Fixed prosthodontics is the division of dentistry which includes replacement and/or restoration of teeth by artificial substitutes that are not readily removed from the mouth which include crowns, bridges and implant supported restorations. These are very intricate and meticulous tooth preparations that rely on the retention and resistance form of the prepped tooth, the path of draw and the amount of reduction of each tooth

Fixed prosthodontics are a great option to restore teeth that have lost structure through carious lesions or traumatic means. It is important to give the patient all the options available and even combine various styles to obtain the best outcome for the patient. Digital dentistry, including CAD/CAM crowns are the new era of dentistry so it's important that dentists and dental students know some of the basics of these restorations.

Again, this is a general overview and you will go into even greater detail in your dental career.

1. The crown prep

a. Terminology

i. **Tooth preparation** - The process of removal of diseased and/or healthy enamel, dentin and cementum to shape a tooth to receive a restoration

ii. **Finish line** → the terminal portion of the prepared tooth

iii. **Axial wall** → The surface of a tooth preparation that is in its long axis

iv. **Retention form**→ resists dislodgement of crowin in a VERTICAL direction or along the path of placement

v. **Resistance form** → Enhance the stability of a storation and resist dislodgement along an axis OTHER than the path of placement

vi. Other

1. High speed handpiece to mill through tooth structure necessary for preparation
2. Slow speed handpiece to smoothen tooth & remove any sharp area

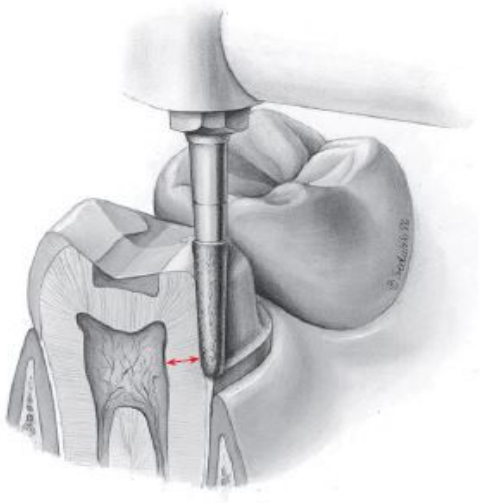


FIGURE 7-8 ■ A considerable amount of care is needed when a tooth is prepared for a complete crown, because of the extensive nature of the reduction, with many dentinal tubules sectioned. Each tubule communicates directly with the dental pulp. Maximal dentin thickness should be maintained *(arrow)*.

2. Basic principles

a. Preservation of tooth structure
b. Retention and resistance form
    i. Greater the surface area, the more retention
c. Structural durability and marginal integrity
    i. Finish line should be slightly above the gingival margin in order to preserve gingival health
d. Biological considerations - protect and preserve gingiva and pulpal tissues
e. Essentially reduce occlusally, reduce axially to proper taper, break interproximal contact with adjacent tooth structure, create smooth and adequate finish line and create functional cusp bevel.
f. Posterior teeth
    i. Prep can vary widely based on the type of restorative material used
        1. Gold crown → most conservative, with only a 1 mm occlusal reduction and 1 mm axial reduction
        2. PFM → Usually a 1.5 occlusal reduction and 1.5 mm axial reduction
        3. All Ceramic crown → usually a 2.0 occlusal reduction and a 1.5 mm axial reduction.
g. Each clinician will have their own technique or preference to the style and type of prep used. It is important that each prep is properly reduced in order for the crown to be properly cemented or luted.
h. Anterior teeth
    i. Preps will vary based on the type of restorative material used
        1. Veneers →0.5 mm axial reduction and 1 mm incisal reduction
        2. ¾ Prep → 2 mm incisal reduction and 1 mm interproximal and facial reduction
        3. All Ceramic → 2 mm incisal reduction and 1 mm axial reduction

FIGURE 8-25 ■ The completed preparation is characterized by a smooth, even chamfer margin; a 6-degree taper; and gradual transitions between all prepared surfaces.

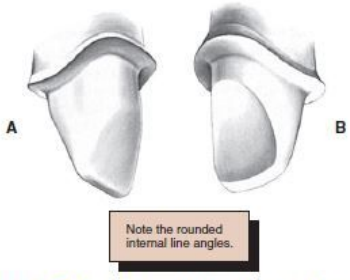


FIGURE 11-7 ■ All-ceramic crown preparation. **A**, Labial view. **B**, Lingual view. To prevent stress concentrations in the ceramic, all internal line angles should be rounded. The shoulder margin should be as smooth as possible to facilitate the technical aspects of fabrication.

3. The type of fixed restorations

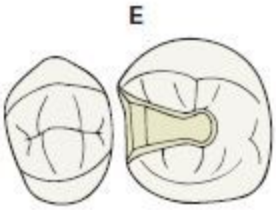
a. Each of the following are considered types of fixed restorations and should all be considered when treatment planning each and every single patient.

i. Crown

1. Includes gold crown, all ceramic crown and porcelain fused to metal (PFM) crown. Each is prepared based on the proper thickness of the material and available tooth structure.

ii. Inlay - Replacement of tooth structure with ample supporting dentin where a cusp is not replaced

iii. Onlay - Allows the damaged occlusal surface to be restored with a casting the the most conservative manner, including the replacement of a cusp



iv. Implant

1. Osseous integrated implants are generally designed to support screw- or cement-retained dental prosthesis. These implant systems offer many advantages over conventional dental restorations and one-stage implants
    a. Require surgical guide, crown, healing abutment, adequate bone height and possibly other surgical procedures to place implant as safely as possible so that anatomical structures are considered.
2. Implant supported prosthesis
    a. Overdenture - Denture supported by locators (implants)

v. Bridge

1. Contains a retainer (covers prepped tooth), connector (connects pontic to retainer), and the pontic (crown that covers the edentulous ridge)
2. Can be made as full veneers, Porcelain fused to metal or all-ceramic
3. Each tooth must be prepared ideally along its own access
4. Includes cantilever bridges, bonded “single wing” bridges, etc.

References:

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Rosenstiel, Land, Fujimoto; **Fifth edition**. Mosby Inc., St. Louis, MO