.• Describe other mechanical features to improve resistance and retention.• Discuss mercury hazards and hygiene <p>Class II</p> <ul style="list-style-type: none">• Explain the outline form of a class II cavity preparation.• Discuss ways of improving resistance and retention form of simple class II restorations.• Explain ways of improving resistance and retention form of complex class II restorations.• Describe the need for cuspal coverage with special reference to rule of thirds.		
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		<ul style="list-style-type: none"> • Describe for amalgam restorations: <ul style="list-style-type: none"> - Box only preparation, - Tunnel preparation, - Slot preparation. • Describe placement of amalgam in simple and complex class II cavities. • Describe types of dentin pins and their method of placement. • Describe other mechanical features to improve resistance and retention. • Discuss importance of matricing and wedging. • List various types of matrix band systems and wedges. • Describe the various parts of a tofflemire matrix band. 		
10	Bonding To Enamel And Dentine	<ul style="list-style-type: none"> • List advantages of adhesive techniques over non-adhesive methods. • Explain why enamel is a favorable substrate for bonding. • Differentiate structure of dentin from enamel. • Discuss the effect of smear layer on dentin bonding. 	I.L SGD	- MCQS



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		<ul style="list-style-type: none"> • Explain the effect of Configuration Factor (C-factor) on bonding. • Explain the effect of acid conditioning on enamel. • Discuss difficulties in dentine conditioning. • Discuss chemistry of primers and adhesive resin (bonding agent). • Explain the importance of hybridization for effective dentine bonding. • Describe 1st- 7th generation adhesives. • Explain steps involved in enamel and dentin bonding. • Describe the bond strength under optimal conditions. 		
11	Direct Composite Restorations	<ul style="list-style-type: none"> • Discuss esthetic considerations in diagnosis and treatment planning • Describe different esthetic parameters to be taken into account before planning a restoration • Discuss the chemistry of anterior composites. • Describe factors influencing shade selection. 	<ul style="list-style-type: none"> - I.L -FC - SGD 	- MCQS



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		<ul style="list-style-type: none">• Discuss guidelines for shade matching and various methods of shade selection.• Describe cavity preparation for class III restorations.• Outline cavity preparation for class IV restorations.• Discuss importance of matricing and wedging.• Outline composite placement technique for class III and IV restorations.• Discuss different instruments used for finishing and polishing of composite restorations and their use.• List indications, contraindications, advantages and disadvantages of direct composite veneers.• Describe clinical steps for placing direct resin composites veneer.• Explain the technique for diastema closure with direct composite• Describe indications, contraindications, advantages & disadvantages for composite resin as a posterior		
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		<p>restorative material.</p> <ul style="list-style-type: none">• List factors affecting retention of fissure sealants.• Describe placement technique for fissure sealants & preventive resin restorations.• Outline features of a class I and class II cavity for composite restoration.• Justify the need of pre-wedging in class II composite restorations.• Explain bonded base technique.• Describe for composite restorations:<ul style="list-style-type: none">• - Box only preparation,• - Tunnel preparation,• - Slot preparation.• Classify matrix systems available for composite restorations.• Compare circumferential and sectional matrix systems.• Justify different methods used to minimize polymerization shrinkage.• Discuss different methods to create a tight contact for class II composite restorations.		
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		<ul style="list-style-type: none"> • Describe various resin polymerization equipment. • Discuss cavity preparation and restoration of a class VI lesion. 		
12	Class V Restorations And Root Caries	<ul style="list-style-type: none"> • Describe cavity preparation for class V restorations. • Describe non-surgical and surgical techniques for isolating class V restorations. • Discuss restorative materials available for restoring class V lesions. • List ways of improving retention of class V composite restorations. • Define root caries. • Describe appearance and location of root caries. • List etiology and risk factors associated with root caries. • Discuss preventive and chemotherapeutic strategies to manage root caries. • Discuss available restorative materials for treating root caries. 	<ul style="list-style-type: none"> - I.L - FC - SGD 	- MCQS
13	Tooth Surface Loss	<ul style="list-style-type: none"> • Define the following types of tooth surface loss: <ul style="list-style-type: none"> - Abrasion, 	<ul style="list-style-type: none"> -I.L - FC --CBL 	- MCQS



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		<ul style="list-style-type: none"> - Attrition, - Erosion, - Abfraction. - Dentine hypersensitivity • Discuss the etiology, pathogenesis, prevention and management of tooth surface loss and dentine hypersensitivity. 		
14	Discoloration Of Teeth	<ul style="list-style-type: none"> • Describe causes of tooth discoloration. • Describe nature of stains. • Discuss mode of action of bleaching agent on stains. • Discuss complications of bleaching • List commonly used bleaching agents and their strengths. • Discuss indications and contraindications of various types of bleaching techniques. • Explain technique for: <ul style="list-style-type: none"> • In-office vital bleaching, • At-home vital bleaching, • Non-vital bleaching. • Describe the procedure for micro abrasion and macro abrasion. 	<ul style="list-style-type: none"> - I.L - FC -CBL 	- MCQS



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15	<p><u>ENDODONTI</u> <u>CS</u> Biological Considerations Of Dental Pulp And Periradicular Tissue</p>	<ul style="list-style-type: none"> • Describe anatomic regions of the pulp and their clinical importance. • Describe the functions of the pulp-dentin complex. • Describe blood vessels, lymphatics and neural components of pulp. • Discuss distribution and function of the neural components of pulp. • Discuss theories of dentin sensitivity. • Explain pathway of efferent nerves from pulp to central nervous system. • Discuss changes in pulp morphology with age. • Describe the structure and function of periradicular tissues. • Describe physiologic and structural characteristics of pulp and how it affects pulp response to injury. • Discuss iatrogenic effects on the dental pulp by: <ul style="list-style-type: none"> - Local anesthetics with vasoconstrictor, - Cavity/ crown preparation 	- I.L	- MCQS
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		<p>(thermal shock),</p> <ul style="list-style-type: none"> - Depth of cavity preparation, - Various restorative materials, - Placement of pins, - Polishing restorations, - Post-restoration hypersensitivity, - Orthodontic tooth movement, - Vital bleaching. <ul style="list-style-type: none"> • Discuss the formation and role of tertiary dentin in pulp protection. • Explain preventive measures adopted during dental restorative procedures to preserve pulp vitality. 		
16	Endodontic Microbiology	<ul style="list-style-type: none"> • Describe the routes of entry of microorganisms to the pulp and periradicular tissues. • Discuss the different types of endodontic infections. • Describe the various microbial species involved in various endodontic infections. • Explain ecology of endodontic microbiota and features of endodontic ecosystem. 	- I.L	- MCQS
17	Pulp And Periradicular	<ul style="list-style-type: none"> • Classify pulpal diseases. • Classify periradicular lesions 	- I.L - FC -CBL	- MCQS



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	Pathosis	<p>of pulpal origin.</p> <ul style="list-style-type: none"> • Describe etiological factors of pulp inflammation. • Explain mechanism of spread of inflammation in the pulp. • Explain why the pulp has difficulty in recovering from severe injury. • List specific and non-specific indicators of pulpal inflammation. • Describe the clinical and histological features of pulp diseases. • Explain the mechanism and consequences of spread of pulpal inflammation into periradicular tissues. • Describe clinical and histological features of periradicular lesions of pulpal origin. • Describe steps involved in repair of periapical pathosis. • Describe non-endodontic lesions that may simulate endodontic periradicular pathosis. 		
18	Endodontic Radiology	<ul style="list-style-type: none"> • Describe importance of radiographs in endodontics. 	-I.L - SGD	- MCQS



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		<ul style="list-style-type: none"> • Identify normal anatomic structures of maxilla and mandible on periapical radiographs. • Differentiate between endodontic and non-endodontic radiolucencies and radiopacities. • Describe radiographic characteristics of periapical lesion of endodontic origin. • Justify varying horizontal and vertical cone angulations to create image shift. • Describe the SLOB rule. • Describe new technologies for radiographic imaging. 		
19	Endodontic Diagnosis And Treatment Plan	<ul style="list-style-type: none"> • Discuss the importance of a thorough medical and dental history. • Discuss elements of a clinical examination. • Describe various vitality tests, their advantages and limitations. • Discuss the common medical diseases that may influence endodontic treatment planning. • Discuss special 	- I.L	- MCQS



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		<p>considerations when formulating treatment plans for geriatric patients.</p> <ul style="list-style-type: none"> • Discuss endodontic case difficulty assessment 		
20	Pulp Anatomy	<ul style="list-style-type: none"> • Correlate the shape of pulp system to root anatomy. • List laws of canal orifice location. • Outline pathologic factors that may cause alterations in pulp anatomy. • Describe major components of the pulp space and variations in the pulp system in apical third. • Determine radiographically the distance from occlusal/ incisal surface to the roof of chamber. • Describe accessory canals. • Discuss relationship of anatomic, radiographic and actual location of apical foramen. • Describe variations in pulp anatomy resulting due to: <ul style="list-style-type: none"> - Developmental defects, - With age. 	- IL	-MCQS
21	Instruments In	<ul style="list-style-type: none"> • List basic set of instruments 	- IL -	-MCQS



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	Endodontics	<p>appropriate for various endodontic procedures.</p> <ul style="list-style-type: none"> • Describe the general physical properties of instruments. • Describe the design of common canal preparation instruments and their proper use of to prevent breakage within canal. • Explain the basis for sizing and taper of hand operated instruments. • Describe techniques for sterilization and disinfection of endodontic instruments. • Describe nickel titanium rotary instruments. • Identify different types of endodontic instruments 		
22	Local Anesthesia In Endodontics	<ul style="list-style-type: none"> • Define pain threshold and the factors affecting it. • List techniques that are helpful in giving “painless” injections. • Describe the “routine” approach to conventional local anesthesia. • Describe circumstances that create difficulties in obtaining profound anesthesia. 	- IL	-MCQs



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		<ul style="list-style-type: none"> • Enlist indications and contraindications of local anesthesia • Enlist complications of local anestheisa • Justify use supplemental methods of obtaining pulpal anesthesia. • Discuss techniques of intraosseous, periodontal ligament, and intrapulpal injections. 		
23	Isolation, Endodontic Access And Length Determination	<ul style="list-style-type: none"> • Discuss methods of isolation in endodontics with emphasis on rubber dam isolation. • Describe importance of pre-operative assessment as pre-requisite for treatment success. • Discuss the importance of pre-endodontic buildup. • Describe the objectives, general principles, procedure, armamentarium and sequence of endodontic access cavity preparation. • Describe average length and canal configuration of various teeth. • Describe technique for 	- IL	-MCQs



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		<p>locating canal orifices.</p> <ul style="list-style-type: none"> • Identify errors during access cavity preparation • Explain how to correct errors during access cavity preparation • Describe various methods of working length determination. 		
24	Cleaning And Shaping	<ul style="list-style-type: none"> • Differentiate pulp space infection from infection in other tissues of body. • Discuss purpose of cleaning and shaping the pulp space. • Explain the concept of apical patency. • Describe various instruments movements. • Describe different techniques of canal preparation. • Explain how to minimize preparation errors in curved canal. • Discuss management of calcified canals. • Justify use of NiTi rotary instruments and its efficacy over SS files. • Explain the importance, properties and irrigation 	- IL	-MCQS



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		<p>techniques of irrigants.</p> <ul style="list-style-type: none"> • Name various agents used for irrigation. • Perform: <ul style="list-style-type: none"> - Pulpectomy of single rooted teeth (extracted teeth/patients), with conventional endodontic instruments - Cleaning and shaping of root canal (extracted teeth/patients). - Root canal irrigation (extracted teeth/patients). 		
25	Intracanal Medicaments And Temporary Filling Materials	<ul style="list-style-type: none"> • Name different microorganisms involved in endodontic pathosis. • Define intra canal medicament. • Discuss the properties, role, method of application and instruments used in intra-canal, inter-appointment medicaments. • Categorize various agents used as intra-canal medicament. • List temporary filling materials used in endodontics. • Describe techniques for placement and removal of 	- IL	-MCQS



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		temporary filling materials.		
26	Root Canal Obturation	<ul style="list-style-type: none"> • Describe the rationale of obturation. • Describe clinical criteria that determines time of obturation. • List properties of ideal core obturation material and sealer. • Name core obturation materials, sealers and obturation techniques. • Describe composition and properties of gutta percha. • Describe advantages and disadvantages of each core material. • Justify the need for using a sealer during obturation. • Describe lateral condensation technique. • Describe briefly other techniques used for obturation. • Discuss the radiographic criteria for evaluating quality of obturation. 	- IL	-MCQS
27	Procedural Accidents	<ul style="list-style-type: none"> • Describe causes, prevention and treatment of procedural accidents during: 	- I.L - FC -CBL	- MCQS



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		<ul style="list-style-type: none"> - Access cavity preparation, - Cleaning and shaping, - Obturation. • Describe the following errors including their management: <ul style="list-style-type: none"> - Transportation, - Ledging, - Elbow, - Zipping, - Root perforations- apical, middle and coronal, - Separated instruments, - Aspiration and ingestion, - Hypochlorite accident, - Air Emphysema • Discuss how procedural errors can affect the prognosis of treatment. 		
28	Endodontic Emergencies	<ul style="list-style-type: none"> • Identify causes of endodontic emergencies: pre-treatment, inter-appointment and post-obturation. • Discuss the difficulties in diagnosing and treating a patient presenting with an endodontic emergency. • Explain the importance of sequential approach to endodontic emergencies. • Describe how to manage 	<ul style="list-style-type: none"> - I.L - FC -CBL 	-MCQS



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		<p>various endodontic emergencies including:</p> <ul style="list-style-type: none"> - Painful irreversible pulpitis, - Necrotic pulp with symptomatic apical periodontitis, - Acute apical abscess, - Symptomatic apical periodontitis. <ul style="list-style-type: none"> • Identify inter-appointment and post-obturation flareup. • Discuss management of inter-appointment and post-obturation flareup. • Discuss pharmacological therapy used in emergency and its role in controlling pain and infection. • List indications and contraindications for prescribing analgesics, antibiotics, anti-inflammatory agents and anxiolytics. • Develop a treatment plan consisting of appropriate endodontic and pharmacologic strategies for managing pain, anxiety, and infection. 		
29	Restoration Of Endodontically	<ul style="list-style-type: none"> • Differentiate endodontically treated teeth from vital teeth. 	- I.L	-MCQS



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	Treated Tooth	<ul style="list-style-type: none"> • Explain the importance of coronal seal. • Discuss options available for restoring endodontically treated teeth. • Explain ferrule effect. • Describe indications of post placement in anterior and posterior teeth. • Describe Nayyar Core. • Describe ideal dimensions of a post. • Describe common post systems, their advantages and disadvantages. • Describe method of placement of prefabricated and cast post. • Describe core materials and their placement. • Discuss complications that can occur during placement of post. 		
30	Endodontic Retreatment	<ul style="list-style-type: none"> • Explain rationale and indications of endodontic retreatment. • Describe the alternates to endodontic retreatment. • Discuss technique of accessing through extra 	<ul style="list-style-type: none"> - I.L - FCR - Small Group Discussion (SGD) -CBL 	-MCQS



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		<p>coronal restorations.</p> <ul style="list-style-type: none">• Describe technique of removing crowns and posts.• Discuss various types of canal obstructions and their management.• Describe the techniques for gutta percha removal.• Explain the role of intra-canal medicament in retreatment.• Justify the need of endodontic surgery alone or in combination with nonsurgical root canal therapy.• Describe situations when endodontic surgery is contraindicated.• Define the terms:<ul style="list-style-type: none">- Incision for drainage,- Apical curettage,- Root-end resection,- Root-end preparation- Root-end filling,- Root amputation,- Hemisection,- Bicuspidization.• Discuss indications and the steps involved for the above mentioned procedures.• Explain principles of flap		
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		<p>design.</p> <ul style="list-style-type: none"> Describe in brief, step by step procedures involved in peri-radicular surgery. Discuss prognosis of endodontic surgical cases 		
31	Longitudinal Tooth Fractures	<ul style="list-style-type: none"> Differentiate among the following: <ul style="list-style-type: none"> Craze line, Cusp fracture, Cracked tooth, Split tooth, Vertical root fracture. Describe the causes of these fractures of tooth structure. Describe symptoms and clinical features of these fractures of tooth structure. Discuss the treatment, prognosis and prevention of a crack/ fracture at various levels. 	<ul style="list-style-type: none"> I.L FCR Small Group Discussion (SGD) CBL 	-MCQs
32	Endodontic And Periodontal Inter Relationship	<ul style="list-style-type: none"> Classify endodontic-periodontal lesions. Discuss possible paths of communication between pulpal and periodontal tissue. Differentiate between lesions of endodontic or periodontal origin based on clinical, 	<ul style="list-style-type: none"> I.L FC CBL 	-MCQs



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		<p>radiographic and histopathological features.</p> <ul style="list-style-type: none"> • Justify treatment options. 		
33	<p><u>PEDODONTI</u> <u>CS</u> Introduction To Pediatric Dentistry</p>	<ul style="list-style-type: none"> • Discuss growth and development of jaws and dentition. • Differentiate between permanent and primary teeth. • Discuss the chronology of development of primary and permanent Dentition. • Discuss eruption timing and sequence of primary and permanent teeth. 	-IL	-MCQs
34	<p>Pain And Anxiety Management Of Pediatric Patients</p>	<ul style="list-style-type: none"> • List various pharmacological methods of pain and anxiety control in pediatric patients. • Discuss different behavioral management strategies for pediatric patients. • Describe different sedation techniques for pediatric patients. • Discuss the dental management of children with special needs. 	-IL	-MCQs
35	<p>Prevention Of Dental Diseases And Pediatric Patients</p>	<ul style="list-style-type: none"> • Describe various medical conditions that may affect the management of pediatric patient. 	-IL	-MCQS



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	<ul style="list-style-type: none">• Discuss effects of diet on dental tissues.• Describe various sources of sugars.• Discuss the effect of fluoride on dental caries process.• Discuss mechanism of action of fluoride• Discuss management of accidental fluoride toxicity• Explain the rationale for fluoride supplementation.• Describe different vehicles of fluoride delivery.• Explain the importance of parental counseling• Describe the importance of dietary management and home care in caries prevention.• Discuss the importance of regular dental follow-ups.• Describe the importance of fissure sealing and acid etch technique as a preventive measure.• Describe the placement of pit and fissure sealants and preventive resin restorations in primary teeth.		
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36	Local Anesthesia Technique For Pediatric Patients	<ul style="list-style-type: none">• Describe available topical anesthesia solutions.• Describe new techniques for achieving topical anesthesia.• List various techniques of local anesthesia administration.• Describe supplemental anesthesia techniques• List contra indications of local anesthesia• Describe pain free anesthesia technique.• Discuss possible complications of local anesthesia.	-IL	-MCQS
37	Restorative Dentistry For Pediatric Dentition	<ul style="list-style-type: none">• Discuss methods to detect and diagnose dental caries in primary teeth.• Describe the pattern of early childhood caries and its management.• Discuss the radiographic views that are of value in diagnosing dental caries.• Explain the importance of isolation when restoring teeth.• Explain the importance of matrixing in proximal decay.	-IL	-MCQS



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		<ul style="list-style-type: none"> • Discuss restorative materials that can be used to restore a carious lesion. • Describe restoration of occlusal and proximal caries. • Describe the indications for stainless steel crowns and strip down crowns. • Describe the technique for stainless steel crown and strip down crown placement. 		
38	Pulp Therapy For Primary And Young Permanent Teeth	<ul style="list-style-type: none"> • Describe the development of a tooth from its eruption to root maturation. • Explain the need to save a primary tooth. • Describe the importance of case assessment. • Describe the indications and contraindications of pulp therapy in deciduous teeth. • Describe the stabilization of mouth in case of rampant caries. • Describe the indications, contraindications and procedures in primary dentition for: <ul style="list-style-type: none"> - Pulp cap, - Pulpotomy 	-IL -CBL	-MCQS



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		<ul style="list-style-type: none"> - Pulpectomy. • Describe indications, contraindications and procedure in young permanent dentition for: <ul style="list-style-type: none"> - Indirect pulp cap, - Direct pulp cap, - Cvek pulpotomy, - Apexogenesis, - Apexification. • Discuss the role of regenerative endodontics in the management of non-vital immature teeth. 		
39	Inherited Anomalies Of Enamel And Dentine	<ul style="list-style-type: none"> • List various inherited enamel and dentin defects. • Discuss the clinical problems associated and treatment objectives when managing inherited enamel and dentin defects. • Discuss the etiology, prevention, clinical features and management of: <ul style="list-style-type: none"> - Amelogenesis Imperfecta - Dentinogenesis Imperfecta - Molar Incisor hypomineralization. - Dentin dysplasia 	-IL -FC -CBL	-MCQS
40	Periodontal	<ul style="list-style-type: none"> • Classify periodontal diseases 	-IL -FC	-MCQS



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	Diseases In Pediatric Patient	<p>in children.</p> <ul style="list-style-type: none"> • Discuss the etiology, clinical features and management of acute gingival conditions: <ul style="list-style-type: none"> - Primary herpetic gingivostomatitis - Necrotizing ulcerative gingivitis. • Discuss the etiology, clinical features and management of chronic gingivitis and periodontitis. • Discuss etiology, clinical features and management of drug induced gingival enlargement. • Discuss periodontal disease as a manifestation of various syndromes and systemic diseases in children. 	-CBL	
41	Anomalies Of Tooth Formation And Eruption	<ul style="list-style-type: none"> • Discuss the prevalence, etiology and management of variation in number of teeth. • Discuss various anomalies in tooth size and their management. • Discuss various anomalies of tooth form and their management. • Describe disturbances in 	-IL -FC -CBL	-MCQS



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		eruption and exfoliation and its clinical significance.		
42	The Pedodontic Orthodontic Interface	<ul style="list-style-type: none"> • Discuss the importance of screening patients for orthodontic referral at the correct time. • Define interceptive orthodontics. • Discuss the rationale and sequence of serial extractions. • Discuss various space maintainers used in mixed dentition. • Describe various habit breaking appliances in pediatric patients. 	-IL	-MCQS
43	Oral Surgery And Pathology In Pediatric Patients	<ul style="list-style-type: none"> • Discuss lesions affecting the oral soft tissues in children: <ul style="list-style-type: none"> - Infections, - Ulcers, - Vesiculobullous, - White lesions, - Cysts, - Tumors. • Discuss lesions affecting the jaws in children: <ul style="list-style-type: none"> - Cysts, - Developmental, - Osteodystrophies, - Tumors. 	-IL -CBL	MCQS



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44	Dental Trauma	<ul style="list-style-type: none">• Classify dento-alveolar injuries.• Discuss the appropriate radiographs needed for an accurate diagnosis.• Describe different types of healings.• Describe the healing of pulp and factors affecting its healing.• Describe the healing of periodontium and factors affecting its healing.• Differentiate between various types of root resorptions:<ul style="list-style-type: none">- External resorption,- Cervical resorption,- Internal resorption,- Replacement resorption.• Describe management of hard tissue injury in primary dentition:<ul style="list-style-type: none">- Uncomplicated crown fracture,- Complicated crown fracture,- Crown-root fracture,- Root fracture.• Describe management of soft tissue injury in primary dentition:	-IL -FC -CBL	-MCQS
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	<ul style="list-style-type: none">- Concussion,- Subluxation,- Extrusive luxation,- Lateral luxation,- Intrusion,- Avulsion.• Describe the sequelae of injuries to primary dentition.• Describe management of hard tissue injury in permanent dentition:<ul style="list-style-type: none">- Enamel infarction,- Enamel fracture,- Enamel-dentin fracture,- Complicated crown fracture,- Uncomplicated crown-root fracture,- Complicated crown-root fracture,- Root fracture.• Discuss the types and uses of splints.• Describe the duration of splint therapy in each injury.• Describe the procedure for placement of composite and wire splint.• Describe management of soft tissue injury in permanent dentition:		
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		<ul style="list-style-type: none"> - Concussion, - Subluxation, - Extrusive luxation, - Lateral luxation, - Intrusion, - Avulsion. • Describe duration of splint therapy in each injury. • Describe the rationale of delayed reimplantation of an avulsed tooth. 		
45	Review Of Materials For Indirect Restorations	<ul style="list-style-type: none"> • Discuss the composition, properties, merits and shortcomings of materials used for indirect restorations: - Metals, - Ceramics 	-IL	-MCQS
46	Partial Coverage Indirect Restorations	<ul style="list-style-type: none"> • List: <ul style="list-style-type: none"> - Various partial and full coverage indirect restorations, - Materials available for fabrication of these restorations, - Materials that are used for cementation. • Describe the principles of tooth preparation for indirect restorations. • Describe indications and contraindications for: <ul style="list-style-type: none"> - Inlay, 	-IL	-MCQS



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		<ul style="list-style-type: none"> - Onlay. • Describe the clinical assessment and steps of preparation for: <ul style="list-style-type: none"> - Inlay, - Onlay. • Discuss soft tissue management and impression making for inlays and onlays. • Discuss laboratory steps for these restorations. • Describe the clinical procedure for cementation. • Discuss the latest innovations including CAD-CAM technology. 		
47	Porcelain Veneers	<ul style="list-style-type: none"> • Discuss indications and contraindications for veneers. • Describe the diagnostic procedures involved in treatment planning. • Justify the importance of quality and quantity of enamel for predictable bonding. • Describe tooth preparation, soft tissue management and impression making for veneers. • Describe methods of 	-IL	-MCQS



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		<p>temporization.</p> <ul style="list-style-type: none"> • Describe step by step procedure of veneer placement. • Explain the importance of silane coupling agent and hydro fluoric acid. • Describe techniques for intra oral repair of indirect restorations. 		
48	Full Coverage Indirect Restorations	<ul style="list-style-type: none"> • Describe the indications and contraindications for: <ul style="list-style-type: none"> - Porcelain jacket crown, - Porcelain fused to metal crown, - All metal crown, - All ceramic crown. • Discuss factors influencing shade selection. • Describe guidelines for accurate shade matching and various methods of shade selection. • Describe the clinical assessment required and the steps of preparation for: <ul style="list-style-type: none"> - Porcelain jacket crown, - Porcelain fused to metal crown, - All metal crown, 	-IL	-MCQS



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		<ul style="list-style-type: none">- All ceramic crown.• List materials available for these restorations and the cements used for cementation.• Discuss soft tissue management and impression making for full coverage restorations.• Discuss the indications, contra indications and technique for the use of electro-surgery.• Discuss laboratory steps for these restorations.• Describe the clinical procedure for cementation.• Discuss the latest innovations including CAD-CAM technology.		
49	Implant Supported Restorations	<ul style="list-style-type: none">• Discuss indications and contraindications of implant supported restorations.• Describe various implant supported restorations that can be used for replacement of missing teeth	-IL	-MCQs



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CLINICAL SKILLS			Teaching Methods	Assessment tools
By the end of the session students will be able to:				
1	Patient Evaluation And Problem Oriented Treatment Planning	<ul style="list-style-type: none"> • Perform extra oral and intraoral examination of patients presenting to the dental clinic. • Formulate a logical treatment plan. • Take informed consent from patient presenting to dental OPD • Take medical and dental history of a patient presenting to dental clinic. 	-Demo	-OSCE Mini CEX
2	Preliminary Considerations In Operative Dentistry	<ul style="list-style-type: none"> • Demonstrate the ideal operating positions when carrying out various procedures. • Perform application and removal of rubber dam on patients when carrying out a restorative procedure. 	-Demo	-OSCE
3	Assessment Of Radiographs	<ul style="list-style-type: none"> • Interpret pathological findings seen on radiographs. • Diagnose dental caries based on clinical and radiographic examination. • Assess dental caries risk for a patient. 	-Demo	-OSCE



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4	Dental Caries	<ul style="list-style-type: none"> • Counsel patients regarding measures to prevent dental disease. • Make a maintenance care and recall visit interval plan for patients based on risk assessment. 	-Demo	-OSCE
5	Instruments And Equipment For Tooth Preparation	<ul style="list-style-type: none"> • Demonstrate various instrument grasp techniques that can be employed. • Perform placement of tofflemire band and wedge on patients when restoring multi-surface cavities. 	-Demo	-OSCE
6	Restorations	<p>AMALGAM RESTORATIONS</p> <ul style="list-style-type: none"> • Perform Class I, II & III cavity preparation and amalgam restorations on patients. • Demonstrate mercury waste handling and disposal <p>COMPOSITE RESTORATIONS</p> <ul style="list-style-type: none"> • Perform preoperative evaluation before placing an anterior composite restoration. • Prepare Class III and IV cavity for composite 	-Demo	-OSCE



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		<p>placement.</p> <ul style="list-style-type: none">• Perform finishing and polishing of composite restorations.• Perform preoperative evaluation for a posterior composite restoration.• Perform placement of appropriate matrix and wedges on patients when restoring teeth with composite.• Place pit and fissure sealants and preventive resin restorations,• Prepare Class I, II and VI cavity preparation for composite restorations. <p>ROOT CARIES AND CLASS V RESTORATIONS</p> <ul style="list-style-type: none">• Diagnose root caries based on clinical and radiographic findings.• Perform on patients:• Class V cavity preparation and restore with appropriate material.• Cavity preparation and restoration of root caries with appropriate material.		
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		<p>FULL COVERAGE RESTORATIONS</p> <ul style="list-style-type: none"> • Prepare anterior and posterior teeth (on phantom head/extracted) for full-coverage Porcelain-fused to metal crown and all ceramic crowns 		
7	Local Anesthesia And Isolation	<ul style="list-style-type: none"> • Perform administration of topical and local (infiltration and block) anesthesia before starting root canal treatment on patients. • Perform rubber dam isolation before starting endodontic treatment. 	-Demo	-OSCE
8	Endodontics	<ul style="list-style-type: none"> • Take an informed consent before any endodontic treatment. • Identify visible changes in instruments that will predispose them to breakage • Correlate radiographic findings to the history and clinical examination of patients for endodontic treatment • Take medical and dental history of patient presenting to dental clinic • Perform extra oral and intraoral examination on patients to ascertain pulpal and periapical 	-Demo	-OSCE -Mini CEX



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		<p>health.</p> <ul style="list-style-type: none">• Perform vitality tests on patients.• Interpret findings of various vitality tests in clinical settings.• Diagnose pulpal and periapical pathosis in patients based on history, clinical and radiographic examination.• Formulate a treatment plan.• Identify the internal and external anatomy of teeth in sagittal and cross section on clinical pictures.• Prepare access cavity on single rooted teeth (extracted teeth/patients).• Determine working length of single rooted teeth (extracted teeth/patients).• Draw outline of access cavity of each tooth.• Demonstrate placement of intracanal medicament in root canal• Identify on clinical and/or radiographic slides various procedural errors.• Perform obturation of single rooted teeth (extracted		
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		<p>teeth/patients) with cold lateral condensation method</p> <ul style="list-style-type: none"> • Write down a prescription for pain and infection control in patients presenting with endodontic pain. • Illustrate various flap designs for endodontic surgeries. 		
9	Dental Anomalies	<ul style="list-style-type: none"> • Diagnose anomalies of tooth size and form based on clinical and radiographic findings. • Diagnose disturbances in eruption and exfoliation based on history, clinical and radiographic findings. • Diagnose (paper based cases only/ not on patients) on history, clinical and radiographic findings: <ul style="list-style-type: none"> - Amelogenesis Imperfecta - Dentinogenesis Imperfecta - Molar Incisor hypomineralization 	-Dem	-OSCE
10	Dental Trauma	<ul style="list-style-type: none"> • Take medical and dental history of a patient presenting with history of dental trauma. • Perform thorough extraoral and intraoral examination of patient presenting with history of dental trauma. 	-Demo	-OSCE



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		<ul style="list-style-type: none">• Diagnose longitudinal tooth fractures in patients based on history, clinical and radiographic examination.		
11	Pedodontics	<ul style="list-style-type: none">• Demonstrate various behavioral management strategies on simulated pediatric patients.• Write down a prescription for pain and infection control in pediatric patients presenting with endodontic pain.• Take a medical and dental history of a pediatric patient.• Counsel parent/ guardian of a pediatric patient regarding measures to prevent dental disease.• Demonstrate correct tooth brushing technique.• Perform placement of pit and fissure sealants on pedodontic patients• Perform preventive resin restorations on patients presenting to dental OPD• Perform painless anesthesia technique on pediatric patients undergoing restorative treatment.• Diagnose dental caries in	-Demo	-OSCE



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		primary teeth based on clinical and radiographic examination. <ul style="list-style-type: none">• Perform restoration of primary teeth.• Perform indirect pulp cap procedure on primary and young permanent teeth.• Formulate a referral letter to an orthodontist when required		
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Reading Sources:

Text Books:

- Sturdevent's Art and science of Operative Dentistry. Latest edition
- Summit's fundamentals of Operative Dentistry. (Latest edition)
- Pickard Manual Of Operative Dentistry 9th Edition by Avijit Banerjee
- Cohens Pathways of the pulp Latest Edition
- Torabinejad Endodontic principles and practice (Latest edition)
- Welbury's Paediatric Dentistry Latest Edition
- Eric Whaites Essentials of Dental Radiology Latest edition
- Carl E Misch Dental Implant prosthetics Latest edition

Internet resources: With easy excess to digital library students will use internet resources with added time flexibility to enrich and update their knowledge and its application.

Library: It provides wealth of resources, space to study alone or in a group. It also provide world of books to discover and borrow.

Assessment Criteria :

Knowledge: MCQs (Multiple Choice Questions) are used to asses objectives covered in each module.

- A MCQ has a statement or clinical scenario followed by four options (likely answer).
- Students after reading the statement/scenario select ONE, the most appropriate response from the given list of options.



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- Correct answer carries one mark, and incorrect 'zero mark'. There is no negative marking.
- Students mark their responses on an answer sheet provided by examination department.

Skills:

- OSCE: Objective Structured Clinical Examination:
- Each student will be assessed on the same content and have same time to complete the task.
- Comprise of 12-25 stations.
- Each station may assess a practical tasks include practical skills and application of knowledge
- Stations are observed, interactive, application of knowledge based and rest.
- In Observed and Interactive Stations these will be assessed by internal or external examiners through structured viva or a task.
- Application of knowledge Stations: it will be static stations in which there will be pictures, clinical scenarios with related questions for students to answer on the provided answer copy.
- Rests: It is a station where there is no task given and in this time student can organize his/her thoughts.

AIDM Internal Assessment Policy

Students will be assessed to determine achievement of learning objectives through the following:

- Midterm Examination will be scheduled on completion of half of the course and OPD rotations
- Mock Examination will be scheduled on completion of whole course and OPD rotations
- The method of examination comprises theory exam which includes MCQs, and practical examination by OSCE (Objective Structured Clinical Examination).
- Student's behaviors and attitudes will be observed during all academic activities.



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Annual Examination:

- Marks of both internal assessments will constitute 20% weightage as per JSMU policy.
- University Annual examination carries 90% marks. Theory exam will be based on MCQs and Clinical / Professional /communication skills will be assessed by OSCE.

Attempts: There are 2 attempts in the fourth professional examination only. 2nd attempt is the supplementary examination which if not passed student has to repeat the year.

Course Evaluation:

- Pass/fail ratio of continuous and summative assessments will be evaluated.
- 75% attendance is mandatory to be eligible for annual professional examination
- Feedback will be taken
 - Regarding course from students and faculty
 - Student feedback regarding faculty
 - Faculty feedback of students

Teaching Faculty:

Prof. Dr. Zahid Iqbal

Professor, Head of Department

Dr. Saqib Hameed

Assistant Professor

Dr. Afifa

Sr. Lecturer

Dr. Maha

Demonstrator

Dr. Zainab

Demonstrator



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