Logbook for Junior Operative Dentistry and Endodontics

Year 03 BDS

STANDARD OPERATING PROCEDURES (SOPS) FOR JUNIOR OPERATIVE AND ENDODONTICS

This logbook is designed for 3rd year BDS Students to document their progress in learning and practice of basic Operative Dentistry Procedures. It aligns with the objectives of the modular system to enhance preclinical skills and prepare students for clinical practice. The curriculum for junior operative dentistry is divided into two modules for effective learning and skill development.

OBJECTIVES

- **Develop manual dexterity and understanding of basic operative procedures.**
- **Familiarize students with dental instruments, materials, and techniques.**
- **Provide hands-on cavity preparation, restoration, and finishing practice in a preclinical environment.**
- **Instill principles of basic Endodontics procedure**

PRE-CLINICAL REQUIREMENTS

UNIFORM AND PERSONAL PROTECTIVE EQUIPMENT (PPE):

- **White Clean lab coat.**
- **Protective eyewear or face shield.**
- **Disposable gloves and masks.**
- **Shoes (sleepers not allowed).**

MATERIALS AND INSTRUMENTS:

Students must carry the following for all sessions:

- **Basic instruments: Mouth mirror, probe, tweezers, and instrument tray.**
- **Restorative instruments: Excavators, amalgam carriers, plugger, carvers, and Burnisher.**
- **Rotary instruments: High-speed hand piece with appropriate burs.**
- **Materials: Amalgam, composite, glass ionomer cement, and cavity liners.**
- **Typhodont with mounted teeth.**

GENERAL GUIDELINES

ATTENDANCE:

- **75% Mandatory for all pre-clinical sessions.**

PREPARATION:

- **Review theoretical knowledge relevant to the procedure before the session.**
- **Assemble all required instruments and materials before starting.**

INFECTION CONTROL:

- **Practice standard infection control protocols.**
- **Dispose of waste materials in designated bins.**

GENERAL INSTRUCTIONS FOR LOGBOOK USE:

- **Students must record all activities in the logbook on the same day they are performed.**
- **Supervisors must verify each task with their signature and provide feedback where necessary.**
- **The logbook should be submitted for review at the end of the module.**
- **The completion of tasks in this logbook is mandatory for module completion.**

INSTRUCTIONS FOR WORKING POSITIONS:

During the operative procedure, each student will be examined for whether

- **He/she sits with the spine in an upright position, with the back well supported, the feet firmly placed on the ground, the thighs parallel to the floor, and the shoulders relaxed.**
- **While working on the lower jaw, the phantom head's occlusal plane is at 45 degrees to the floor.**
- **While working on the upper jaw, the student's neck should not be unnecessarily bent.**
- **The student should hold the dental mirror in a non-working hand and reflect the light.**

CONTENTS

Objectives:

- Develop basic psychomotor skill for anterior composite restoration and introduction to endodontic procedures
- Identify and apply correct instrumentation according to the procedures
- Demonstrate correct infection protocol and safety protocol
- Apply retraction chord in deep anterior restoration
- Interpret basic dental radiograph relevant to diagnosis and treatment planning
- Document clinical tasks, self-reflection and faculty feedback systematically

Anterior composite restoration

Learning objectives:

- Identify indication and tooth preparation principles for class 3 restoration
- Apply cellulose strip/plastic strip and wedge placement
- Demonstrate adhesive bonding protocol (etch, bond and cure)
- Place incremental pattern composite restoration
- Demonstrate contour, finish and polish composite to restore esthetic and contour
- State indication and purpose of retraction cord
- Demonstrate selection and placement technique of retraction cord

Periapical and bitewing radiograph

Learning objectives:

- Understand indication of PA x-ray and demonstrate parallel technique of PA x-ray
- Recognize normal anatomical landmark in periapical x-ray and label it.
- Identify periapical lesion and explain the radiolucency on PA x-ray
- Determine working length on PA x-ray
- Indication of bitewing x-ray

- Identify proximal caries and crestal bone level
- Identify enamel caries and dentine caries on bitewing x-ray

Endodontic instruments

Learning objectives:

- Classify endodontic instruments according to use
- Identify common hand files, GGs bur, paper point, spreader and plugger
- Demonstrate correct handling and instrument sequence for step back canal preparation

Endodontic procedure

Learning objectives:

- Identify access outline forms for maxillary central incisor and perform access cavity
- Demonstrate straight-line access to pulp chamber and canals
- Understand the concept of apical constriction and importance of working length.
- Demonstrate radiographic working length determination.
- Record working length accurately for central incisor
- Demonstrate Step-Back technique with proper file sequence
- Understand the purpose of obturation & apical seal.
- Perform zinc oxide euginol based sealer application
- Demonstrate cold lateral obturation using master cone & accessory cones
- List common temporary restorative materials.
- Demonstrate placement & sealing of temporary restorations after RCT access.

Class 3 composite restoration in right maxillary central incisor

Task	Steps to be followed	Action taken (Y/N)	Supervisor comment
Isolation	Rubber dam placement from canine to canine		Competency scale 0= not performed 1=Beginner (need full assistant) Major errors, multiple correction 2. Competent (independent with minor error 3. Proficient (Independent and accurate
Shade selection	Before the procedure	Shade:	
Cavity preparation	• Lingual approach preferable • Facial approach if defect involve facial surface • Obtaining access to the defect (caries lesion) Removing faulty structures (carious tissue, defective dentin and enamel, defective restoration, base material) • Enamel bevel is used on the facial cavo surface margin • Creating the convenience form for the restoration		
Contact and contour	Matrix /cellulose strip and wedge placement		
Adhesive bonding protocol	• 37% phosphoric acid for 30 sec • Rinse and dry for 5 sec • Rewet the surface with damp cotton • Apply bonding agent • Cure for 20 sec		
Placement technique	Increments of 2mm		
Curing of composite	Cure each increment separately for 20 sec		
Finishing and polishing	Contouring Finishing polishing		

STUDENT REFLECTION

Reflection	Response
What I did today	
What went well	
What I found difficult	
What I need to improve next time	

Student competency scale: supervisor signature:

Class 3 composite restoration in right maxillary lateral incisor

Task	Steps to be followed	Action taken (Y/N)	Supervisor comment
Isolation	Rubber dam placement from canine to canine		Competency scale 0= not performed 1=Beginner (need full assistant) Major errors, multiple correction 2. Competent (independent with minor error 3. Proficient (Independent and accurate
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Class 3 composite restoration in right maxillary canine

Task	Steps to be followed	Action taken (Y/N)	Supervisor comment
Isolation	Rubber dam placement from canine to canine		Competency scale 0= not performed 1=Beginner (need full assistant) Major errors, multiple correction 2. Competent (independent with minor error 3. Proficient (Independent and accurate
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Class 3 composite restoration in left maxillary central incisor

Task	Steps to be followed	Action taken (Y/N)	Supervisor comment
Isolation	Rubber dam placement from canine to canine		Competency scale 0= not performed 1=Beginner (need full assistant) Major errors, multiple correction 2. Competent (independent with minor error 3. Proficient (Independent and accurate
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Class 3 composite restoration in left maxillary lateral incisor

Task	Steps to be followed	Action taken (Y/N)	Supervisor comment
Isolation	Rubber dam placement from canine to canine		Competency scale 0= not performed 1=Beginner (need full assistant) Major errors, multiple correction 2. Competent (independent with minor error 3. Proficient (Independent and accurate
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Class 3 composite restoration in left maxillary lateral canine

Task	Steps to be followed	Action taken (Y/N)	Supervisor comment
Isolation	Rubber dam placement from canine to canine		Competency scale 0= not performed 1=Beginner (need full assistant) Major errors, multiple correction 2. Competent (independent with minor error 3. Proficient (Independent and accurate
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Student competency scale: supervisor signature:

Retraction cord placement

- Required instrument and material
- Retractor cord size (0, 1, 2)
- Hemostatic agent (optional)
- Cord packer (serrated/ non- serrated)
- Cotton roll
- Tweezers
- Air-water syringe
- Teeth model with gingival simulation

Task	Action	Assessment criteria
Cord selection • Single cord technique	Which number to be selected	• Circumferential placement • Cord position below the free gingival margin • Good visibility of margin
Field preparation • Moisture control • Bleeding control		
Measurement of cord		
Cord placement		
Cord removal		

Student reflection

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Competency assessment scale: competent

Non-competent supervisor signature:

Activity 1

Take periapical x-ray of normal maxillary anterior teeth and label the normal anatomical structure visible on x-ray

Activity 2

Take periapical x-ray of normal maxillary premolar teeth and label the normal anatomical structure visible on x-ray

Activity 3

Take periapical x-ray of normal maxillary molar teeth and label the normal anatomical structure visible on x-ray

Activity 4

Take periapical x-ray of normal mandibular anterior teeth and label the normal anatomical structure visible on x-ray

Activity 5

Take periapical x-ray of normal maxillary premolar teeth and label the normal anatomical structure visible on x-ray

Activity 6

Take periapical x-ray of normal mandibular molar teeth and label the normal anatomical structure visible on x-ray

Activity 7

Label and interpret PA x-ray with apical pathology

Student reflection

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What I did today	
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Activity 8

Take posterior bitewing x-ray and label all the normal visible structure on bitewing x-ray

Activity 9

Take bitewing x-ray of high caries risk patient and label all the caries lesion

Student reflection

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Endodontic instruments identification

Instrument according to use	Instrument list	Use	Action (observed/identified
Diagnostic instrument	Mouth mirror DG-16 Endo ruler		
Access opening	Endodontic z burs Gats glidden drills		
Canal negotiation	Barbed broached k-file c-files		
Cleaning and shaping	Reamers k-file H-files		
Obturation	GP cones Spreader (finger/hands) Plugger Lentulo spiral Endodontic sealer(ZnoE based)		

Activity 10

Draw or paste a picture of endodontic instruments

Basic Endodontic procedure

Access cavity preparation in mandibular or maxillary premolar single rooted (extracted or simulated teeth)

Task	Instruments	Action	Assessment/ evaluation
Outline form (oval shape	Round bur	Initial entry	
	Endo z bur	De-roofing	
	Refinement	Tapper fissure bur	
Convenience form		Approach through occlusal surface	
Coronal pulp removal	Spoon/excavator	Removal of soft and infected tissue	
Location of the canals	DG-16		
Straight line access	GG burs Ultrasonic (optional		
Working length determination	k-file endodontic ruler	Estimated working length= Radiographic working length=	

Student reflection

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Step back root canal preparation technique (for reference)

Task	Instrument/Requirements	Action	Assessment
Working length determination	Radiograph Prepared access cavity k-file #15	Determine radiographic working length in millimeter For reference: WL=20mm	
Apical preparation (Depending on anatomy) For reference apical prep up to #30 k-file	k-file (15-30) MAF=30 K-FILE	Prepare the canal at full working length till # 30 k-file MAF=30	
Step back flaring	k-file(increase in one larger file #35	Prepare canal till 19mm(WL-1mm)	
	#40 file	18mm	
Recapitulation	# 15(smaller file	Up to full working length(20mm)	
Step back flaring	#45	17mm	
	#50	16mm	
Recapitulation	#15 k-file	Up to full WL(20mm)	
Step back flaring	#60	14mm	
	#70	13mm	
Verify apical prep	MAF(#30 K-File)	At full WL (20 mm)	

Student reflection

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What I did today	
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Activity 11

Step back root canal preparation technique on extracted/simulated tooth

Task	Instrument/Requirements	Action	Assessment
Working length determination			
Apical preparation (Depending on anatomy) For reference apical prep up to #30 k-file			
Step back flaring			
Recapitulation			
Step back flaring			
Recapitulation			
Step back flaring			
Verify apical prep			

Student reflection

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What I did today	
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Obturation of the root canal

- Instruments / materials needed
- Gutta percha cone (15-40)
- Endodontic sealer (Zn O Euginol based sealer)
- Finger spreader
- Plugger
- Paper points
- Endodontic ruler
- GP cutter
- Temporary restoration

Task	Instruments	Action	assessment
Pre-obturation requirements • MAF determined • Working length			
	• #30 file (reference) • 20 mm		
Sealer application	Lentulo spiral k-file	Coat the canal up to full working length	
Master cone placement	#30 GP cone(reference)	• Insert at full working length(20 mm reference) • Slight tug back resistance • verify with PA x-ray	
Accessory cone	#25 cone (reference)	Insert cone into space around master cone	
Cold lateral condensation	Finger spreader # 25 cone	Condense using finger spreader to create space for accessories cone	
		Repeat spreader + cone insertion until no space remains	
Coronal trimming	GP cutter Heated instrument	Cut and remove GP at canal orifice with heated instrument	
Temporary restoration	Temporary cement	Fill all the access cavity with temporary filling	

Activity #12

Obturation of prepared root canal

Task	Instruments	Action	assessment
Pre-obturation requirements • MAF determined • Working length			
Sealer application			
Master cone placement			
Accessory cone			
Cold lateral condensation			
Coronal trimming			
Temporary restoration			

Student reflection

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Clinical notes for review

Class 3 composite Restoration - Clinical Technique

- **Case Selection & Evaluation**
    - Indicated for anterior proximal caries without significant incisal edge involvement
    - Assess esthetic demands, occlusion, contact points, and accessibility
    - Radiographic evaluation for depth, caries extension, and pulp proximity
- **Shade Selection**
    - Perform before tooth dehydration
    - Use cervical, middle, and incisal shade zones if required
    - Utilize natural daylight or color-corrected light sources
- **Isolation**
    - Rubber dam recommended for moisture control and access
    - Gingival retraction cord or wedges if involvement near gingiva
- **Cavity Access**
    - Lingual approach preferred for esthetics and to preserve labial enamel
    - Minimal access outline maintaining marginal ridge strength
    - Use small round burs/hand instruments for caries removal
- **Tooth Preparation**
    - Remove caries conservatively without undermining enamel
    - Preserve facial enamel to avoid visible margins
    - Bevel enamel margins on accessible areas to improve blending & bonding (except on gingival margins near cementum/dentin)
    - Ensure smooth internal walls for composite adaptation
- **Enamel/Dentin Conditioning**
    - Apply etchant (phosphoric acid 35–37%) to enamel (15–20 sec) and dentin (10–15 sec)
    - Rinse thoroughly and gently air-dry (avoid over-drying dentin)
    - Apply dentin bonding agent as per manufacturer instructions and light cure
- **Matricing & Wedging**
    - Use Mylar (celluloid) strip for proximal contouring
    - Insert wedge to separate teeth and adapt strip at gingival margin
    - Ensure emergence profile and contact are maintained
- **Composite Placement**
    - Use incremental layering to minimize polymerization shrinkage
    - Start from gingival/axial area moving outward
    - Adapt each layer using plastic instrument or composite brush
    - Cure each increment adequately with proper light positioning
- **Shaping & Contouring**
    - Re-establish proximal contact and natural contour
    - Remove matrix strip after initial cure to refine contours
    - Use fine instruments for marginal ridge formation
- **Finishing**
    - Use finishing burs, discs, and strips (e.g., Sof-Lex discs)

    - Finish margins especially at cervical and proximal areas
- **Polishing**
    - Use polishing pastes, cups, or points for final luster
    - Ensure smooth surface to enhance esthetics and plaque resistance
- **Final Checks**
    - Evaluate proximal contact with floss
    - Check occlusion in centric and excursive movements
    - Verify marginal integrity, color match, and surface finish

Reference: sturdevant art and science 7th edition (for detail)

Retraction Cord Placement & Technique (Summary from Sturdevant)

Purpose of Gingival Retraction

- Displace gingival tissue **temporarily** to:
    - Expose cervical margins
    - Control moisture/ crevicular fluid
    - Enhance access for finishing and bonding

Indications in Operative Dentistry

- Cervical margins extending subgingivally
- Class V restorations
- Class III/IV with gingival involvement

Types of Retraction Cords

- **Plain (non-impregnated)** → no chemicals; used when no hemostasis is required
- **Impregnated cords** (usually with **epinephrine** or **aluminum chloride**):
    - Provide **hemostasis + retraction**
    - Aluminum salts preferred when epinephrine contraindicate

Armamentarium

- Retraction cord (size based on sulcus depth)
- Cord packing instrument (non-serrated, rounded tip)
- Cotton pliers
- Hemostatic solution (if needed)
- Suction and saliva control aids

Placement Technique –single cord technique

1. **Isolation & Moisture Control**
    - Use cotton rolls, suction, or rubber dam (when possible)
    - Control bleeding before packing if needed
2. **Cord Selection & Preparation**

    - Choose diameter appropriate to sulcus depth and tissue condition
    - Cut required length (typically slightly longer than circumference of tooth)
3. **Initial Placement**
    - Place the cord on facial/lingual surface using:
        - Cotton pliers for transfer
        - Cord-packer for adaptation
4. **Packing Technique**
    - Gently push cord into sulcus using **short, intermittent, overlapping strokes**
    - Work circumferentially from one interproximal area to the other
    - Maintain **apical pressure**, not lateral pressure, to avoid tissue injury
    - Avoid tearing or lacerating gingiva
5. **Depth & Seating**
    - Cord should sit **fully in sulcus** without protruding
    - Do **not** force the cord beyond sulcus base
6. **Setting Time**
    - Allow cord to remain **3–10 minutes** (depending on bleeding control needs)
    - Time ensures adequate **tissue displacement + hemostasis**
7. **Removal Technique**
    - Remove slowly and carefully just before
        - Margin finishing
        - Restoration placemen

Advantages

- Better visibility and access
- Improved moisture control
- Enhanced marginal finishing and bonding

3. Periapical (PA) Radiograph

A. Labelling Requirements

- **Patient Name / ID**
- **Date of Exposure**
- **Tooth/Region** (e.g., 11–21, 36–37)
- **Arch** (Maxillary / Mandibular)
- **Side** (Right / Left)

B. Indications (in pre-clinical context)

- **To detect periapical pathology**
    - Periapical abscess, granuloma, cyst
- **Assessment for endodontic treatment**
    - Working length determination
    - Canal morphology
    - Master cone fit
    - Post-op obturation

- **Evaluation of alveolar bone level**

C. Interpretation Points (pre-clinical context)

- **Tooth Structure**
  - Crown integrity, caries, restorations, fractures
- **Root and Canal**
  - Number of roots/canals
  - Curvature
  - Pathological findings
- **Periapical Area**
  - PDL space (widened ,narrow or loss
  - Lamina dura (continuity-discontinuity
  - Radiolucency (abscess/cyst/granuloma)
  - Radiopacities (condensing osteitis)
- **Alveolar Bone**
  - Height, density
  - Pattern of bone loss
- **Surrounding Structures**
  - Maxillary sinus, mandibular canal, mental foramen
- **Endodontic Evaluation**
  - Working length, obturation length/density

Bitewing (BW) Radiograph

A. Labelling Requirements

- **Patient Name / ID**
- **Date of Exposure**
- **Side** (Right / Left)
- **Arch Region** (Premolar/Molar)

B. Indications (pre-clinical context)

- **Detection of proximal caries**
  - Especially in posterior teeth
- **Evaluation of restorations**
  - Overhangs, open contacts, recurrent caries
- **Assessment of alveolar crest bone levels**
  - Horizontal bone loss patterns
- **Monitoring periodontal health**

C. Interpretation Points

- **Caries Detection**

    - Proximal surface radiolucency (E1, E2, D1, D2 stages)
    - Recurrent caries around restorations
- **Restorations**
    - Overhangs
    - Open margins
    - Loose contacts
    - Cervical burnout (differentiation!)
- **Periodontal Structures**
    - Crestal bone level (distance from CEJ)
    - Bone loss type (horizontal vs vertical)
    - Furcation involvement (in molars)
- **Alveolar Bone Assessment**
    - Height relative to CEJ
    - Radiolucencies indicating periodontal defects

Reference

Sturdevant art and science 7th edition operative dentistry