

Operative Dentistry is the face of general dentistry! The idea of operative dentistry is to essentially remove any sort of decay or demineralized enamel or dentin and to refill and replace lost structure with any sort of restorative material, whether it is Amalgam, Composite or Glass Ionomer. Most of what you will see while shadowing will include operative dentistry, but it's important to know and understand the basic principles of teeth, and procedures to successfully perform restorative dentistry.

This is a general overview of the principles of restorative dentistry. In dental school, you will take 2-3 courses on restorative dentistry which will help enhance your understanding of the teeth and skills on restoring the dentition. Remember to always ask questions while shadowing; as busy as dentists can be, they truly value your interests and want to help educate

I. Basic anatomy of Teeth

A. Surfaces of teeth

1. Anterior teeth have 5 surfaces - Mesial, Distal, Facial, Lingual and Incisal
 - a) Mesial - Tooth surface towards the midline of the face
 - b) Distal - Tooth surface away from the midline
 - c) Facial - Tooth surface towards the cheek side of the mouth
 - d) Lingual - Tooth surface towards the tongue side
2. Posterior teeth have 5 surfaces - Mesial, Distal, Facial, Lingual and Occlusal
 - a) Same as above
 - b) Occlusal - Chewing surface
3. Other useful terms
 - a) Margin - The junction of an internal cavity wall within the external surface of the tooth
 - (1) Restoratively
 - b) DEJ - The junction between enamel and dentin

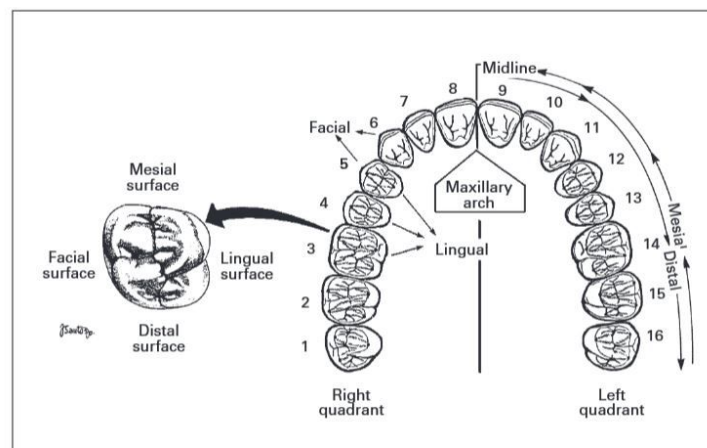


Fig 7-1 Nomenclature of directions and tooth surfaces.

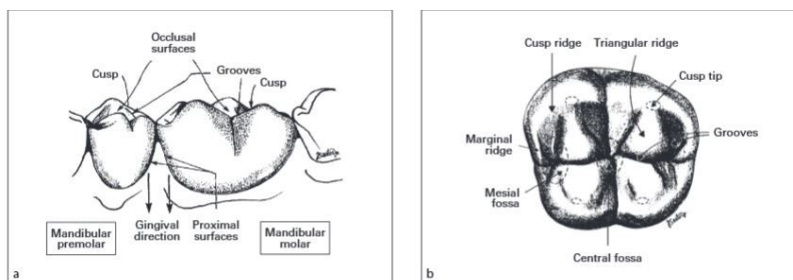


Fig 7-4 Directions, features, and tooth surfaces of posterior teeth. (a) Lingual view of mandibular right second premolar and first molar. (b) Occlusal view of mandibular right molar.

II. Instrumentation

A. Rotary

1. High speed handpiece - Used to cut and grind/mill through tooth structure
2. Low speed handpiece - Use to smoothen and shape materials and tooth structure
3. Burs - Rotary cutting instrument with a bladed head with the number of blades ranging between 6 - 30
 - a) Various different burs for operative, fixed prosthodontics, endodontics, burs for lab material, etc.

B. Hand Instruments - must grasp using a pen grasp with a finger rest to use as a fulcrum

1. All have various components including number of cutting edges, number of angles in the shaft, and action and purpose
2. Most of restorative dentistry will rely on the following
 - a) Dental Explorers - Used to check restoration margins, preps and quality of tooth structure
 - b) Dental Mirror - simple mirror
 - c) Perio Probe - Used to measure anything in millimeters
 - d) Spoon excavator - Remove decay or decalcified enamel
 - e) Margin trimmer - Distal or mesial

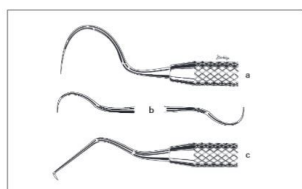


Fig 7-51 Dental explorers: (a) no. 23 explorer (shepherd's hook); (b) 3CH explorer (cowhorn or pigtail); (c) no. 17 explorer.

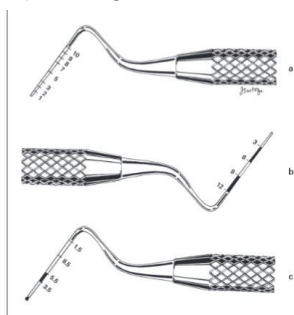
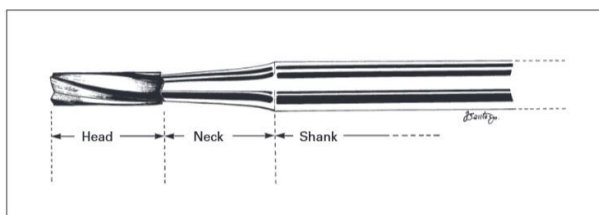


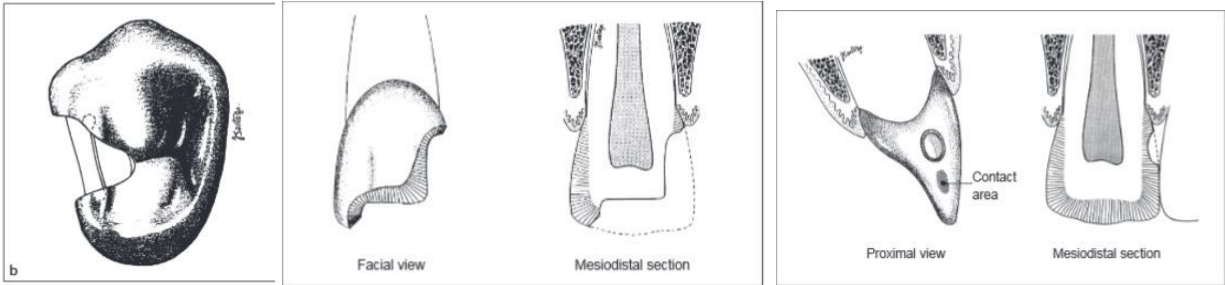
Fig 7-52 Periodontal probes: (a) OGW probe (Michigan O probe with Williams markings); (b) PCP12 probe (Marquis markings); (c) PSR (periodontal screening and recording) probe.



III. Types of Restorations

- A. In most cases, it is important to remove all the decayed material and questionable tooth structure to prepare for the restorative material. In some cases, some affected dentin and even carious lesions may be left behind (if it were too close to the pulp) and covered with a liner; these are done on a case-by-case basis.
- B. **Class I** - Restoration that includes all pits and fissures of all teeth, and occlusal surfaces

- C. **Class II** - Proximal surfaces of posterior teeth (Mesial and Distal)
- D. **Class III** - Proximal surfaces of anterior teeth that DO NOT involve the incisal angle
- E. **Class IV** - Proximal surfaces of anterior teeth that DO involve the incisal angle
- F. **Class V** - Gingival third of facial and lingual surfaces of all teeth
- G. Restorations are named based on the surfaces that are prepped with priority going to proximal → facial/lingual; examples include: MOD, OL, DF, F, DO, O, etc.



IV. Types of Restorative Material

A. Amalgam

1. Advantages - Strong, durable, easy to use, inexpensive, safe
2. Disadvantage - Not esthetic, cannot bond/adhere to tooth, contains mercury*
3. Requires proper retention, resistance and convenience form of the prep so that amalgam can remain in the prep; there is nothing actively keeping the material bonded to the tooth other than the prep.
4. Amalgam is densely packed into the prepped tooth and allowed to hardened

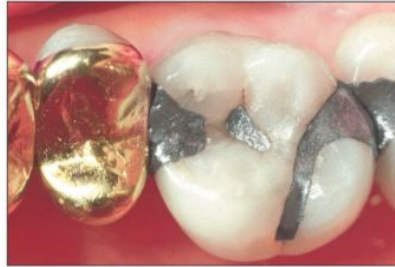
B. Composite - Consists of a mixture of two or more materials, typically containing an organic resin matrix, an inorganic filler and a coupling agent

1. Various classes of composites based on the size of the filler particles they contain, including traditional, microfill, hybrid, microhybird, and nanofill/nanohybrid
2. Material is polymerized via light source
3. Material needs to be bonded to the tooth structure via a bonding system, usually requiring the tooth to be acid etched (via phosphoric acid), primed and bonded using either a 4th, 5th, or 6th generation bonding system.
 - a) There are various bonding systems, used in private offices and dental offices, all with various caveats but all work well and it depends on the preference of the practitioner.
 - b) Comes in various shades and hues, which will be chosen based on each patient

C. Glass Ionomer

1. Consists of an acid-reactive glass powder and a polyacrylic acid that produces a stronger cement that could be used for cementation as well as a restorative material
2. Greater restorative material to use if concerned about bond to dentin and/or recurrent decay (given fluoride release)

3. Requires polyacrylic acid to help bond to prepped area



V. The Preparation

- A. Remove the diseased, fractured, weakened or defective tooth structure; only remove what's necessary
- B. Conserve important tooth structure and leave tooth ready to receive restorative material
- C. Restore tooth with predetermined restoration, creating proper form and function
 1. Includes polishing and removing any excess restorative material, as well as ensuring margins between tooth and restorative material are closed
- D. Important to verify carious lesion through radiographs, use of overhead light and with a dental explorer before beginning preparation.

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