DEPARTMENT OF RESTORATIVE DENTISTRY

FIXED PROSTHODONTICS PHILOSOPHY

Current UIC College of Dentistry required textbooks for Fixed Prosthodontics

Stephen F. Rosenstiel, Martin F. Land, and Junhei Fujimoto
Contemporary Fixed Prosthodontics

John M. Powers and Ronald L. Sakaguchi
Craig's Restorative Dental Materials
Twelfth edition, Mosby.

Optional textbook for Fixed Prosthodontics

Sumiya Hobo, Lowell D. Whitsett, Richard Jacobi, and Susan E. Brackett
Fundamentals of Fixed Prosthodontics
1. DIAGNOSTIC PROCEDURES AND TREATMENT PLANNING

A. The following diagnostic procedures must be completed prior to treatment planning and the initiation of any fixed prosthodontic treatment:

- Review of medical, dental, behavioral and psychosocial history
- Intraoral, extraoral, head and neck examinations (including cancer screening)
- Documentation of patient attitudes and expectations
- Occlusal evaluation including parafunctional habits, TMJ sounds and muscle symptomology
- Interpretation of appropriate radiographic records
- Evaluation of patient's current protheses
- Diagnostic casts, properly mounted on a semi-adjustable articulator using face-bow transfer and appropriate interocclusal records (MI or CO)
- Removable partial denture design(s)
- Diagnostic wax-up(s) on duplicated diagnostic casts
- Pulp vitality testing and evaluation
- Periodontal evaluation
- Caries and periodontal risk assessments
- Alternative care (eg. Implant prosthodontics)
- Prosthodontic Diagnostic Index (PDI) to evaluate case complexity and to identify patients requiring referral for specialty care

B. Prior to the finalization of the treatment plan, the caries and periodontal risk assessments must be completed and discussed with the patient. The patient must be informed about the impact of the outcome of the caries and periodontal risk assessments on proposed and selected treatment options. Every treatment plan must include caries control and prevention methods.

C. Following the finalization of the treatment plan, the patient must be prepared for restorative treatment. The prioritization and sequencing of treatment (appointment planning) must be discussed with the supervising faculty member and indicated on the final treatment plan.

D. Prior to the final preparation appointment, the following must be completed and reevaluated by the applicable department:

- Disease control
- Endodontic treatment
- Periodontal treatment
- Oral surgical treatment, including post-operative appointments and healing
- Orthodontic treatment
2. INTRACORONAL AND EXTRACORONAL FIXED RESTORATIONS

The following fixed restorations are indicated to restore missing tooth structure, to improve esthetics, and to replace missing teeth:

1. Ceramic, indirect composite, and gold inlays
2. Ceramic and gold onlays
3. Crowns: Metal, PFM, All-ceramic
4. Porcelain veneers
5. Fixed Partial Denture: conventional, cantilever, resin bonded prosthesis

3. CLINICAL GUIDELINES FOR RESTORING AN ENDODONTICALLY TREATED TOOTH

A. Evaluation of restorability of any tooth that requires root canal treatment and evaluation for possible crown lengthening procedure must be done prior to starting the root canal therapy. All carious lesions must be removed before root canal treatment is started. If crown lengthening is indicated, it must be performed after the completion of root canal treatment and placement of provisional restoration.

B. Selection of the type of the final restoration for an endodontically treated tooth must be based on the remaining coronal tooth structure.

1. Direct restorations (composite) may be considered ONLY for anterior teeth with minimal loss of tooth structure: one or two small proximal lesions and a conservative access cavity preparation, esthetics are acceptable.

2. Indirect restorations (onlay or crown) are indicated in the following situations:
   - Anterior teeth, if extensive coronal damage and/or poor esthetics exist
   - All posterior teeth (all posterior teeth with RCT must be restored with crown/onlay)

If indirect restoration is indicated, selection of the type and placement of post and core must be completed after the tooth is prepared for indirect restoration.

C. Post space preparation must meet the following criteria:
   - 4 to 5 mm of apical gutta percha seal must be maintained
   - Post length must be at least equal to the length of the clinical crown of the final restoration or at least 2/3 the length of the root in bone, whichever is greater
   - Post space width must NOT exceed 1/3 of the cross-sectional root diameter
   - Prepared axial walls must be at least 1 mm wide
   - Positive horizontal stop at the opening of the post space must be present to prevent overseating of the post, which may wedge in the root and cause a vertical fracture
- If the configuration of the canal is circular in cross section, a small groove will be prepared in the canal along the path of placement of the cast post and core to prevent rotation of the post.
- Ferrule effect – minimum of 1.5 - 2.0 mm of sound coronal tooth structure must be present from the core margin to the finish line of the tooth preparation.
- If ferrule is absent, the following must be considered:
  - surgical crown lengthening
  - orthodontic extrusion
  - extraction and implant care

D. The following foundation restorations are recommended:

1. **Core build-up**: composite resin or amalgam
   
   The core build-up is indicated when there are at least two remaining sound axial walls at least 1 mm wide, more than 3 to 4 mm high, and the core may be retained by gross extension into the pulpal chamber. Other remaining axial walls must be at least 1.5 – 2.0 mm high.

2. **Cast post and core** is indicated for teeth with:
   - inadequate remaining coronal tooth structure to retain a core build-up and the final restoration
   - adequate ferrule of 1.5 - 2.0 mm of sound coronal tooth structure from the core margin to the finish line of the tooth preparation
   - flared or elliptical canals where prefabricated posts will not provide sufficient retention
   - canals that are too large for any prefabricated post system
   - anterior teeth where the prefabricated post does not extend to the incisal edge of the tooth preparation for support of the core build-up material
   - single-rooted teeth, especially incisors and canines

3. **Prefabricated post and core build-up** (composite resin, amalgam) core is indicated for teeth with:
   - at least one remaining axial wall at least 1 mm wide and more than 3 to 4 mm high and other remaining axial walls at least 1.5 – 2.0 mm high
   - teeth with small circular canals
   - teeth with root canals angled excessively from the post path of insertion making the construction of a cast post-and-core impossible
   - teeth with excessive undercut tooth structure inside the chamber where preparing post room for the cast core may result in excessive removal of sound tooth structure, consequently compromising the integrity of the tooth

E. The following techniques are recommended to fabricate a cast post and core:

1. Indirect technique: PVS impression of the post space
2. Direct technique: fabrication of post and core resin pattern
F. The following types of materials are recommended for post:
   1. Cast post and core: noble or high noble alloy
   2. Prefabricated post:
      - Metal (Parapost XT, XP)

4. SHADE SELECTION

Shade selection should be accomplished at the beginning of the appointment prior to tooth desiccation. Vita shade guide and multiple light sources, including daylight, are used to select the shade. Selected shade for the final restoration should be recorded in the patient’s record. The same shade should, if possible, be used for the provisional restoration to allow for evaluation and patient satisfaction. The shade should be verified at subsequent appointments.

5. TOOTH PREPARATION PRINCIPLES, MARGIN DESIGN, AND SELECTION OF MATERIALS

Students must work with the same instructor for all steps involved in fabrication of all fixed restorations. The steps include: initial preparation of tooth/teeth, provisionalization, final impression, try-in, and final cementation.

Teeth should be prepared to exhibit the following characteristics: 10-20 degrees of total occlusal convergence, a minimal occlusocervical dimension of 4 mm for molars and 3 mm for other teeth. Axial wall reduction, occlusal reduction, finish line and margin type selection should be based on the type of crown/retainer, and esthetic requirements.

A. Metal crown
   - Axial reduction: 1.0-1.25 mm
   - Occlusal reduction: 1.25-1.5 mm clearance with opposing teeth
   - Finish line: Chamfer finish line
   - Alloy type: Noble or high noble alloy

B. PFM crown
   - Axial reduction: 1.25-1.5 mm
   - Occlusal reduction: 1.5-2.0 mm clearance with opposing teeth
   - Finish line: Shoulder/deep chamfer all around; shoulder/deep chamfer to proximal contact area and lingual chamfer finish line
   - Margin design for the restoration:
     - disappearing margin all around
     - disappearing margin on facial extended to proximal contact area and metal collar on lingual
     - porcelain butt-joint on facial only for anterior teeth and premolars
   - Alloy type: Noble or high noble alloy
C. All-ceramic crown (limited only to anterior single unit restorations)
   - Axial reduction: 1.25-1.5 mm
   - Occlusal reduction: 1.5-2.0 mm clearance with opposing teeth
   - Finish line: Rounded shoulder/deep chamfer all around
   - Ceramic type: Zirconia, Procera alumina, glass ceramics

D. Porcelain veneer
   - Labial reduction: 0.5 – 1.0 mm
   - Interproximal extension: Extended to gingival crest, leaving contact area intact
   - Finish line: Chamfer
   - Incisal reduction: None or 1.0 mm when incisal margin is extended to the lingual to allow lengthening
   - Preparation must be mostly within enamel

E. Inlays

1. Metal Inlays:
   - All carious occlusal fissures and defects must be included
   - Isthmus width 1.0 – 1.5 mm
   - Pulpal wall entirely in dentin with appropriate depth 1.5 – 2.0 mm
   - Buccal and lingual vertical walls of occlusal and box are divergent 4-10°
   - Axial wall 1.0-1.25 mm deep, parallels occlusal plane
   - Axial wall has appropriate contour and convergence to long axis
   - Axio-pulpal line angle properly rounded or beveled
   - MO or DO preparations: Marginal ridge is supported by sound dentin, 1.5 mm mesio-distal width
   - Cavosurface bevels 0.5-1.0 mm wide and 40° angle
   - Alloy type: Noble or high noble alloy

2. Tooth-colored Inlays (ceramic or indirect composite):
   - All carious occlusal fissures and defects included
   - Isthmus width 1.5 – 2.0 mm
   - Pulpal wall entirely in dentin with appropriate depth 1.5 – 2.0 mm
   - Buccal and lingual vertical walls of occlusal and box are divergent 12-20°
   - Axial wall has appropriate contour and convergence to long axis
   - Axial wall 1.0-1.5 mm deep, parallels occlusal plane
   - MO or DO preparations: Marginal ridge is supported by sound dentin, 1.5 mm mesio-distal width
   - Axio-pulpal line angle properly rounded or beveled
   - Uniform 90° cavosurface butt-joint margin
   - Ceramic type: Glass ceramics
F. Onlays

1. Metal Onlays
   - All carious occlusal fissures and defects included
   - Isthmus width 1.0 – 1.5 mm
   - Box wall extensions appropriate proximally and gingivally
   - Pulpal wall entirely in dentin with appropriate depth 1.0 mm
   - Axial wall in dentin with appropriate contour and convergence to long axis
   - Gingival floor 1.0-1.25 mm wide, parallels occlusal plane
   - Buccal and lingual vertical walls of occlusal and box are divergent 4-10°
   - Axio-pulpal line angle properly rounded or beveled
   - Centric cusps uniformly reduced with 1.25-1.5 mm clearance with the opposing teeth
   - Shoulder with bevel placed on centric cusp
   - Non-centric cusps uniformly reduced with 1.25-1.5mm clearance with the opposing teeth
   - External bevel 1.0 – 1.5 mm wide placed on the non-centric cusp
   - Cavosurface bevel 0.5-1.0 mm wide and 30 - 40° angle
   - Alloy type: Noble or high noble alloy

2. Tooth-colored Onlays (ceramic or indirect composite):
   - All carious occlusal fissures and defects must be included
   - Isthmus width 1.5 – 2.0 mm
   - Box wall extensions appropriate proximally and gingivally
   - Pulpal wall entirely in dentin with appropriate depth 1.0 mm
   - Axial wall in dentin with appropriate contour and convergence to long axis
   - Gingival floor 1.0-1.25 mm wide, parallels occlusal plane
   - Buccal and lingual vertical walls of occlusal and box are divergent 6-10°
   - Axio-pulpal line angle properly rounded or beveled
   - Centric cusps uniformly reduced with 1.5-1.75 mm clearance with the opposing teeth
   - Rounded shoulder or deep chamfer placed on centric cusp
   - Non-centric cusps uniformly reduced with 1.5-1.75mm clearance with the opposing teeth
   - Line angles are properly rounded
   - Cavosurface butt-joint margin uniform and distinct
   - Ceramic type: Glass ceramics

G. Resin-bonded fixed dental prosthesis

1. A resin-bonded FPD is indicated to replace a maxillary incisor, mandibular incisor, or mandibular bicuspid. The retentive retainers (wings) must extend one tooth mesial and distal when a single tooth is replaced. Base metal alloys are used to fabricate the framework for the resin-bonded FPD.
2. Abutment preparation for an anterior resin-bonded prosthesis
   - Lingual reduction: 0.3 - 0.5 mm, chamfer finish line located 0.5 – 1.0 mm supragingivally
   - Proximal extension next to the edentulous space: extended beyond the interproximal contact area toward the proximofacial line angle to provide an adequate connector area for the pontic
   - Proximal extension on the opposite side of the tooth: extended to the interproximal contact areas with chamfer finish line at the gingival and facial outlines
   - Incisal extension: maximum extension to increase bonding surface; a feather-edge finish line
   - Proximal grooves: placed on the proximal surfaces next to the edentulous space. They must be parallel to each other in the faciolingual plane parallel to the axis of insertion, and at least 0.5 mm occlusal to the gingival margin
   - Positive seat preparation: cingulum rests are prepared on anterior abutments

3. Abutment preparation for a posterior resin-bonded prosthesis
   - Lingual reduction: 0.3 - 0.5 mm, with gingival chamfer finish line located 0.5 – 1.0 mm supragingivally, and a feather-edge occlusal finish line apical to the occlusal contacts
   - Proximal extension next to the edentulous space: Extended beyond the interproximal contact area toward the proximofacial line angle to provide an adequate connector area for the pontic
   - Proximal extension on the opposite side of the tooth: extended to the interproximal contact areas with chamfer finish line at the gingival and facial outlines, and a feather-edge occlusal finish line
   - Occlusal rest: 0.5 mm deep and 1.5 – 2.0 mm in diameter, placed in the proximal marginal ridge area of the abutments adjacent to the edentulous space
   - Proximal grooves: placed through the center of the occlusal rest. They must be parallel to each other in the faciolingual plane, parallel to the axis of insertion, and at least 0.5 mm occlusal to the gingival margin

6. PROVISIONALIZATION

A. Any tooth requiring an extracoronal fixed restoration must receive a custom fabricated provisional based upon a diagnostic wax-up. The provisional must be made with an autopolymerizing resin or Bis-acryl resin. Provisional restoration must provide a trial stage for the final restoration in terms of function, contour and esthetics. The ideally contoured provisional restoration should also be used to evaluate the adequacy tooth preparation.
B. Provisional restoration must satisfy the following requirements:
- Cover exposed dentin in order to protect the pulp from chemical, bacterial, and thermal irritation
- Maintain periodontal health: good margins, contour, and non-irritating surface texture
- Prevent tooth fracture
- Maintain the position of prepared teeth and prevent extrusion of opposing teeth
- Permit normal function of the masticatory system by restoring occlusion
- Maintain patient’s normal occlusion or establish proper occlusal contacts
- Easily reline after preparation modifications
- Proper anatomy and color

C. Provisionalization methods include: PVS Putty, Shell, and Vacuum-formed mold.

D. Preformed polycarbonate provisional crown may be used only in emergency situations. Polycarbonate crown must be relined with acrylic resin, trimmed, and polished before it can be cemented with temporary cement.

E. The following cements should be used for provisional restorations:
   1. Zone
   2. Temp-bond (with or without eugenol)
   3. Durelon - may be used in some situations for non-retentive provisionals, or for longer term provisionalization while other therapy (e.g. perio) is being completed.

7. PONTIC DESIGNS

A. Ovate pontic design is recommended for anterior pontics. Ovate pontic must have the following characteristics:
   - Convex tissue resides in a soft tissue depression in the residual ridge
   - Appearance of a tooth emerging from the gingiva

B. Modified ridge lap pontic design is recommended for most anterior and posterior pontics. Modified ridge lap pontic must have the following characteristics:
   - Overlaps the residual ridge on the facial side to achieve the appearance of a tooth emerging from the gingiva
   - The lingual side of the pontic must NOT contact the ridge to enable optimal plaque control
   - The gingival surface should be as convex as possible from mesial to distal aspect
   - Tissue contact should resemble a letter T with the vertical arm ending at the crest of the ridge
   - Contact between the pontic and tissue must be pressure free
   - Gingival embrasures around the pontic must be wide enough to permit oral hygiene aids, such as floss threaders, proxy brush, or super floss
- Connectors should have sufficient occlusal-gingival and buccal-lingual dimensions to resist deformation and/or fracture

C. Ridge lap (saddle) pontic must be avoided because the concave gingival surface of the pontic is not accessible to cleaning with dental floss.

8. IMPRESSION MAKING AND SOFT TISSUE RETRACTION

A. The previously selected shade of the final restoration must be verified at the beginning of the appointment before the final impression is made.

B. Final impression for indirect restorations (onlay, crown, FPD) will NOT be made at the initial preparation and provisionalization appointment.

C. Final impression will not be made sooner than 6-8 weeks after extraction of tooth to be replaced by a pontic during FPD fabrication. The extraction site must be evaluated after 6-8 weeks for proper healing. If tissue is not healed, additional time must be allowed before final impression making.

D. Tissue management includes the following methods:
   - Single chemico-mechanical cord technique
   - Double chemico-mechanical cord technique
   - Both techniques involve placement of retraction cord impregnated with Hemodent or Astringedent

E. Electrosurgery may be used for minor hyperplastic tissue removal before impression making. It should not be used routinely for tissue retraction as part of final impression. After tissue removal, cord placement precedes impression making.

F. Making the final impression
   - Full arch impressions must be made for any indirect restoration
   - All margins of the preparations, edentulous spaces to be restored with FPD, and all teeth in the arch must be captured without voids
   - Rigid plastic stock trays with the appropriate adhesive must be used
   - The adhesive should be allowed to dry at least 10 minutes after painting the tray
   - PVS impression material must be used for all final impression of indirect restorations
   - Double mix technique using light and heavy body material is recommended

G. Alginate impression of the provisional and the opposing arch must be made. Impressions must capture all teeth and must be free of voids.
H. Mounting of the working cast
   1. Working cast is mounted in maximum intercuspation when fabricating:
      - 1 or 2 single units of anterior or posterior crowns or
      - 3 or 4 units of posterior single crowns or FPDs or
      - 3 to 6 units of anterior single crowns or FPDs
   2. Working cast is mounted in centric occlusion/centric relation when:
      - Opposing arch is restored with a complete denture

I. Interocclusal record
   - If the casts can be hand articulated with an opposing cast and the casts are stable, an interocclusal record is not needed
   - PVS material must be used to take the interocclusal record
   - Interocclusal records must be made only in the area of the preparations and the opposing teeth when mounting in MIP
   - The recording material must not extend to adjacent unprepared teeth and the record must be made with the remaining teeth in contact at the patient’s VDO
   - For CO records - there must be minimal occlusal opening, and minimal PVS material must cover the occlusal surfaces only

J. Record base and wax rim must be used if a vertical stop exists between working and opposing casts but four point contacts are not present. An elastomeric bite registration material is the material of choice in conjunction with a record base and wax rim. The record is taken with any remaining teeth in contact. The record is obtained at a subsequent appointment so that a record base and wax rim can be fabricated on the final working cast.

9. TRY-IN AND ADJUSTMENT OF FINAL INDIRECT RESTORATIONS

A. Previously selected shade of the final restoration should be verified again during the metal framework try-in appointment.

B. Framework try-in for metal-ceramic fixed partial dentures:
   - All frameworks must be evaluated for marginal adaptation, metal thickness, and connector dimensions before porcelain application.
   - If esthetics are of concern, the display of any facial gingival metal collars must be noted and the laboratory must be requested to thin.
   - If the framework does not seat completely, it may need to be sectioned between one of the abutments and a pontic. This will allow assessment of the individual retainers separately. If they seat well independently, the framework must be indexed with pattern resin and soldered. If the framework requires sectioning and soldering, another try-in appointment will be necessary.
   - Mounting must be verified and if necessary a new interocclusal record must be taken with the metal framework in place. Casts must be remounted before sending it back to the laboratory for porcelain application.
C. Adjustment of single unit prostheses and fixed partial dentures before final cementation:
- Interproximal contacts must be checked and adjusted with accufilm articulating film and floss.
- Internal fit must be checked and adjusted using Fit-checker.
- Marginal fit must be checked with a sharp explorer.
- Occlusion must be checked using accufilm articulating film. Centric and eccentric adjustments must be made.
- Pontic-tissue relationships must be checked and adjusted.
- All metal restorations must be repolished after all adjustments are completed.
- Metal-ceramic and ceramic restorations should be polished or reglazed if extensive adjustments were done.
- Patient and instructor approval of the final restoration must be obtained before final cementation.

10. CEMENTATION OF FINAL INDIRECT RESTORATIONS

The following cement should be used for final cementation of indirect fixed restorations:

A. Glass ionomer cement: gold inlays and onlays, cast post and cores, gold and PFM crowns, FPDs

B. Resin modify glass ionomer cement: gold inlays and onlays, gold and PFM crowns, Zirconia crowns, Procera Alumina crowns, FPDs

C. Resin cement: ceramic inlays and onlays, porcelain veneers, prefabricated posts, cast post and cores, gold, PFM and all-ceramic crowns (Zirconia, Procera Alumina, Glass ceramic), Resin Bonded Fixed Partial Dentures

D. Cementation procedures for all-ceramic restorations (Glass ceramics ONLY):

<table>
<thead>
<tr>
<th>Restoration</th>
<th>Preparation</th>
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<tbody>
<tr>
<td>1. Apply etching gel (hydrofluoric acid) to the fitting surface only.</td>
<td>1. Rubber dam isolation.</td>
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<tr>
<td>2. Very carefully rinse away gel under running water.</td>
<td>2. Clean preparation with pumice and water.</td>
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<tr>
<td>3. Dry the ceramic with air and ensure that the ceramic is not contaminated.</td>
<td>3. Etch preparation with phosphoric acid and rinse. Remove excess water with a brief burst of air. Surface must be moist.</td>
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<tr>
<td>4. Apply the silane to the ceramic according to the manufacturer’s recommendation.</td>
<td>4. Apply a thin layer of resin-bonding agent to the preparation according to the manufacturer’s recommendation.</td>
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<tr>
<td>5. Mix composite resin luting agent according</td>
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6. Apply composite resin luting agent to the restoration and seat the restoration carefully to avoid trapping air.

7. Dual cure is recommended for inlays, onlays, and crowns. Light cure is recommended for veneers.

8. Position the restoration gently, removing excess luting agent with an instrument.

9. Hold the restoration in place while light-curing the resin.

11. MAINTENANCE AND RECALL

At the delivery appointment of fixed prostheses, patients should be given thorough instructions for home care and maintenance. Recall appointments should be scheduled at a minimum of six month intervals. Complex or periodontally involved cases may need to be examined in shorter intervals, possibly every three months.

Recall appointments at a minimum should include:

A. Head and neck examination (oral cancer screening)

B. Periodontal evaluation (evaluation of bleeding points, probing depths, mobility, furcation involvements, etc.)

C. Oral hygiene reinforcement (including caries activity assessment follow-up)

D. Prophylaxis, scaling, root planning, as needed

E. Restorative examination, including the evaluation of all remaining teeth and restorations for caries, marginal integrity, esthetics and function

F. Occlusal examination and any necessary minor occlusal adjustments

G. Radiographic evaluation (only as needed) based on the above findings

12. USING A COMMERCIAL LABORATORY FOR FABRICATION OF INDIRECT RESTORATIONS

A. All final impressions are sent to the laboratory for working cast construction.
B. Fabrication of a single unit restoration (except canine): Working cast fabrication, trimming of a die, and mounting of a working cast is completed by the laboratory. Trimming of dies may be completed by the student as requested by the supervising instructor. Working cast can be mounted by the laboratory on the hinge articulator using an appropriate interocclusal record in maximum intercuspation position at the patient’s occlusal vertical dimension.

C. Fabrication of a canine restoration, multiple single unit restorations, and FPD: Working cast fabrication and trimming of dies is completed by the laboratory. Trimming of dies may be completed by the student as requested by the supervising instructor. Working cast must be mounted by the student on a semi-adjustable articulator using an appropriate interocclusal record as indicated above. After mounting is completed, the case can be submitted to the laboratory.

D. Fabrication of crown as abutment for RPD: Working cast fabrication and trimming of a die is completed by the laboratory. Trimming of dies may be completed by the student as requested by the supervising instructor. Abutment crowns must be surveyed to ascertain proper contour, undercut location for RPD. Working cast must be surveyed, tripoded, and mounted by the student.

E. Fabrication of single unit implant supported restoration: soft tissue working cast fabrication must be completed by students. Working cast must be mounted by the student on a semi-adjustable articulator using an appropriate interocclusal record as indicated above. After mounting is completed, the case can be submitted to the laboratory.

F. Required items for submitting cases to the laboratory:

1. Mounted cast of provisional restorations
2. Mounted working casts
3. Impressions
4. Margin die (if necessary)
5. Articulator (adjusted according to the patient records)
6. Custom incisal guide table for fabrication of a canine crown or multiple anterior restorations
7. Complete and concise laboratory prescription
8. Fabrication of crown which is an abutment for RPD:
   - Surveyed and tripoded working cast
   - Diagnostic cast with framework design drawn on it
   - Framework design drawn on the prescription
9. Fabrication of implant supported crown:
   - Soft tissue working cast mounted on articulator
   - Diagnostic wax-up or Diagnostic cast with existing tooth before implant placement
   - Abutment
   - Burn out coping, if indicated
13. CRITICAL CRITERIA FOR FABRICATION OF FIXED RESTORATIONS

A. Students must work with the same instructor for all steps involved in fabrication of all fixed restorations. The steps include: initial preparation of tooth/teeth, provisionalization, final impression, try-in, and final cementation.

B. All posterior teeth with completed root canal treatment must be restored with extracoronal indirect restoration (onlay or crown).

C. Full arch impression must be taken for fabrication of all indirect fixed restorations.

D. Final impression for indirect restorations (onlay, crown, FPD) will NOT be made at the initial preparation and provisionalization appointment.

E. Electrosurgery is used only for minor hyperplastic tissue removal before impression making. After tissue removal, cord placement precedes impression making. It should not be used routinely for tissue retraction as part of final impression. After tissue removal, cord placement precedes impression making.

F. The working cast for fabrication of a canine restoration multiple single unit restorations and the fixed partial denture must be mounted by the student on the semi-adjustable articulator.

G. Trimming of dies may be completed by the laboratory or by the student as determined by the supervising instructor.

H. Ferrule effect of a minimum of 1.5 - 2 mm must be present for all endodontically treated teeth to be restored with extracoronal restorations.

I. When fabricating fixed restorations opposing a complete denture, the wax try-in of a denture must be performed with provisional restorations in place to establish the proper plane of occlusion and interocclusal relation.

J. Resin Bonded FPD guidelines: There must be adequate enamel and sound tooth structure for preparation and etching. The occlusal clearance and prep must allow adequate interocclusal space. Single tooth replacement only. Patients with Class III and/or reverse articulation (crossbites) must not be treated with resin bonded FPD’s.

K. All-Ceramic Restorations must be limited to anterior teeth.

L. Porcelain Butt margin must be limited to anterior teeth and premolars.
14. FIXED PROSTHODONTIC TREATMENT GUIDELINES

The following treatment will not be allowed in the undergraduate dental clinics:

A. Treatment involving any change in the patients presenting occlusal vertical dimension (e.g., opening, restoring, re-establishing). The only exception are patients with at least one completely edentulous arch.

B. Fixed prosthodontic rehabilitation involving bilateral posterior reconstruction where the stability of the posterior occlusion may be interrupted. At least one posterior occlusal vertical stop must be maintained as part of any fixed care.

C. Fixed prosthodontic rehabilitation involving more than 4 connected units.

D. Anterior esthetic rehabilitation involving more than 4 adjacent units.

E. No more than a total of 6 units of Fixed Prosthodontic care can be treatment planned for a patient, including all single and FPD units. Exceptions to this may be considered up to 7 and a maximum of 8 units. However, the prosthodontic consultant and Managing Partner must review and approve the exception (7-8 units of fixed prosthodontic care) in Axium.

F. Anterior esthetic rehabilitation involving indirect porcelain veneers must be performed by students indicated by Managing Partners based on student ability and experience.

G. Semi-precision or precision attachments for fixed prostheses.

H. A cantilevered FPD may be indicated for replacing a maxillary or mandibular lateral incisor. They may also be considered for a maxillary or mandibular premolar when opposed by a removable prosthesis. When a premolar cantilever FPD is utilized it must include double abutments. Lateral incisor cantilevers can use canines as single abutment.

All patients that a cantilever FPD is being considered for must have an implant consultation (room 311) prior to completion of the treatment plan and the initiation of any care involving the area under consideration.

I. A resin-bonded FPD is indicated ONLY to replace a maxillary incisor, mandibular incisor, or mandibular bicuspid.

There will be no exceptions to the above guidelines, unless approved in writing by one of the Managing Partners. These treatment limitations should not, however, interfere with student learning through discussions of treatment planning options which may include the above. If a patient requests any of the above therapies during the treatment planning process, s/he should be referred to, prosthodontic specialty program, or to the faculty dental practice for evaluation.
Note: The following chart lists UIC approved restorative materials. Any substitutions must be approved by the restorative department dental materials advisory committee and the department chair.

<table>
<thead>
<tr>
<th>Company</th>
<th>Product Name (current choice)</th>
<th>Material Category</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parkell</td>
<td>Snap</td>
<td>Acrylic Resin</td>
<td>EMA</td>
</tr>
<tr>
<td>Lang</td>
<td>Jet</td>
<td>Acrylic Resin</td>
<td>PMMA</td>
</tr>
<tr>
<td>Caulk</td>
<td>Regisil PB (CaulK)</td>
<td>Bite registration material</td>
<td>PVS</td>
</tr>
<tr>
<td>Bisco</td>
<td>All-Bond 2</td>
<td>Bonding System</td>
<td>(4\textsuperscript{th} Generation) Multi-bottle</td>
</tr>
<tr>
<td>Kerr</td>
<td>Optibond Solo Plus (unit dose)</td>
<td>Bonding System</td>
<td>(5\textsuperscript{th} Generation- “one bottle system”)</td>
</tr>
<tr>
<td>3M/ESPE</td>
<td>Ketac Cem</td>
<td>Cement</td>
<td>Glass Ionomer</td>
</tr>
<tr>
<td>Ultradent</td>
<td>UltraTemp</td>
<td>Cement</td>
<td>Polycarboxylate</td>
</tr>
<tr>
<td>Dentsply/Caulk</td>
<td>Calibra</td>
<td>Cement</td>
<td>Resin – Dual-cure or chemically initiated</td>
</tr>
<tr>
<td>GC America</td>
<td>Fuji-Cem (paste-paste)</td>
<td>Cement</td>
<td>Resin-modified glass ionomer</td>
</tr>
<tr>
<td>Dentsply/Caulk</td>
<td>IRM</td>
<td>Cement</td>
<td>Temporary</td>
</tr>
<tr>
<td>Kerr</td>
<td>Tempbond NE</td>
<td>Cement</td>
<td>Temporary</td>
</tr>
<tr>
<td>Dux Dental</td>
<td>ZONE</td>
<td>Cement</td>
<td>Temporary</td>
</tr>
<tr>
<td>Schein</td>
<td>ZnPO\textsubscript{4} cement (Schein)</td>
<td>Cement</td>
<td>Zinc Phosphate</td>
</tr>
<tr>
<td>Bisco</td>
<td>Bis-Core – Dual Cure Natural and Opaque</td>
<td>Core build-up material</td>
<td>Dual Cured resin</td>
</tr>
<tr>
<td>Bisco</td>
<td>Bis-Core (Blue or tooth colored)</td>
<td>Core build-up material</td>
<td>Light cured resin</td>
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<tr>
<td>Ultradent</td>
<td>Ultradent</td>
<td>Etchant or dentin conditioner</td>
<td>35-37% phosphoric acid gel</td>
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<tr>
<td>GC America</td>
<td>Fit-checker</td>
<td>Fit checker</td>
<td></td>
</tr>
<tr>
<td>Ultradent</td>
<td>Viscostat</td>
<td>Hemostatic agent</td>
<td>Ferric sulfate 20%</td>
</tr>
<tr>
<td>Ultradent</td>
<td>Viscostat Clear</td>
<td>Hemostatic agent</td>
<td>Aluminum chloride</td>
</tr>
<tr>
<td>Dentsply Caulk</td>
<td>Jeltrate – Both Regular and Fast set</td>
<td>Impression Material</td>
<td>Irreversible Hydrocolloid</td>
</tr>
<tr>
<td>3M/ESPE</td>
<td>Impergum F</td>
<td>Impression Material (To be available by instructor request)</td>
<td>Polyether</td>
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<tr>
<td>Kerr</td>
<td>Extrude</td>
<td>Impression Material</td>
<td>PVS</td>
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<td>Coltene-Whaledent</td>
<td>Coltena Lab Putty</td>
<td>Impression putty</td>
<td>PVS putty</td>
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<tr>
<td>Schein</td>
<td>Dri-angle</td>
<td>Isolation aids</td>
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<tr>
<td>GC America</td>
<td>GC pattern resin</td>
<td>Pattern resin</td>
<td>Acrylic</td>
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<tr>
<td>Scheu-Dental</td>
<td>Copyplast 0.5 x 125 mm</td>
<td>Plastic splint material</td>
<td>Provisional restoration vacu-formed matrix</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Material/Technique</td>
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<td></td>
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<tr>
<td>--------------</td>
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<tr>
<td>Reliance</td>
<td>Duralay post</td>
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<tr>
<td>Dentsply/Caulk</td>
<td>Integrity</td>
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<tr>
<td>3M/ESPE</td>
<td>Ion Iso-form crowns</td>
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<td>3M/ESPE</td>
<td>Ion Polycarbonate crowns</td>
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<td>GC America</td>
<td>Fuji II LC</td>
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<tr>
<td>Schein</td>
<td>Periphery wax (Surgident)</td>
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</tr>
<tr>
<td>Taub</td>
<td>Minute Stain</td>
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<tr>
<td>Ultradent</td>
<td>Ultrapak (sizes 000 through 2)</td>
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</tr>
<tr>
<td>Whip Mix</td>
<td>Silkey-Rock</td>
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<td>Whip Mix</td>
<td>Microstone</td>
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<td>Whip Mix</td>
<td>Mounting stone</td>
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<td>Whip Mix</td>
<td>SnapStone</td>
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<tr>
<td>Whip Mix</td>
<td>Articulator</td>
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<tr>
<td>Vident</td>
<td>Vita Classical</td>
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<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Technique</th>
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<tbody>
<tr>
<td>Coltene/Whaledent</td>
<td>Para-post XP Casting Technique P781 Schein #888-3304</td>
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<tr>
<td>Coltene/Whaledent</td>
<td>Para-post XP stainless steel P780 Schein #888-2818</td>
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<td>Post systems – indirect technique</td>
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<td>Custom - parallel sided</td>
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<td>Post systems – pre-fab</td>
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<td></td>
<td>One visit</td>
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<tr>
<td>Dentsply/Caulk</td>
<td>Provisional composite</td>
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<tr>
<td>Zenith</td>
<td>Provisional composite</td>
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<tr>
<td>3M/ESPE</td>
<td>Temporary crown forms</td>
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<td>Tooth-colored restorative material</td>
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<td>Schein</td>
<td>Wax</td>
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<td>For characterization of provisional restorations</td>
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<td>Ultradent</td>
<td>Retraction cord</td>
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<td>Articulator</td>
</tr>
<tr>
<td>Vident</td>
<td>Shade guide</td>
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</tbody>
</table>

**NOTE** – non-impregnated braided cotton cord should NOT be stock