



**University of Kentucky  
College of Dentistry**

**STANDARDS**

**OF**

**CARE**

August 2004

<b>Table of Contents</b>
--------------------------

**Prevention/Comprehensive Care**

Periodic Recall Examination.....	5
Treatment Evaluation.....	5

**Oral Diagnosis/Oral Medicine**

Data Collection .....	6
Treatment Plan .....	7
Emergency Exam .....	7
Oral Radiology.....	7

**Periodontology**

Examination .....	10
Gingivitis.....	10
Adult Periodontitis.....	11
Early Onset and Refractory Periodontitis .....	13
Mucogingival Conditions.....	13
Supportive Periodontal Treatment (SPT).....	14
Crown Lengthening .....	14
Endosseous Implants.....	15

**Pediatric Dentistry**

Clinical Examination .....	17
Radiographic Examination.....	18
Oral Prophylaxis .....	18
Tropical Fluorides.....	19
Sealant Application.....	19
Preventive Resin Restoration.....	19
Rubber Dam Application .....	20
Amalgam Restoration .....	20
Composite Resin Restoration/Glass.....	20
Stainless Steel Crown .....	21
Labial Veneer (Plastic/Porcelain) .....	21
Direct Pulp Therapy .....	22
Indirect Pulp Therapy .....	22
Pulpotomy .....	23
Pulpectomy (Primary Tooth Root Canal Therapy).....	23
Primary Tooth Extraction .....	23
Ectopic Eruption Correction Therapy .....	24
Space Maintainer Therapy .....	24
Habit Appliance Therapy .....	24
Crossbite Correction Therapy .....	25
Prosthetic Appliance Therapy.....	25
Treatment Planning.....	26

## **Endodontics**

Definition of Endodontics.....	27
Endodontic Examination and Diagnosis.....	27
Endodontic Treatment Planning, Records and Recalls.....	27
Vital Pulp Treatment Procedures.....	28
• Protective Base.....	28
• Indirect Pulp Capping.....	28
• Direct Pulp Capping.....	29
• Pulpotomy.....	29
Nonsurgical Endodontic Procedures.....	30
• Root Canal Therapy.....	30
• Endodontic Retreatment.....	30
• Apexification.....	31
Surgical Endodontic Procedures.....	32
• Incision and Drainage - Soft Tissue.....	32
• Incision and Drainage - Soft and Hard Tissue.....	32
• Periradicular Curettage.....	32
• Apicoectomy.....	33
• Retrofilling.....	33
• Biopsy.....	34
• Hemisection and Bisection.....	34
• Root Amputation.....	35
• Replantation of Avulsed Teeth.....	36
• Replantation or Transplantation: Intentional.....	37
Bleaching Procedures.....	37
• Internal Bleaching.....	37
• External Bleaching.....	38

## **Restorative Dentistry**

Pit and Fissure Sealants.....	39
Preventive Resin Restoration.....	39
Dental Amalgam.....	40
Composite Resin (Direct Placement).....	40
Glass Ionomer.....	41
Cast Gold Inlay.....	42
Indirect Composite Resin Inlay/Onlay.....	42
Porcelain Inlay/Onlay.....	43
Porcelain Veneer.....	44
Partial Crown Coverage - All Metal (Cast Onlay, 3/4 Crown, 7/8 Crown).....	44
Full Crown Coverage (All Metal).....	45
Full Crown Coverage (Porcelain Fused to Metal).....	45
Full Crown Coverage (All Porcelain).....	46
Implant Supported Crowns.....	47

Amalgam/Composite Resin Core Build-up Restoration.....	47
Post Restoration .....	48
Post/Core Cast Metal Restoration.....	48
Non-Metallic Post Restoration.....	49
Etched Metal Retainers .....	50
Vital Tooth Whitening.....	50
Fixed Partial Denture .....	51

**Removable Prosthodontics**

Complete Dentures.....	52
Implant Retained Mandibular Complete Denture.....	52
Removable Partial Dentures .....	53
Intermediate Denture .....	53
Prosthodontic Recall Examination.....	53
Reline .....	54
Rebase.....	54

**Orthodontics**

Clinical Examination .....	55
Radiographic Procedures .....	55
Analysis of Diagnostic, Hand-held Study Casts.....	56
Treatment Planning Procedures .....	56
Treatment Procedures for Limited Orthodontic Therapy .....	57
Anterior Alignment.....	57
Molar Uprighting .....	58
Forced Eruption Procedures for Crown Lengthening.....	58
Space Regaining.....	59
Non-skeletal Crossbite Correction.....	59

**Oral and Maxillofacial Surgery**

Extraction of an Erupted Tooth.....	61
Treatment of Odontogenic Infections, Including Incision and Drainage .....	61
Modifications of the Dentoalveolar Process.....	62
Presurgical Evaluation .....	63
Conscious Sedation, using Parenteral Agents, N <sub>2</sub> O, and/or Oral Medications .....	63
Endosseous Implants.....	64

**Oral Pathology**

Soft Tissue Examination.....	66
Radiographic Examination.....	66
Soft Tissue and Radiographic Alterations and Abnormalities.....	66
Tissue Management .....	66

## PREVENTION/COMPREHENSIVE CARE

Preventive strategies are part of all patient care at the University of Kentucky College of Dentistry. Formal prevention includes Oral Hygiene Instructions, Topical Fluoride (when indicated), and Debridement during the Initial Oral Examination. Instruction for proper home care is provided for patients when treatment is planned, during treatment, and at periodic recall examinations. Patients receiving orthodontic treatment, fixed partial dentures, removable prosthodontics, periodontal treatment, and any other dental treatment are provided instructions for cleaning and maintaining their oral health before, during and after treatment.

Periodic recall examinations are scheduled for patients to evaluate hard and soft tissue and reinforce home care. Treatment evaluation is performed at the end of active treatment to evaluate the dental care provided for the patient and work with patients who require additional instruction in prevention.

### **PERIODIC RECALL EXAMINATION**

The periodic recall examination is provided at appropriate intervals to assist patients in maintaining their oral health. Hard and soft tissues are evaluated and recommendations for treatment are made.

#### **Indications**

All patients who request follow-up care.

#### **Contraindications**

None

#### **Outcomes Assessment**

1. All hard and soft tissues are examined and pathology is noted.
2. Home care and appropriate preventive techniques are reinforced or introduced.
3. Appropriate recall interval is established and completed.
4. Patient's oral hygiene is adequate; periodontium and dentition are healthy.

### **TREATMENT EVALUATION**

The treatment evaluation is done at the completion of treatment to assess the care that has been provided and make improvements if needed. Prevention is evaluated and reinforced if necessary at this time.

#### **Indications**

All patients who have completed treatment.

#### **Contraindications**

None

#### **Outcomes Assessment**

1. All dental care provided for the patient is clinically acceptable.
2. Oral hygiene and periodontal condition are satisfactory.
3. Oral hygiene is reinforced, if needed, and appropriate recall interval is established.

## ORAL DIAGNOSIS/ORAL MEDICINE

Oral Diagnosis is that aspect of dentistry that involves collection and interpretation of pertinent data essential to diagnosing oral disease. Oral Medicine is concerned with the oral health care of medically compromised patients and with the diagnosis and non-surgical management of medically-related diseases or conditions affecting the oral and maxillofacial region.

The predoctoral oral diagnosis/oral medicine curriculum is designed to educate the dental student to:

1. Gather and organize the necessary information to provide comprehensive and accurate oral health care for the patient;
2. be competent at collecting and recording a medical history;
3. be competent at eliciting and recording a complete dental history;
4. be competent at taking, recording and interpreting vital signs (blood pressure, temperature, pulse, respiration);
5. understand the clinical signs and symptoms of major diseases of each organ system;
6. understand the impact of diseases of various organ systems on the oral cavity and on the delivery of dental care;
7. be competent to perform a head and neck examination, including extraoral soft tissues and intraoral hard and soft tissue;
8. understand the anatomic and biologic bases of the head and neck examination;
9. understand the potential impact of dental therapy on systemic disease;
10. understand performance of a musculoskeletal examination including TMJ function;
11. be competent in the assessment of a functional relationship of the teeth and jaws;
12. diagnose and deliver appropriate care in urgent dental situations;
13. take and accurately interpret diagnostic radiographs;
14. be familiar with the procedures necessary to interact with physicians and other health care providers in total patient evaluation and care; and
15. work with the patient in understanding and supporting personal oral health care.

### **DATA COLLECTION**

Comprehensive data is to be collected on all patients in the student clinic in order to secure an accurate diagnosis and to plan for appropriate oral health care for the patient.

### **Indications**

All patients presenting for care in the student clinic.

### **Contraindications**

None

### **Outcomes Assessment**

1. Medical history is evaluated and all aspects of the patient's health that may impact on the delivery of oral health care are identified.
2. All dental disease is identified through a hard tissue and soft tissue examination.
3. Vital signs are accurately taken and recorded on all patients.
4. Appropriate radiographs are available that are diagnostic and current.
5. Consultants are contacted when appropriate and comments recorded in the dental record.
6. All data is recorded in the dental record in a logical sequence on appropriate forms.

## **TREATMENT PLAN**

A treatment plan will be developed for each patient commensurate with their needs and desires.

### **Indications**

All patients requesting care in the student clinic

### **Contraindications**

None

### **Outcomes Assessment**

1. Proposed treatment is based on documentable clinical and/or radiographic findings.
2. Treatment is sequenced in a logical manner including severity of disease, patient desire, difficulty of procedure, etc.
3. Treatment options are discussed with the patient, fees are explained, and informed consent for proposed treatment is obtained.
4. Treatment needs are sequenced according to: (1) preliminary needs (immediate care required); (2) phase I, elimination of disease; (3) phase II, elective treatment including fixed and/or removable prosthodontics, and (4) recall, maintenance therapy.

## **EMERGENCY EXAM**

Patients presenting with urgent needs will receive an emergency exam and treatment necessary to stabilize their condition.

### **Indications**

Patients of record reporting to the student clinic and patients of non-record reporting to the urgent care clinic.

### **Contraindications**

Patients whose needs are determined to be a non-urgent nature by the attending dentist or are too complex for the student dentist.

### **Outcomes Assessment**

1. Patients of record with urgent needs will be evaluated and treated by their student dentist under the supervision of the appropriate discipline.
2. Patients of non-record will be seen in the urgent care clinic, stabilized, and referred to the appropriate source for follow-up care.
3. Patients whose needs are determined to be of a non-urgent nature will be referred to the appropriate source for follow-up care.

## **ORAL RADIOLOGY**

Oral radiology is the area of dental practice that deals with the use of radiation, including diagnostic, therapeutic, and nuclear aspects of clinical practice and research. It is based on physical principles and biologic phenomena and is linked with most branches of dental science. Radiographic examinations are based on the needs of the patient, not the amount of time elapsed since the last exposure, not on a periodic basis, and not for administrative purposes. This is in accordance with the guidelines for prescribing dental radiographs (FDA publication #88-8273).

## **INTRAORAL FILMS**

### **Indications**

Patients requesting oral health care.

**Contraindications**

Diagnostic films taken recently and available, patient is pregnant seeking elective care during first trimester of pregnancy with no clinical evidence of oral disease, or patient is edentulous with a recent panoramic film.

**Outcomes Assessment**

1. Technical ability will be confirmed by a radiographic product that is diagnostic and appropriate to the patient's status.
2. Processing of the films will be performed by the clinician with any processing errors identified and remediated by that clinician.
3. Selection criteria for the radiographic examination are stated and logical.
4. Radiographs are analyzed under the supervision of qualified personnel.
5. Radiographic safety will be demonstrated through appropriate use of shielding devices, accurate exposure dosage, and radiographic records for each patient.

**SUPPLEMENTAL FILMS (EXTRAORAL, PANORAMIC, ETC.)****Indications**

Patients seeking care with specialized needs. Requests for additional radiographs to supplement intraoral films or to replace these films includes, but are not limited to panoramic films on edentulous patients, TMJ series, Water's view, and lateral skull.

**Contraindications**

Information available on intraoral films, diagnostic radiographs available from another source, pregnant individuals seeking elective care during the first trimester.

**Outcomes Assessment**

These films will be ordered, exposed and interpreted under the supervision of qualified personnel.

## PERIODONTOLOGY

"That specialty of dentistry which encompasses the prevention, diagnosis and treatment of diseases of the supporting and surrounding tissues of the teeth or their substitutes; the maintenance of the health, function and esthetics of these structures and tissues; and the replacement of lost teeth and supporting structures by grafting or implantation of natural and synthetic devices and materials" (1).

### **KNOWLEDGE**

While periodontal disease diagnosis and treatment requires special knowledge, practitioners must possess a working knowledge of other disciplines to provide optimum care. Some of these disciplines are:

- physiology
- anatomy
- histology
- microbiology
- immunology
- pathology
- restorative dentistry
- oral medicine
- pharmacology
- systemic disease
- dental implants
- biochemistry
- prosthodontics
- pediatric dentistry
- endodontics
- biomaterials
- laboratory medicine
- critical thinking
- literature analysis
- oral and maxillofacial surgery
- radiology
- oral biology

### **INTRODUCTION**

The goal of periodontics is to maintain or restore health in the periodontium. Arresting or slowing down the disease process may be alternative goals if "health" cannot be achieved. Generally the diseases dealt with are inflammatory and are categorized as gingivitis or periodontitis. The principle causative agents are intraoral microflora which colonize the tooth surface both supragingivally and subgingivally as well as the subgingival pocket area.

Transition of gingivitis to periodontitis does not always occur, although periodontitis is always preceded by gingivitis. Since the structures and microflora involved in gingivitis and periodontitis are different, treatment methodologies and outcomes will vary depending on the disease. Elimination of the bacteria present in gingivitis can lead to a complete reversal of the disease. Treatment of periodontitis always requires elimination of microflora but the periodontium will not return to its pre-diseased state.

The general practitioner should be able to diagnose health and disease, treatment plan, remove plaque, treat gingivitis, and manage periodontitis. Management may include nonsurgical treatment of early disease and working with a periodontist on a referral basis for treatment of all forms of periodontitis. The general practitioner should be well versed in multiple methods of patient control of oral microflora.

## **EXAMINATION**

1. A thorough medical history should be taken on each patient. Various systemic diseases, conditions, and habits such as diabetes, hypertension, smoking and pregnancy can influence periodontal conditions and treatment. A complete list of all patient medications should be recorded, and their actions and interactions with drugs to be prescribed should be evaluated. Consultations with other health care professions should be obtained as needed.
2. A dental history should be obtained and any previous records and radiographs should be added to the current file. Contacts with previous dental practitioners may provide valuable information.
3. A head and neck extraoral examination should be performed. Abnormalities should be noted and appropriate referrals performed if necessary.
4. An intraoral examination of oral mucosa, tongue, floor of mouth, lips, palate, oropharynx, glands, and alveolus should be performed. Palpation should be utilized as required. All abnormalities should be noted and consultations obtained as needed.
5. Individual teeth, replacements, occlusion, caries, tooth position, pulpal status (as needed), restorations, and mobility should be noted. Diagnostic casts should be obtained.
6. Appropriate radiographs should be taken. A panoramic film and bite-wing radiographs are sufficient for analysis of the periodontium of a patient with gingivitis. Full mouth radiographs are required for patients with periodontitis.
7. The presence of plaque and calculus should be recorded.
8. The gingival and alveolar mucosa should be examined. Consistency, color and frenum insertions, probing depths, bleeding points, recession and furcation involvement should be recorded. The quantity of attached gingival should be noted.
9. Laboratory tests and additional radiographs should be obtained if needed.
10. Data should be analyzed and a diagnosis, treatment plan and prognosis formulated.

## **GINGIVITIS**

Gingivitis is inflammation of the gingival by oral microflora (plaque) without attachment loss. Some or all of the following clinical findings may be present:

- erythema
- bleeding on probing
- contour alteration
- consistency alteration
- presence of calculus

- presence of plaque
- edema

Tooth position and existing restorative dentistry can be secondary contributing disease factors.

### **Treatment Goals**

Return the gingival tissue to health by eliminating plaque, calculus and secondary contributing factors.

### **Methodology**

1. Education of the patient as to the causative disease factors (microflora), disease effects and characteristics.
2. Oral hygiene education, demonstration and evaluation.
3. Removal of microbial plaque, calculus and stain. This is typically performed by hand and/or ultrasonic instrumentation (scaling) and application of abrasive pastes.
4. Correction of secondary restorative factors. Examples may include:
  - overhanging margins
  - open margins
  - improperly contoured restorations
  - primary caries
  - secondary caries
  - open contacts
  - fractured restorations
5. Correction of tooth malposition if possible.
6. Reexamination.

### **Outcomes Assessment**

1. Elimination or reduction of plaque, calculus, stain, edema, erythema and bleeding on probing should be evidenced if satisfactory treatment was rendered and patient oral hygiene was satisfactory. Gingival health should be present if these conditions exist.
2. If treatment is unsuccessful, additional instrumentation may be required and/or a change in frequency of instrumentation. A review of plaque control procedures with the patient as well as alternative plaque control measures may be required.

### **ADULT PERIODONTITIS**

"Periodontitis is inflammation of the supporting tissues of the teeth. It is usually a progressively destructive change leading to loss of bone and periodontal ligament or an extension of inflammation from gingival into the adjacent bone and ligament. Adult periodontitis usually has an onset beyond age 35. Bone resorption usually progresses slowly and predominantly in the horizontal direction. Well-known local environmental factors are prominent and abnormalities in host defense have not been found" (1). Clinical features may include some or all of the following:

- edema
- erythema
- bleeding on probing
- suppuration
- bone loss (early to moderate up to 1/3, advanced > 6 mm)
- furcation involvement (early to moderate-Class I, advanced-Class II or III)
- tooth mobility
- radiographic evidence of bone loss
- probing depths (early to moderate up to 6 mm, advanced > 6 mm)

- attachment loss (early to moderate up to 5 mm, advanced > 5 mm)
- localized or generalized presentation
- early, moderate and or advanced stages

### **Treatment Goals**

Eliminate arrest or slow down the disease by the elimination and/or alteration of the oral microflora and secondary factors. Preservation of a healthy, comfortable, functional and esthetic dentition is the goal for each patient.

### **Methodology**

1. Evaluate contributing factors such as smoking, diabetes, medications, and pregnancy. Eliminate as many contributing factors as possible.
2. Education of the patient as to the causative disease factors (microflora), disease effects and characteristics.
3. Oral hygiene education, demonstration and evaluation.
4. Removal of microbial plaque, calculus and stain (supragingivally and subgingivally). Typically performed by hand and/or ultrasonic instrumentation (scaling and root planning).
5. Local delivery of antimicrobials may be utilized secondarily.
6. Systemic delivery of antibiotics may be utilized secondarily.
7. Correction of secondary restorative factors such as:
  - overhanging margins
  - open margins
  - improperly contoured restorations
  - primary caries
  - secondary caries
  - open contacts
  - fractured restorations
8. Correction of other secondary factors such as:
  - poor prosthetic appliances
  - trauma from occlusion
  - tooth malposition
9. An appropriate time interval should be observed to allow for inflammation resolution and repair. A thorough periodontal reexamination should be performed including gingival characteristics, probing, and bleeding points. Evaluation of the patient should be performed and their disease status determined.
10. If periodontal therapy has resolved the periodontal disease, supportive periodontal treatment (SPT) should be initiated.
11. If periodontal therapy has not resolved the periodontal disease, further nonsurgical or surgical therapy should be performed as deemed appropriate.
12. Reexamination as deemed appropriate.

### **Surgery**

1. The appropriate surgical modality will be determined by a periodontal faculty member, periodontal resident and the dental student.
2. Surgical treatment will be performed by a periodontal resident in conjunction with a dental student under the supervision of the periodontal faculty.
3. Reexamination as deemed appropriate.

### **Outcomes Assessment**

1. Elimination or reduction of plaque, calculus, stain, edema, erythema, probing depths, and bleeding points if satisfactory treatment was rendered. Stabilization or gain of clinical attachment should also be evident during the clinical reexamination. Improvement may be seen in radiographic appearance.
2. Alteration of occlusal forces.
3. Effective patient oral hygiene.
4. Unresolved areas of periodontal disease may occur and be characterized by:
  - inflammation
  - increased probing depths
  - continued attachment loss
  - persistent bleeding on probing
  - persistent plaque deposition
5. Patient response is variable and treatment modalities may require modification or alteration as needed.

### **EARLY ONSET AND REFRACTORY PERIODONTITIS**

These disease entities will receive treatment by periodontal residents and/or faculty.

### **MUCOGINGIVAL CONDITIONS**

Mucogingival conditions are alterations of the normal relationship between the free gingival margin and the mucogingival junction. Alterations of morphology position and quantity of gingival may be present (1). Clinical features may include:

- recession
- lack of or reduction in keratinized tissue
- lack or reduction in attached gingiva
- probing depths which traverse the mucogingival junction
- ridge defects

### **Treatment Goals**

Decrease or eliminate root sensitivity, correct esthetic problems, eliminate pocketing and control or eliminate inflammation.

### **Methodology**

Surgical procedures will be performed by a periodontal resident in conjunction with a dental student under the supervision of the periodontal faculty.

1. Eliminate or control inflammation through plaque control by improved oral hygiene and scaling and root planing.
2. Root desensitization.
3. Gingival grafting.
4. Root coverage (soft tissue).
5. Correction of trauma from occlusion.
6. Frenectomy or frenotomy.
7. Correction of tooth malposition.
8. Surgical procedures for probing depth reduction.
9. Surgical procedures for ridge augmentation.

### **Outcomes Assessment**

1. Clinical signs of inflammation have been eliminated.
2. Esthetics are satisfactory.

3. Areas of recession may have been corrected.
4. Recession is not progressing.
5. Mucogingival defects have been corrected.
6. Successful treatment may not have occurred due to persistent inflammation or the persistence of mucogingival defects. Satisfactory results are not possible in all patients.

### **SUPPORTIVE PERIODONTAL TREATMENT (SPT)**

SPT is an extension of periodontal therapy. Procedures are performed at selected intervals to assist the periodontal patient in maintaining oral health. These usually consist of an examination, evaluation of oral hygiene, scaling, root planing and supragingival plaque removal with abrasive pastes (1).

#### **Treatment Goals**

Prevent or minimize the recurrence and/or progression of periodontal disease by continual evaluation of the patient. Return the patient to active therapy if their diseases status warrants it.

#### **Methodology**

1. Examination (refer to examination section).
2. Determine disease status.
3. Determine oral hygiene status.
4. Remove local factors (as needed).
5. Review oral hygiene (as needed).
6. Determine if the patient must return to active therapy status or may remain under SPT.
7. If the patient must return to active treatment status, modify the treatment as needed.
8. If the patient remains under SPT, an appropriate time interval must be established between appointments.

#### **Outcomes Assessment**

1. Periodontal health is maintained.
2. SPT may be unsuccessful if patient oral hygiene is inadequate, compliance is poor or recurrence of disease is observed. These conditions may alter the patient treatment plan.

### **CROWN LENGTHENING**

Periodontal surgical procedures involving the soft and/or hard tissues to permit tooth restoration. Some or all of the following may be indications:

- tooth fracture (crown and/or root)
- extensive primary caries
- extensive secondary caries
- endodontic perforation
- inadequate crown length for adequate preparation
- iatrogenic dentistry
- post-orthodontic extrusion

#### **Treatment Goals**

Provide adequate crown length, and maintain proper crown to root ratio while preserving the biologic width.

#### **Methodology**

1. Determination of need will be made by the periodontal and restorative faculty in conjunction with the periodontal resident and dental student.

2. Resective soft and/or hard tissue surgery.
3. Surgical treatment will be performed by a periodontal resident in conjunction with a dental student under the supervision of the periodontal faculty.
4. Determine patient oral hygiene.

#### **Outcomes Assessment**

1. Post-operative crown length adequate for required post-surgical procedures.
2. Adequate patient oral hygiene.
3. Unfavorable results can be evidenced due to inadequate tissue resection, poor oral hygiene, inadequate crown to root ratio, and fractures requiring tooth extraction.

#### **ENDOSSEOUS IMPLANTS**

Replacement of (a) teeth (tooth) with (a) machined root form shaped titanium alloy to improve function and/or esthetics. The following may be indications for placement:

1. tooth and/or root fracture
2. missing teeth due to trauma
3. previous extraction sites
4. spaces created by orthodontic movement
5. endodontic failures
6. restorative failures
7. extractions due to periodontal disease
8. non-restorable teeth due to caries (following extraction)
9. to avoid preparation of virgin teeth for bridge abutments
10. anchorage for orthodontic tooth movement

#### **Treatment Goals**

Provide the patient with 1) replacement function and/or esthetics in edentulous areas of the mandible and/or maxilla or 2) anchorage for orthodontic tooth movement.

#### **Methodology**

1. The determination of the appropriate treatment will be determined by clinical faculty in the appropriate disciplines which would generally be periodontics, restorative dentistry, prosthodontics, and orthodontics. The Implant Consent and Treatment Planning Form (5D) and financial arrangements must be completed before treatment begins.
2. The supervising periodontal resident and the dental student will be involved in the treatment plan.
3. Appropriate faculty, the periodontal resident, and the dental student will explain the treatment plan to the patient.
4. Existing periodontal disease in the dentition must be resolved prior to implant placement.
5. A plaque score of 25% must be achieved prior to implant placement.
6. Implant placement will be performed by the periodontal resident who will be assisted by the dental student assigned to the patient. The procedure will be performed in the periodontal graduate clinic under the supervision of the periodontal faculty.

#### **Outcomes Assessment**

1. The implant will be evaluated radiographically for adequate placement (See Radiographic Guidelines for Implant Patients in the Clinic Manual).
2. Following healing (3-6 months) the implant will be evaluated for mobility and probing depth.
3. Patient oral hygiene will be evaluated and corrected as required.

4. Radiolucencies, implant mobility, and increased probing depths are indications that an implant is ailing, failing or has failed and further treatment is required.

**References**

1. Glossary of Periodontal Terms. The American Academy of Periodontology, 1992.

## PEDIATRIC DENTISTRY

Pediatric Dentistry is an age specific dental specialty that encompasses all aspects of dentistry. Since children are unique in their stages of development, oral diseases, and oral health treatment needs, this section will focus on comprehensive preventive and therapeutic oral health care of children. One goal is to provide a basic philosophical and technical foundation for diagnosis, treatment planning, and providing treatment procedures in children. Another goal is to provide practical experience in managing the behaviors of children. The former goal is scientifically more definitive, while the latter goal is less clearly defined. Regarding the practical experience gained through behavior management; it is only expected that the student should clearly document the child's initial behavior and describe uncooperative or inappropriate behaviors. Once strategies for managing the behaviors are implemented it is then expected that the student document effectiveness of the techniques. The goal is to have the management techniques positively affect the child's emotional development. Further, the student should understand that behavior management methods employed are to allow the opportunity for communicating, educating, coping, and cooperating during treatment procedures. In addition to words, it is desired that the student appreciate the impact of voice tone, facial expression and gestures. The more definitive pediatric dentistry treatments follow:

### **CLINICAL EXAMINATION**

This consists of a health history review and a physical assessment.

#### **Indications**

1. All patients of record should receive a thorough examination of the intra- and extra-oral soft tissues, and intraoral hard tissue examination, and a review of the health history.

#### **Contraindications**

There are no contraindications for the clinical examination.

#### **Outcomes Assessment**

1. Health history should be reviewed and summarized:
  - a. Medical history summarized and ASA status determined and marked on the medical history questionnaire. Allergies should be clearly identified with red highlighting. Need for SBE prophylaxis should be documented. Medications the child is taking should also be documented.
  - b. Dental history should be reviewed so that the reason for seeking care is documented. Previous dental treatment with comments about the child's behavior during that treatment should be documented. Oral habits and previous dental injuries should be reviewed and documented.
  - c. Home Dental Care: An assessment of the child's fluoride status, oral hygiene habits, and dietary practices should be recorded. The need for fluoride supplementation should be established.
  - d. Behavior History: A prediction of how the child will behave should be made. Information regarding how the child behaved on previous dental appointments or for medical appointments should be ascertained.
2. The physical assessment should survey the following:
  - a. General appraisal of the face, neck, lips, gingivae, buccal mucosa, palate, tongue, and tonsillar area should be documented if not within normal limits.

- b. The presence of teeth should be circled clearly on the pediatric evaluation form. Occlusion should be recorded, with data reflecting the anterior-posterior, traverse, and vertical planes of space.
- c. Anomalies in number, size, shape, texture, eruption, exfoliation, and tooth position should be documented. All dental restorations and carious lesions should be charted by tooth number and surface.
- d. History of traumatic injuries and oral habits should be documented to identify teeth affected, description of how injured, duration of habit, and date of injury.

## **RADIOGRAPHIC EXAMINATION**

### **Indications**

All patients of record should receive an assessment of dental caries, periodontal status, developmental status, pathologic disturbances, swelling and pain or dysfunction.

All radiographs will be ordered based on the guidelines set forth by the American Academy of Pediatric Dentistry (AAPD) and as published reference manual indicates in the "Pediatric Dentistry Journal." (FDA publication #88-8273)

### **Contraindications**

Patients in the first trimester of pregnancy seeking elective care. Radiographs will only be ordered according to the guidelines of the AAPD.

### **Outcomes Assessment**

1. All radiographs are of diagnostic quality to permit assessment of health and development of the dentition and oral structures. They are to supplement the clinical examination findings.
2. Pathologic interpretations should also be documented on the pediatric evaluation form and/or in the progress notes. This includes eruption interferences, abscesses, and congenitally missing teeth.
3. A radiographic record should document films ordered and the number of exposures made.

## **ORAL PROPHYLAXIS**

Traditionally this has been the polishing of teeth with a rubber cup; however, the toothbrush is an acceptable instrument for completing this procedure. Dental floss is also an adjunct for intraproximal portion of the prophylaxis. Scaling is done if calculus is present.

### **Indications**

1. Removal of plaque, calculus, and/or extrinsic stains from the teeth.
2. Polishing the teeth.
3. Education of the child and/or caregiver.

### **Contraindications**

1. Patients who are susceptible to subacute bacterial endocarditis need to be managed with the appropriate antibiotic therapy according to current AHA guidelines.
2. Patients who suffer with a bleeding disorder need to be managed with the appropriate precautions if bleeding is likely for this procedure.

### **Outcomes Assessment**

1. All plaque should be removed from the crowns of all tooth surfaces.
2. Extrinsic stains and calculus should be removed and the teeth should be polished.

3. Child should be given instructions on plaque removal and should minimally demonstrate with a toothbrush. As coordination improves, flossing instructions should be implemented.
4. A recall plan should be established and documented.

## **TOPICAL FLUORIDES**

### **Indications**

Caries susceptible children as demonstrated by enamel decalcifications or clinically diagnosed caries. Systemic fluoride supplementation schedule is attached.

### **Contraindications**

1. Children who do not understand or who are unable to prevent swallowing the fluoride products.
2. Children who are a low caries risk (caries free, excellent oral hygiene, and open contacts).

### **Outcomes Assessment**

1. Fluoride application is retained in child's mouth for one to four minutes.
2. Child does not eat or drink for the next 30 minutes.

## **SEALANT APPLICATION**

### **Indications**

1. Deep, retentive pits and fissures that may cause wedging or catching of an explorer.
2. History of previous occlusal caries.
3. Tooth erupted within the last 4-5 years.
4. Can be placed on primary or permanent molars, premolars, and the cingula of maxillary incisors with deep pits and/or fissures.

### **Contraindications**

1. Well coalesced, self cleaning pits and fissures.
2. Patients with interproximal lesions on a tooth that is planned for a sealant or occlusal caries.
3. Inability to keep tooth contained with dry isolation.

### **Outcomes Assessment**

1. Sealant is intact and covers all susceptible pits and fissures.
2. Occlusion is evenly distributed as before placement of the sealant.
3. No evidence of caries development.

## **PREVENTIVE RESIN RESTORATION**

### **Indications**

1. Deep pits and fissures in primary and permanent teeth that contain questionable caries areas.
2. Implicit carious lesions.
3. Well confined carious lesions.
4. Enamel defects.

### **Contraindications**

1. Interproximal caries on suspect tooth.
2. Need to extend preparation beyond the suspect pit and/or fissure.

**Outcomes Assessment**

1. Restoration is intact and covering all involved and/or susceptible pits and fissures.
2. Normal occlusal relationship is maintained.
3. No evidence of caries development beneath or around the margins of the restoration.

**RUBBER DAM APPLICATION****Indications**

1. Restorative or endodontic procedures for primary or permanent teeth.
2. Protect soft tissues and improve patient management.
3. Prevent dental instruments and other materials from entering the oropharynx.

**Contraindications**

1. Orthodontic bands on teeth.
2. Patients with poor nasal exchange.
3. Patients with allergy to latex.
4. Clamp cannot be retained due to state of eruption of the tooth.

**Outcomes Assessment**

1. Rubber dam does not block the nose for air exchange.
2. Rubber dam barrier remains intact through procedures, does not become dislodged, and isolates teeth to be treated.
3. All stabilizing ligatures and rubber dam material is removed upon completion of restorative procedures.

**AMALGAM RESTORATION****Indications**

1. The restoration of dental caries.
2. The restoration of developmental defects.

**Contraindications**

1. First primary molar with mesial caries.
2. Interproximal caries that goes beyond the buccal angle.
3. Caries greater than 1/3 the isthmus of the occlusal portion of the amalgam preparation in primary molars.

**Outcomes Assessment**

1. Vitality of the tooth is maintained.
2. Developmental form and function are restored and the restoration remains intact.
3. Margins of the restoration do not compromise gingival health or prevent adequate oral hygiene.

**COMPOSITE RESIN RESTORATION****Indications**

1. Restoration of one or more surfaces on anterior teeth due to fracture, caries, or developmental defects.
2. Restoration of ideal one surface (Class I or Class V) caries or developmental defects on posterior teeth.
3. Restoration of small Class II carious lesions.

**Contraindications**

1. Large Class II restoration to restore interproximal caries in posterior teeth.
2. Inability to keep a dry field with rubber dam or cotton products, if manufacturer's directions describe dry teeth.

**Outcomes Assessment**

1. The vitality of the tooth is maintained.
2. Developmental form and function are restored and the restoration is intact.
3. Shade of the restorative material approximates that of the patients natural tooth structure.
4. Restoration is approximately finished and the margins are even with natural tooth structure.
5. Margins of the restoration do not compromise gingival health or prevent adequate oral hygiene.

**STAINLESS STEEL CROWN****Indications**

1. Restoration of first primary molar with mesial surface caries.
2. Restoration when failure of other available restorative materials is likely.
3. Restoration of primary or permanent teeth with extensive caries.
4. Restoration following pulpotomy or pulpectomy (root canal therapy) for primary and permanent teeth.
5. Restoration for hypoplastic or hypocalcified teeth and teeth with hereditary anomalies.
6. Restoration for a tooth to be used as an abutment for fixed appliances.
7. Restoration as temporary for fractured teeth or for permanent molars with extensive caries.

**Contraindications**

Not enough space to place an adequately fitting crown.

**Outcomes Assessment**

1. Adequate caries removal and/or pulp treatment is completed and tooth is reduced for the crown.
2. Crown is appropriately trimmed, adapted, smoothed, and polished.
3. Appropriate sized crown that maintains arch length.
4. Adequate marginal adaptation for gingival health and excess cement is removed.
5. Functional occlusion is restored.
6. Tooth vitality is maintained when possible.
7. Restoration enables patient to maintain oral hygiene.
8. Restoration does not interfere with tooth eruption.

**LABIAL VENEER (PLASTIC/PORCELAIN)****Indications**

1. Esthetic restoration for anterior teeth that need to be restored or are deeply stained or discolored.
2. Conservative restoration for preventing full coverage restorations of fractured permanent incisors.

**Contraindications**

1. Occlusal disharmonies that could cause restoration failure.

2. Patients with disorders such as esophageal reflux or bulimia that could cause luting agents to fail.

#### **Outcomes Assessment**

1. Restore form and esthetics.
2. Maintain vitality of the tooth restored.
3. Margins of the restoration do not compromise gingival health or prevent adequate oral hygiene.

### **DIRECT PULP THERAPY**

#### **Indications**

1. Minimal pulp exposure during caries removal on a permanent tooth.
2. Therapy for permanent tooth that sustains a mechanical exposure during preparation or that has a traumatic exposure such as in the case of a fracture.

#### **Contraindications**

1. Primary teeth.
2. Greater than minimal pulp exposure (gross exposure).
3. Radiographic periapical radiolucency; signs and symptoms indicate irreversible pulpitis.

#### **Outcomes Assessment**

1. Hemorrhage is controlled and calcium hydroxide is placed over the exposed pulp.
2. Preparation is sealed with an appropriate restorative material.
3. Vitality of the tooth is maintained and no prolonged adverse clinical signs and symptoms are evident (pain, swelling).
4. Developmental evidence of tertiary dentin formation occurs.
5. No evidence of pathology such as internal resorption, abnormal calcification.

### **INDIRECT PULP THERAPY**

#### **Indications**

A tooth that has caries approaching the pulp. Placing a protective dressing over a layer of remaining dentin protects against pulpal injury and stimulates healing.

#### **Contraindications**

1. Radiographic periapical radiolucency indicating a pathologic condition.
2. Signs and symptoms indicate irreversible pulpitis.

#### **Outcomes Assessment**

1. An appropriate base is placed over the remaining carious dentin.
2. The preparation is sealed with an appropriate restorative material.
3. The vitality of the tooth is maintained and no prolonged adverse clinical signs and symptoms are evident.
4. Developmental evidence of tertiary dentin formation occurs.
5. No evidence of pathology such as internal resorption, abnormal calcification, or periradicular radiolucency.

## **PULPOTOMY**

### **Indications**

1. Carious or mechanical exposures in primary molars with vital pulps.
2. Permanent teeth when the pulp is exposed and is vital.
3. Permanent teeth as urgent treatment in preparation for conventional root canal therapy.

### **Contraindications**

1. Inability to control hemorrhage upon removing infected or affected canal pulp tissues.
2. Periapical radiolucency in suspect primary molar.
3. Clinical signs and symptoms of irreversible pulpitis or abscess for primary molar.

### **Outcomes Assessment**

1. Appropriate selection and use of pulp therapy medicament.
2. Radicular pulp vitality is maintained and no prolonged adverse clinical signs and symptoms are evident.
3. No pathology such as internal resorption, abnormal calcification, or periradicular radiolucency.
4. Normal root apical closure and root length occurs.

## **PULPECTOMY (PRIMARY TOOTH ROOT CANAL THERAPY)**

### **Indications**

1. Primary incisors traumatized with consequent pathology.
2. Non vital permanent teeth with immature roots.
3. Non vital primary molars.
4. Primary molars that sustain hemorrhage upon attempting pulpotomy procedures.

### **Contraindications**

1. Facial swelling associated with non vital primary molar.
2. Tooth is not restorable.
3. Pathology extends to developing permanent teeth.
4. Internal or external resorption in crown and root.
5. Less than 2/3 of the primary tooth root structure remains.
6. Treatment could cause untoward sequela for medically compromised patient.

### **Outcomes Assessment**

1. Evidence of a successful root canal filling with the appropriate material (no gross overextension or underfilling of canal).
2. Radiographic observation reveals root end closure (apexification).
3. No prolonged adverse clinical signs and symptoms.
4. No radiographic evidence of internal/external resorption.
5. No exacerbation of previous periradicular radiolucency or development of periradicular radiolucency where none existed.

## **PRIMARY TOOTH EXTRACTION**

### **Indications**

1. Acute or chronic pathology associated with primary teeth.
2. Over-retained teeth.
3. Cariously involved, non-restorable tooth.

4. Natal/neonatal teeth that are mobile and subject to aspiration, are a source of ulceration, or interferes with feeding.
5. Supernumerary teeth.
6. Fractured or traumatized non-restorable teeth.

**Contraindications**

1. Acute oral infection such as herpetic stomatitis or necrotizing ulcerative gingivitis.
2. Procedure could cause untoward sequela for patients who are medically compromised.

**Outcomes Assessment**

1. Appropriate anesthesia is obtained and the correct tooth is extracted.
2. Alveolus remains intact.
3. Hemorrhage is managed.
4. Post extraction instructions (written and oral) are reviewed with the child and/or child's caregiver.
5. Antibiotic therapy is initiated when appropriate.
6. Hospital care is sought when appropriate.

**ECTOPIC ERUPTION CORRECTION THERAPY****Indications**

1. Radiograph reveals that delayed eruption is due to atypical direction of tooth eruption.
2. Delayed eruption is due to impingement by previously placed restoration in an adjacent tooth.

**Contraindications**

Procedure could cause untoward sequela for patients who are medically compromised.

**Outcomes Assessment**

1. Restoration is replaced and allows proper eruption of the ectopically erupting tooth.
2. Appropriate mechanical therapy repositions the ectopically erupting tooth (create enough space) to reascertain the arch length and/or preserve as much space as possible for the developing permanent dentition.

**SPACE MAINTAINER THERAPY****Indications**

Premature loss of teeth where it is necessary to prevent migration of adjacent teeth.

**Contraindications**

1. Procedure could cause untoward sequela for patients who are medically compromised.
2. Patients who are high risk for compliance (home care, care for appliance, and keeping future appointments).

**Outcomes Assessment**

1. Appropriate appliance design is chosen to maintain the space and alignment of teeth.
2. The space present when the appliance is placed continues to be preserved until eruption of the succedaneous tooth.
3. Appliance does not prevent the normal eruption of succedaneous teeth.

## **HABIT APPLIANCE THERAPY**

### **Indications**

Management of a habit that is causing or may cause unfavorable consequences in the permanent dentition and orofacial development.

### **Contraindications**

1. Child cannot understand instructions and the function of the appliance.
2. Patient is high risk for compliance (home care, care for appliance, and keeping future appointments).

### **Outcomes Assessment**

1. Eliminate or decrease the intensity of the habit.
2. Eliminate or decrease the effect of the habit on permanent dentition and orofacial development.

## **CROSSBITE CORRECTION THERAPY**

### **Indications**

1. Anterior and/or posterior non-skeletal crossbites.
2. End to end dental occlusion that demonstrates potential for severe attrition.

### **Contraindications**

Patient is high risk for compliance (home care, care for appliance, and keeping future appointments).

### **Outcomes Assessment**

1. Appropriate appliance design to achieve correction of crossbite and/or improved inter arch relationships.
2. The desired occlusion is maintained.

## **PROSTHETIC APPLIANCE THERAPY**

### **Indications**

1. Caries causing multiple tooth extraction.
2. Trauma resulting in tooth loss.
3. Missing teeth due to congenital/genetic defects.
4. Congenital or genetic disturbances as in dentinogenesis/amelogenesis imperfecta or cleft palate.
5. Facilitation of establishing esthetics, occlusal function, speech development, and/or feeding.

### **Contraindications**

Patient is high risk for compliance (home care, care for appliance, and keeping future appointments).

### **Outcomes Assessment**

1. Facial profile, function, and esthetics are improved.
2. Ability to adequately remove plaque from the natural teeth is facilitated.
3. Appliance has adequate retention.
4. Appliance does not interfere with normal speech development.

5. Appliance allows normal eruption of teeth and does not prevent normal orofacial growth and development.

## **TREATMENT PLANNING**

### **Indications**

All pediatric patients' care must be treatment planned with a CD-12 signed by a faculty member in the section of Pediatric Dentistry.

### **Contraindications**

None

### **Outcomes Assessment**

1. Accurate diagnosis of clinical findings.
2. Appropriate prevention plan is established.
3. Appropriate treatment procedures are planned for each tooth to be treated.
4. Radiographic interpretation confirms the presence of suspected disease/pathology.
5. Informed consent is gained by parent or guardian.

## ENDODONTICS

### **DEFINITION OF ENDODONTICS**

Endodontics is the dental specialty concerned with the morphology, physiology, and pathology of the human dental pulp and periradicular tissues. Its study and practice encompass the basic clinical sciences including normal pulp biology; the etiology, diagnosis, prevention, and treatment of diseases and injuries of the pulp; and associated periradicular conditions.

The scope of endodontics is defined by the educational requirements for the training of a specialist in this discipline. Its scope of endodontics includes but is not limited to the differential diagnosis and treatment of oral pain of pulpal or periradicular origin; vital pulp therapy such as pulp capping and pulpotomy; root canal therapy such as pulpectomy, nonsurgical treatment of root canal systems with or without periradicular pathosis of pulpal origin, and the obturation of these root canal systems; selective surgical removal of pathological tissues resulting from pulpal pathosis; replantation of avulsed teeth; surgical removal of tooth structure such as in apicoectomy, hemisection, and root amputation; endodontic implants; bleaching of discolored dentin and enamel; retreatment of teeth previously treated endodontically; and treatment procedures related to coronal restoration by means of post or cores involving the root canal space.

Dental practitioners must perform endodontic therapy consistent with their educational training and clinical experience. Keeping in mind that dentistry's main goal is for the public to maintain a healthy, natural dentition, every dental practitioner must be able to recognize and effectively treat pulpal injuries and diseases that are common and comply with the skills acquired by graduates of dental schools in the United States. Endodontic cases that are beyond the training, experience, and expertise of individual practitioners should be referred to practitioners who can appropriately provide treatment. All endodontic treatment should be of such quality that predictable and favorable results will routinely occur.

### **ENDODONTIC EXAMINATION AND DIAGNOSIS**

Many features of endodontic evaluation are common to all dental practice.

An adequate medical and dental history with accompanying visual and radiographic examination provides basic information. Appropriate pulpal and periapical tests such as thermal, electrical, percussion, palpation, and mobility should be performed. Additional periodontal examination, transillumination, and bacteriologic testing may be indicated. Pre-operative radiographs may be taken from more than one angle to gain a better perspective of the morphology of the tooth or teeth in question. Bitewing radiographs, occlusal plane films, and radiographs of the contralateral and opposing teeth may also be necessary.

It may be necessary to recall some patients at periodic intervals to compare the examination data from one time interval to another for an accurate diagnosis. At times it is advisable to secure radiographs from previous practitioners or the existing dental record to gain a better understanding of the evolution of the current situation.

### **ENDODONTIC TREATMENT PLANNING, RECORDS AND RECALLS**

Appropriate treatment is predicated on an accurate analysis of all diagnostic data. Treatment planning should include determining the strategic importance of the tooth or teeth considered for treatment, the expectations of the patient, the endodontic prognosis, and other factors such as excessively curved canals, periodontal disease, occlusion tooth fractures, calcified or occluded canals, and teeth with unusual or abnormal canal morphology.

Treatment records should include the chief complaints or patient comments, clinical impression, results of diagnostic tests and clinical examination. Also included are the pulpal and periapical diagnosis, treatment rendered, and required pre-operative, intra-operative, post-operative, and recall radiographs. Records should also include patient commentaries or complaints before and during treatment, or at any subsequent post-operative examination.

Endodontic care also includes the evaluation of the patient's post-operative response to treatment. Endodontic providers should encourage patients to return at intervals appropriate for the procedures undertaken to allow continued clinical evaluation.

### **VITAL PULP TREATMENT PROCEDURES**

Vital pulp treatments attempt to preserve the integrity and function of the pulpal tissue in whole or in part as dictated by the degree of pulpal injury. Materials used in vital pulp therapy, such as calcium hydroxide, should meet the guideline of the ADA Council on Dental Therapeutics. The permanent restoration should be placed as soon as possible.

### **PROTECTIVE BASE**

A protective filling material is placed at the base of a deep preparation to act as a barrier to minimize further injury and permit possible pulp healing and repair.

### **Indications**

1. Deep dentin preparations in teeth with vital pulp without pulp exposure.

### **Contraindications**

1. Nonvital pulp or vital but exposed pulp.
2. Clinical signs and/or symptoms of irreversible pulpitis.

### **Outcomes Assessment**

1. No adverse clinical signs or symptoms
2. Location of a radiopaque base between the permanent restoration and the dentin.
3. Appropriate responsiveness to electrical and thermal pulp tests.
4. No breakdown of the periradicular supporting tissues.

### **INDIRECT PULP CAPPING**

In a tooth which has a carious lesion near the pulp, a protective dressing or cement is placed over a layer of remaining dentin which, if removed, might expose the pulp. The purpose is to protect the pulp against possible injury and to stimulate healing and repair.

### **Indications**

1. Carious lesions in teeth with vital pulp, which, if removed, might expose the pulp.

### **Contraindications**

1. Nonvital pulp or vital but exposed pulp.
2. Clinical signs and/or symptoms of irreversible pulpitis.

### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Radiopaque base should be adjacent to but not in contact with pulpal tissue.
3. Appropriate responsiveness to electrical and thermal vitality tests.
4. No breakdown of the periradicular supporting tissues.

5. No internal or external resorption or abnormal canal calcification as determined by periodic radiographic evaluation.

### **DIRECT PULP CAPPING**

In a tooth with a carious lesion near or into the pulp, a protective calcium hydroxide dressing or cement is placed directly over the vital pulp at the site of the exposure to protect the pulp against further injury and to stimulate healing or repair.

#### **Indications**

1. Aseptic small mechanical or iatrogenic pulpal exposures.
2. Small pulp exposures in teeth with incompletely formed apices.
3. Socioeconomic reasons.
4. Vital pulp without history of irreversible pulpitis.

#### **Contraindications**

1. Irreversibly inflamed or necrotic pulp.
2. Tooth is to serve as an abutment for a fixed or removable prosthesis or the restoration of choice is a crown.

#### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Radiopaque base should be adjacent to, and in contact with pulpal tissue.
3. Appropriate responsiveness to electrical and thermal pulp vitality tests.
4. No breakdown of the periradicular supporting tissue.
5. No internal or external resorption or abnormal canal calcification as determined by periodic radiographic evaluation.

### **PULPOTOMY**

Pulpotomy is the surgical amputation of the coronal portion of vital pulp. It is used to preserve the vitality and function of the remaining radicular portion of the pulp.

#### **Indications**

1. Small pulp exposures in tooth with incompletely formed apices.
2. Socioeconomic reasons.
3. Vital pulp without history of irreversible pulpitis.
4. An emergency procedure until root canal treatment can be accomplished.

#### **Contraindications**

1. Irreversibly inflamed or totally necrotic pulp.

#### **Outcomes Assessment**

1. No adverse clinical signs or symptoms
2. Radiographic evidence of canal and root apex closure occasionally accompanied by an increase in root length.
3. No breakdown of periradicular supporting tissues
4. No internal or external resorption or abnormal canal calcification as determined by periodic radiographic evaluation.

## **NONSURGICAL ENDODONTIC PROCEDURES**

### **ROOT CANAL TREATMENT**

Endodontic therapy for permanent teeth involves a biologically based chemical and mechanical debridement of the root canal system to eliminate pulpal disease and to promote healing and repair of periradicular tissues. The debridement and shaping of the canal system is followed by obturation with a biologically acceptable nonabsorbable semisolid or solid core root canal filling material.

All canals are shaped, cleansed, and disinfected using aseptic technique. Proper access is dictated by the size and shape of the pulp chamber as well as by the tooth position in the arch. In all cases, the entire roof of the chamber must be removed. Debridement, enlargement, and disinfection of all canals and obturation are accomplished under rubber dam isolation. When indicated, microbial culture and sensitivity determinations are used.

Obturation is the three-dimensional filling of the entire root canal system as close to the cemento-dentinal junction as possible. Minimal amounts of root canal sealers, which have been demonstrated to be biologically compatible, are used in conjunction with core filling material to establish an adequate seal.

It is recognized that root canal instruments will fail occasionally due to manufacturing deficiencies beyond the control of the practitioner. When instrument failure occurs in a root canal, the remainder of the root canal space should be sealed with a biologically acceptable non-restorable semi-solid or solid core root canal filling material. The patient must be informed of the complication.

### **Indications**

1. Carious pulp exposure on a permanent tooth.
2. Vital, irreversibly inflamed pulp.
3. Tooth with necrotic pulp.
4. Extensive loss of tooth structure where restorative considerations exist.

### **Contraindication**

Pulp is vital, but with reversible pulpitis.

### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Radiographic appearance of a dense, three-dimensional filling which extends as close as possible to the cemento-dentinal junction, i.e., without gross overextension or underfilling in the presence of a patent canal; no ledges or perforations are present.
3. No further breakdown of supporting tissues. If a tooth had a periradicular radiolucency indicating chronic periradicular disease at the time of the fill, within 4 years the recall radiographs should demonstrate return to an intact lamina dura and a normal periodontal ligament space around the entire root or roots under observation.
4. If a tooth had a normal periodontal ligament space and an intact lamina dura around the root or roots at the time of obturation, recall radiographs taken 6 months or later postobturation should demonstrate a similar appearance.

### **ENDODONTIC RETREATMENT**

Retreatment is preferred to surgical retrofilling in teeth where the root system is accessible and amenable to reinstrumentation and obturation. Retreatment involves removal of the previously

placed obturation materials in addition to the procedures normally used in orthograde endodontic treatment. Post removal may also be necessary. Further efforts may be required to correct radicular defects, ledges, calcifications, and separated instruments.

Retreatment cases vary greatly in complexity, requiring greater effort, time, and skill, and should be undertaken with due regard to practitioner ability and expertise. Retreatment may need to be augmented by other procedures such as apexification or transmucosal intervention.

### **Indications**

1. An incompletely debrided or filled root canal system with a radiographically observable unfilled root canal space.
2. Cases of unresolved periradicular pathosis and radiographic evidence of a deficiency in the quality of root canal filling.
3. Cases where removal of existing obturation materials as dictated by anticipated restorative or prosthetic procedures.
4. Cases where persistent symptoms are associated with a previously treated tooth and there is reason to question the adequacy of previous endodontic debridement and/or obturation.
5. Evidence of prolonged coronal leakage into the root canal system.

### **Contraindications**

1. Persistent apical inflammation despite evidence of adequate debridement and obturation and in the presence of an adequate cast restoration.
2. Presence of a vertical root fracture.
3. Calcification, separated instrument, and/or other errors precluding access to apical canal system.

### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Radiographic appearance of a dense, three-dimensional filling which extends as close as possible to the cemento-dentinal junction, i.e. without gross overextension or underfilling in the presence of a patient canal. No ledges or perforations are present.
3. No further breakdown of supporting tissues. If a tooth had a periradicular radiolucency indicating chronic periradicular disease at the time of the fill, then the recall radiographs should demonstrate a return to an intact lamina dura and normal periodontal ligament space around the entire root or roots under observation. If a tooth had a normal periodontal ligament space and intact lamina dura around the root or roots at the time of obturation, the subsequent postoperative radiographic appearance should remain the same.

### **APEXIFICATION**

Apexification is a method of inducing apical closure or apical development of the root or roots of an incompletely formed permanent tooth with a pulp. It may involve several treatments over an extended period of time. Calcium hydroxide compounds are commonly used for this purpose. When root closure is complete, endodontic therapy must be performed.

### **Indications**

1. Root pulp necrotic, with or without apical periodontitis.

### **Contraindications**

1. Pulp vital.

**Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Radiographic evidence of apical closure without supporting tissue breakdown.
3. No lateral root surface pathosis.
4. Healing of periradicular pathosis.

**SURGICAL ENDODONTIC PROCEDURES****INCISION AND DRAINAGE - SOFT TISSUE**

Incision and drainage is a surgical procedure designed to release accumulated byproducts of tissue breakdown, collect samples for bacteriologic analysis, and provide a more favorable gradient and pathway for drainage.

**Indications**

Acute swelling with localized fluctuance.

**Contraindications**

1. No abscess localized or fluctuating.

**Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Relief of accurate symptoms.
3. Reduction of acute cellulites with localized fluctuance.
4. Return to normal soft tissue architecture.

**INCISION AND DRAINAGE - SOFT AND HARD TISSUE**

Incision and drainage through both the soft and hard tissues is a surgical procedure performed to liberate accumulated byproducts of tissue breakdown by surgical reflection of the soft tissue and penetration of the cortical plate in the periradicular area.

**Indications**

1. For the relief of pain caused by a buildup of fluid within the bony tissue.

**Contraindications**

1. Fluctuating abscess that can be localized and drained.

**Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Relief of acute symptoms.
3. No damage to root structure because of the procedure.
4. Soft tissue closure over the surgical site without fenestration.
5. No damage to the alveolar bone, roots of adjacent teeth, or other anatomical structures.

**PERIRADICULAR CURETTAGE**

Periradicular curettage consists of the removal of soft tissue and/or foreign material around the root apex without root end removal.

**Indications**

1. A marked apical over extension into the periradicular tissue of filling materials, that acts as an irritant.

2. A periradicular lesion that is enlarging after acceptable root canal treatment, as noted on follow-up radiographs.
3. A persistent periradicular lesion that has not decreased in size one or two years after the completion of root canal treatment.
4. A persistent sinus tract or periradicular inflammation.
5. Cases when a biopsy or surgical exploration of the area is deemed necessary.

### **Contraindications**

1. As the sole procedure for treatment of endodontic failures without addressing the cause.

### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Alveolar bone at the apex of the treated root(s) has a normal appearance with reestablishment of a normal periodontal ligament space.
3. No damage to adjacent teeth or anatomical structures.
4. No sinus tract present.

### **APICOECTOMY**

Apicoectomy is a surgical procedure in which part of the tooth root apex is removed to evaluate or improve the apical seal of the root canal filling; to facilitate access for creation of a root end preparation for a retrofilling; to allow for curettage behind the root; or to remove a portion of the root that cannot be obturated because of severe curvature of the root, calcification of the root canal space, etc. This procedure may include curettage of the apical tissue.

### **Indications**

1. A marked apical or lateral over extension of filling materials into the periradicular tissues.
2. A periradicular lesion that is enlarging as noted on follow-up radiographs.
3. A periradicular lesion that has not decreased in size one or two years after root canal treatment.
4. A persistent sinus tract or periradicular inflammation.
5. Cases where apical curettage reveal an inadequate seal of a previously filled root.
6. An unfilled apical portion of the root canal system not accessible from a coronal approach.
7. Roots that cannot be retreated nonsurgically because of an obstruction such as a post or a separated instrument.

### **Contraindications**

When retreatment is more feasible and will correct an obvious deficiency in debridement or obturation.

### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Alveolar bone at the apex of the surgically altered root(s) should have normal appearance with reestablishment of the normal periodontal ligament space.
3. Sinus tract, if previously present, has healed.
4. No damage to adjacent teeth or anatomical structures.

### **RETROFILLING**

Retrofilling is an additional procedure following apicoectomy by which a cavity is prepared in the root end or lateral aspect of the root and a biologically acceptable filling material is placed into that prepared cavity.

**Indications**

1. Correction of respective defects of the root.
2. Cases where the dentist is unable to negotiate a canal in a routine manner because of iatrogenic problems or anatomic complications of the canal system.
3. Previously treated teeth where an inadequate apical seal is indicated by a periradicular lesion which is enlarging or has not decreased in size over a two year period after completion of root canal filling.
4. A tooth that has periradicular symptoms or pathosis and had a post crown which cannot be removed.
5. Treatment of root perforations.
6. Persistent or recurrent signs and/or symptoms of lateral or periapical pathosis which cannot be sealed by a nonsurgical approach.

**Contraindications**

1. When retreatment is more feasible and will correct an obvious deficiency in debridement or obturation.

**Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Alveolar bone at the site of repair of the treated root(s) should have normal appearance with reestablishment of the periodontal ligament space.
3. Retrofilling material should be within the confines of the root and should seal the root canal(s) and isthmus areas if present.
4. Scatter of retrofilling material into the surrounding bone should be avoided.
5. No damage to adjacent teeth or anatomical structures.

**BIOPSY**

A biopsy involves the surgical removal of a hard or soft tissue specimen for microscopic examination.

**Indications**

1. Tissue or foreign material is removed at or near the surgical site.
2. Unusual tissues are noted on clinical or radiographic examination.
3. A medical history indicates the merits of biopsy of all tissues removed. (See Oral Pathology Tissue Management)

**Contraindications**

1. For apical periodontitis of obvious or probable endodontic origin which would be treated by root canal treatment or nonsurgical treatment. (See Oral Pathology Tissue Management)

**Outcomes Assessment**

1. To establish or confirm a diagnosis by microscopic examination of tissues or foreign materials.

**HEMISECTION AND BISECTION**

Hemisection and Bisection (Bicuspidization) are surgical procedures that are used to separate a portion of the crown and one or more of the roots of a multirouted tooth. Both procedures are most commonly performed on mandibular molars. Hemisections may, however, be performed on maxillary molars or maxillary bicuspid. The separated segments may be removed or restored. In certain instances it is feasible to section a mandibular molar into two distinct separate roots.

Subsequently, the separate roots are restored as though each root was a bicuspid root. This procedure is commonly called a bisection.

Hemisection requires root canal treatment on all remaining roots. Bisection requires root canal therapy on all canals of each root. In each case, it is preferable to complete the root canal fillings before the surgery.

### **Indications**

1. “Through and through” periodontal furcation defects.
2. An untreatable infrabony defect in one root of a multirouted tooth.
3. Crown fracture extending into the furcation.
4. Teeth where nonsurgical endodontic treatment is not possible or unsuccessful for at least one root, and apical surgery is not possible.
5. Teeth with a vertical root fracture confined to the root which is to be separated and extracted.
6. Cases with secondary periodontal involvement.
7. Cases of persistent sinus tract, recurrent periradicular pathosis, or periradicular inflammation where nonsurgical treatment or periradicular surgery is not possible.
8. Inoperative or uncorrectable resorptive defects of the root.
9. Furcal perforation.

### **Contraindications**

1. Poor periodontal support.
2. All roots affected.
3. Abnormally short roots.

### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Elimination of a furcation and periodontal pockets; total amputation of the coronal portion of the tooth that is associated with the root to be removed.
3. Adequate structure supporting the remaining roots(s) to maintain tooth function.
4. Remaining root in satisfactory condition.
5. Adequate root canal fillings in the remaining root.

## **ROOT AMPUTATION**

Root amputation is the removal of a root of a multirouted tooth without the corresponding portion of the crown when insufficient periodontal supporting tissue warrants the removal of this section of the tooth.

Root amputation requires root canal treatment of all remaining roots, preferably before the surgery.

### **Indications**

1. “Through and through” periodontal furcation defects.
2. An untreatable infrabony defect in one root of a multirouted tooth.
3. Fractures extending into the furcation.

4. Teeth where nonsurgical endodontic treatment is not possible or unsuccessful for at least one root, and periapical surgery is not possible.
5. Teeth with a vertical root fracture confined to the root to be separated and extracted.
6. Cases with secondary periodontal involvement.
7. Cases of persistent sinus tract, periradicular inflammation, or periradicular pathosis where nonsurgical root canal therapy or periradicular surgery is not possible.
8. Inoperative or uncorrectable root resorptive defects.
9. Furcal or stripping perforations.

### **Contraindications**

1. Poor periodontal support.
2. All roots affected.
3. Abnormally short roots.

### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Elimination of the furcation and periodontal pockets.
3. Adequate supporting structure surrounding the remaining roots to maintain tooth function.
4. Adequate root canal fillings in remaining root(s).
5. Seal of all external openings into the pulp chamber.
6. Elimination of pre-operative signs and symptoms of pathosis.

## **REPLANTATION OF AVULSED TEETH**

Replantation of the avulsed tooth involves the replacement of a tooth into its natural alveolus after it has been accidentally avulsed or luxated out of its alveolar socket. The goal is normal reattachment of the periodontal ligament and the return of normal tooth function. Success depends upon accomplishing the replantation as soon as possible after the accident and keeping the root moist during the extraoral period. The involved teeth should be stabilized for a period of time. Pulp tissues should be removed within two weeks following the injury. The intracanal treatment usually consists of placement of calcium hydroxide, which may need to be replaced periodically, followed by placement of an acceptable root canal filling material. These teeth should be periodically re-examined following replantation.

### **Indications**

1. Tooth avulsed due to trauma.

### **Contraindications**

1. Tooth with additional fractures compromising future root canal treatment.

### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Proper anatomic placement of tooth into the socket.
3. Minimal resorption of tooth root structure.
4. No ankylosis.
5. No breakdown of periradicular supporting tissues.

6. Maintenance of the tooth as a firm, functional member of the dentition.

### **INTENTIONAL REPLANTATION OR TRANSPLANTATION**

Intentional replantation involves the removal of a tooth from its alveolar socket, the apical retrograde sealing of the canals or lateral root defect with an inert filling material, and the insertion of the tooth into its alveolar socket.

Intentional transplantation involves the same procedures as the replantation except the tooth is transplanted into the socket of another extracted tooth.

These teeth should be periodically reexamined following replantation or transplantation.

#### **Indications**

1. Pulpotomy or root canal treatment is not possible, has not been successful, or when conventional surgery *in situ* is not advisable.

#### **Contraindications**

1. Conventional orthograde or retrograde endodontic therapy can be performed.

#### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Proper anatomic orientation of tooth in its socket.
3. Elimination or absence of lateral root or periapical pathosis (some root resorption may occur).
4. No periodontal pathosis.
5. Root length minimally shortened.
6. Proper placement of the apical seal(s).
7. Maintenance of the tooth as a firm, functional member of the dentition.

### **BLEACHING PROCEDURES**

Bleaching is the reduction of discoloration of a vital or pulpless tooth through the application of oxidizing agents to the available surfaces of the affected tooth. Success in restoration to normal tooth shade and translucency is dependent upon the cause, severity, and duration of the discoloration.

#### **INTERNAL BLEACHING**

Internal bleaching is indicated for discolored teeth that have previously received a root canal filling. Assuming that the canal seal is adequate, 30 to 35 percent hydrogen peroxide, along with other activating agents, is used to affect the oxidation process.

#### **Indications**

1. Discolored teeth which have previously received a root canal filling.

#### **Contraindications**

1. Tooth has root filling of poor quality.
2. Extensive restorations of crown.

#### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Reduction in degree of discoloration.
3. Improved translucency.
4. No cervical external root resorption.

## **EXTERNAL BLEACHING**

External bleaching is indicated for treatment of discolored enamel. It can use acid conditioning procedures along with oxidizing agents to lighten affected teeth. These agents are applied to the external surface of the tooth. This procedure is commonly indicated for teeth that are discolored because of endemic fluorosis or tetracycline staining.

### **Indications**

1. Discolored vital tooth with normal pulp.

### **Contraindications**

1. Extensive dental restorations.

### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Reduction in degree of discoloration.
3. No cervical external root resorption.

## RESTORATIVE DENTISTRY

### **Definition of Restorative Dentistry**

The discipline of Restorative Dentistry is that area of dental practice concerned with the diagnosis, prevention, interception, preservation and treatment of natural teeth defects by restorations and replacement with fixed partial dentures. These defects may include dental caries, erosion, abrasion, attrition, hypoplasia, developmental anomalies, hypocalcifications, discoloration, trauma, and missing teeth. Treatment goals are to restore the natural dentition to normal health and function. These goals can offer significant challenge and great satisfaction to both patient and clinician by transforming a poorly functioning masticatory system to an attractive, comfortable and healthy orofacial unit. Success requires meticulous attention to detail from the initial patient interview through treatment planning and operative procedures into a planned schedule of follow-up care. Restorative treatment spans an age range from adolescence to geriatric patients. It also involves an array of clinical and laboratory procedures, thereby testing the depth of knowledge and experience of the clinician.

### **PIT AND FISSURE SEALANTS**

Pit and Fissure Sealants protect caries-susceptible tooth surfaces least benefited by fluoride. Sealants can play a significant role in the prevention and control of dental caries in pits and fissures of primary and permanent teeth. Sealants should be placed as soon as possible after tooth eruption when isolation can be achieved without moisture contamination.

#### **Indications**

1. Non-carious or questionable carious primary or permanent, premolar and molar teeth with deep pits and/or fissures, and in the cingulum area of maxillary incisors with deep lingual pits and/or fissures.

#### **Contraindications**

1. Inability to obtain isolation and moisture control.
2. Obvious dental caries.

#### **Outcomes Assessment**

1. No evidence of caries development beneath or adjacent to the sealant.
2. Normal occlusal relationship maintained.
3. Sealant remains intact and covers susceptible pits and fissures.

### **PREVENTIVE RESIN RESTORATION**

Preventive resin restorations are small, distinct composite resin restorations that are used to restore carious lesions followed by placement of occlusal sealants to protect susceptible, but uninvolved pits and/or fissures. Preventive resin restorations generally require minimal tooth preparation to remove caries from one or more susceptible sites in the pits and/or fissures.

#### **Indications**

1. Deep pits and fissures in primary and permanent teeth that are suspected of being carious or exhibit frank caries in isolated areas.

#### **Contraindications**

1. Inability to obtain isolation and moisture control.
2. Extensive caries.

**Outcomes Assessment**

1. No evidence of caries development beneath or adjacent to the preventive resin restoration.
2. Normal occlusal relationships maintained.
3. Preventive resin restoration remains intact and covers involved and/or susceptible pits and fissures.

**DENTAL AMALGAM**

Dental amalgam is a direct placement, intermetallic compound, restorative material. It is used to restore tooth defects resulting from dental caries, tooth fracture, or to replace defective restorations. Dental amalgam requires sound tooth structure for support, retention and resistance form. The use of dental amalgam in restorations to replace cusps and large areas of tooth is not paradigmatic, and should be restricted where possible. When additional retentive designs are incorporated (pins, slots, posts) dental amalgam can be used as a core build-up material for subsequent crown restorations.

**Indications**

1. For restoration of tooth defects resulting from either dental caries, tooth fracture, or to replace defective restorations.
2. For use in Class I, II, III, or V restorations.
3. For use as a crown core/build-up restoration.
4. Patient economic resources.
5. Patient preference.

**Contraindications**

1. Patient has a demonstrated allergy or medical intolerance to a component of the restorative material.
2. Where esthetics is a primary consideration.
3. When there is not sufficient sound tooth structure to support and retain the restoration.

**Outcomes Assessment**

1. No evidence of caries development beneath or adjacent to the amalgam restoration.
2. Normal occlusal relationships maintained.
3. The restoration remains intact and functions acceptably.

**COMPOSITE RESIN (DIRECT PLACEMENT)**

Composite resin is a polymer based resin matrix containing an inorganic filler particle phase. It is used to restore tooth defects resulting from dental caries, tooth fracture, tooth defects, or to replace defective restorations. Composite resin is primarily used in anterior teeth where esthetics is a primary concern. However, it has also found use in posterior teeth where clinical conditions and patient preferences are appropriate.

**Indications**

1. For restoration of tooth defects from dental caries, tooth fracture, esthetic concerns, or replacement of defective restorations.
2. For use in Class I, III, IV, V or veneer anterior restorations.
3. For use in Class I, II, or V posterior restorations when:
  - Esthetics is a primary patient concern.
  - Appropriate isolation is attainable.
  - Where there are some centric occlusal stops remaining in tooth enamel.

- Tooth reinforcement is required in situations where a cast restoration may not be an option.
- When there is insufficient tooth structure for macromechanical retention and the ability to bond a restoration to tooth is required.
- Restoration of the post-endodontically treated tooth in which minimal loss of tooth structure has occurred.
- Patient economic resources.
- Patient preference.

### **Contraindications**

1. Patient has a demonstrated allergy or medical intolerance to a component of the restorative material.
2. When proper isolation of the operating field is not possible.
3. When all occlusal centric stops would be restored with composite resin.

### **Treatment Goals/Expected Outcomes**

1. No evidence of caries development beneath or adjacent to the composite resin restoration.
2. Normal occlusal relationships and tooth contours are maintained.
3. The restoration remains intact and functions acceptably.

### **GLASS IONOMER**

Glass ionomers are water-based cements consisting of aluminio-silicate glasses, interacted with a form of poly (alkenoic) acid, with or without a polymer based resin matrix. Glass ionomers are used to restore tooth defects from dental caries, tooth fracture, tooth defects, or to replace defective restorations. Primary use for the glass ionomer is in clinical situations where adhesion to tooth is required and fluoride release is a clinical benefit.

### **Indications**

1. For restoration of tooth defects from either dental caries, tooth fracture, esthetics, or to replace defective restorations.
2. For use in Class I (not including the occlusal surface), III or V restorations.
3. Restoration of root surface carious lesions.
4. When fluoride release may be beneficial.
5. When there is insufficient tooth structure for macromechanical retention and the ability to bond a restorative material to tooth is required.
6. When esthetics is a consideration.
7. Patient preference.

### **Contraindications**

1. Patient has a demonstrated allergy or medical intolerance to a component of the restorative material.
2. When proper isolation of the operating field is not possible.
3. When occlusal centric stops or proximal contact areas would be restored with glass ionomer.
4. When significant abrasive forces such as a clasp from a removable partial denture are anticipated.

### **Outcomes Assessment**

1. No caries development beneath or adjacent to the glass ionomer restoration.
2. Normal occlusal relationships and tooth contours are maintained.
3. The restoration remains intact and continues to function acceptably.

## **CAST GOLD INLAY**

An indirect restorative procedure using cast gold dental alloy primarily in intracoronal restorations. The cast gold inlay is used to restore conservative tooth defects resulting from dental caries, tooth fracture, tooth defects, or to replace defective restorations.

### **Indications**

1. For restoration of tooth defects from dental caries, tooth fracture, or to replace defective restorations.
2. For use in Class I, II, III, or V restorations.
3. Where patient has an occlusal function or needs a proximal contour that exceeds the capacity of dental amalgam or composite resin as suitable restorative material options.
4. When specific tooth contours are required, i.e. axial contours necessary for fabrication of a clasp on a removable partial denture.
5. A retainer for an etched metal restoration.
6. Patient preference.

### **Contraindications**

1. When there is insufficient sound tooth structure to support and retain the restoration.
2. Poor periodontal prognosis for tooth retention.
3. Presence of a direct pulp cap.
4. Patients with high and/or poorly controlled caries activity.
5. Where esthetics is a primary concern.
6. Patient preference.
7. Patient economic resources.

### **Outcomes Assessment**

1. No evidence of caries development beneath or adjacent to the cast gold restoration.
2. Normal occlusal relationships and tooth contours are maintained.
3. Pulp vitality maintained.
4. The restoration remains intact and functions acceptably.

## **INDIRECT COMPOSITE RESIN INLAY/ONLAY**

An Indirect Composite Resin Inlay/Onlay is an indirect restorative procedure using composite resin. Usually the composite resin will have received an additional extra-oral cure to improve its clinical performance. This is a restoration that is bonded to the tooth with a composite resin luting material.

### **Indications**

1. For restoration of tooth defects from either dental caries, tooth fracture, esthetics, or to replace defective restorations.
2. For use in Class I, II, III, IV, V or veneer restorations.
3. When there is insufficient tooth structure for macromechanical retention and the ability to bond a restoration to tooth is required.
4. Tooth reinforcement is required when a cast restoration is not an option.
5. Restoration of the post-endodontically treated tooth in which significant loss of tooth structure has occurred.
6. Esthetics.
7. Patient preference.

### **Contraindications**

1. Patient has a demonstrated allergy or medical intolerance to a component of the restorative material.
2. Poor periodontal prognosis for tooth retention.
3. Presence of a direct pulp cap.
4. Patients with high and/or poorly controlled caries activity.
5. When proper isolation of the operating field is not possible.
6. When all occlusal centric stops would be restored with composite resin.
7. When significant abrasive forces such as a clasp from a removable partial denture are anticipated.
8. When there is insufficient sound tooth structure to support and retain the restoration.
9. Patient preference.
10. Patient economic resources.

### **Outcomes Assessment**

1. No evidence of caries development beneath or adjacent to the indirect composite resin restoration.
2. Normal occlusal relationships and tooth contours are maintained.
3. The restoration remains intact and functions acceptably.

### **PORCELAIN INLAY/ONLAY**

A Porcelain Inlay/Onlay is an indirect restorative procedure using dental porcelain as the restorative material. This is a restoration that is bonded to the tooth with a composite resin luting material and is primarily limited to use in the posterior teeth where esthetics and tooth reinforcement are indicated.

### **Indications**

1. For restoration of tooth defects from either dental caries, tooth fracture, esthetics, or to replace defective restorations.
2. For use in Class I, II, III, IV or V restorations.
3. When there is insufficient tooth structure for macromechanical retention and the ability to bond a restoration to tooth is required.
4. When tooth reinforcement is required in situations where a cast restoration is not an option.
5. Esthetics.
6. Patient preference.

### **Contraindications**

1. Patient has a demonstrated allergy or medical intolerance to a component of the restorative material.
2. Poor periodontal prognosis for tooth retention.
3. Presence of a direct pulp cap.
4. Patients with high and/or poorly controlled caries activity.
5. When proper isolation of the operating field is not possible.
6. When there is insufficient sound tooth structure to support and retain the restoration.
7. Patient preference.
8. Patient economic resources.

### **Outcomes Assessment**

1. No evidence of caries development beneath or adjacent to the porcelain inlay/onlay.
2. Normal occlusal relationships and tooth contours are maintained.
3. The restoration remains intact and functions acceptably.

## **PORCELAIN VENEER**

The porcelain veneer is primarily an esthetic restoration involving the incisor teeth and sometimes the maxillary premolars. A labial veneer is constructed in the dental laboratory and is bonded to the tooth with a composite resin luting material. These restorations are used to modify tooth color and contour.

### **Indications**

1. For use on facial surfaces of incisor and maxillary premolar teeth.
2. When there is sufficient tooth enamel remaining (75% of the restored tooth surface).
3. Esthetic improvement of tooth color and/or contour.
4. Closure of anterior diastemas.
5. Normal occlusal function and posterior occlusal support.
6. Patient preference.

### **Contraindications**

1. Patient has a demonstrated allergy or medical intolerance to a component of the restorative material.
2. Poor periodontal prognosis for tooth retention.
3. When proper isolation of the operating field is not possible.
4. When there is insufficient sound tooth structure, enamel, to support and retain the restoration.
5. Patient economic resources.
6. Unrealistic patient expectations.

### **Outcomes Assessment**

1. No evidence of caries development beneath or adjacent to the restoration.
2. Normal functions and tooth contours are maintained.
3. Desired, achievable, esthetic result obtained.
4. The restoration remains intact and functions acceptably.

## **PARTIAL CROWN COVERAGE-ALL METAL (Cast Onlay, 3/4 Crown, 7/8 Crown)**

The Partial Crown Coverage-all metal restoration is an indirect restorative procedure which requires some cuspal coverage but less than full replacement or coverage of the enamel crown.

### **Indications**

1. For restoration of tooth defects from either dental caries, tooth fracture, or to replace defective restorations involving a significant amount of the clinical crown.
2. Restoration where definitive occlusal support is to be created and maintained.
3. Retainer for a fixed partial denture.
4. Retainer and rest seat for removable partial denture clasp.
5. Restoration of the post-endodontically treated tooth in which significant loss of tooth structure has occurred.
6. Patient preference.

### **Contraindications**

1. Patient has a demonstrated allergy or medical intolerance to a component of the restorative material.
2. Poor periodontal prognosis for tooth retention.
3. Presence of a direct pulp cap.
4. Patients with high and/or poorly controlled caries activity.
5. When there is insufficient sound tooth structure to support and retain the restoration.

6. Esthetics.
7. Patient preference.
8. Patient economic resources.

**Outcomes Assessment**

1. No evidence of caries development beneath or adjacent to the restoration.
2. Normal occlusal relationships and tooth contours are maintained.
3. The restoration remains intact and continues to function acceptably.

**FULL CROWN COVERAGE (ALL METAL)**

The Full Crown Coverage-all metal restoration is an indirect restorative procedure involving full replacement of the functional clinical crown.

**Indications**

1. For restoration of tooth defects from extensive dental caries, tooth fracture, or to replace defective restorations.
2. Short clinical crowns that would compromise retention of partial coverage restorations.
3. Restoration where definitive occlusal support is to be created and maintained.
4. Retainer for a fixed partial denture.
5. Retainer and rest seat for removable partial denture clasp.
6. Restoration of the post-endodontically treated tooth in which significant loss of tooth structure has occurred.
7. Patient preference.

**Contraindications**

1. Patient has a demonstrated allergy or medical intolerance to a component of the restorative material.
2. Poor periodontal or endodontic prognosis for tooth retention.
3. Presence of a direct pulp cap.
4. Patients with high and/or poorly controlled caries activity.
5. When there is insufficient sound tooth structure to support and retain the restoration.
6. Esthetics.
7. Patient preference.
8. Patient economic resources.

**Outcomes Assessment**

1. No evidence of caries development beneath or adjacent to the restoration.
2. Normal occlusal relationships and tooth contours are maintained.
3. The restoration remains intact and continues to function acceptably.

**FULL CROWN COVERAGE (Porcelain Fused to Metal)**

The Full Crown Coverage-(Porcelain Fused to Metal) restoration is an indirect restorative procedure involving full replacement of the functional clinical crown. A cast metal core is veneered with dental porcelain to provide an esthetic and functional outer surface.

**Indications**

1. For restoration of tooth defects from either dental caries, tooth fracture, developmental defects, or to replace defective restorations.
2. Restoration where definitive occlusal support is to be created and maintained.
3. Retainer for a fixed partial denture.
4. Retainer and rest seat for removable partial denture clasp.

5. Esthetics.
6. Patient preference.

#### **Contraindications**

1. Patient has a demonstrated allergy or medical intolerance to a component of the restorative material.
2. Poor periodontal prognosis for tooth retention.
3. Presence of a direct pulp cap.
4. Patients with high and/or poorly controlled caries activity.
5. When there is not sufficient sound tooth structure to support and retain the restoration.
6. Patient preference.
7. Patient economic resources.

#### **Outcomes Assessment**

1. No evidence of caries beneath or adjacent to the restoration.
2. Normal occlusal relationships and crown contours are maintained.
3. The restoration remains intact and continues to function acceptably.

#### **FULL CROWN COVERAGE (All Porcelain)**

The Full Crown Coverage-(All Porcelain) restoration is an indirect restorative procedure involving full replacement of the functional clinical crown. The crown is fabricated from different porcelains without a metal substructure. These restorations are usually limited to single unit crowns and are indicated when maximum esthetics is desired for a full coverage crown.

#### **Indications**

1. For restoration of tooth defects from either dental caries, tooth fracture, developmental defects, or replacement of defective restorations.
2. When full coverage is required and the esthetic demand is paramount.
3. Retainer for a fixed partial denture.
4. Retainer and rest seat for removable partial denture clasp.
5. Patient preference.

#### **Contraindications**

1. Patient has a demonstrated allergy or medical intolerance to a component of the restorative material.
2. Poor periodontal prognosis for tooth retention.
3. Presence of a direct pulp cap.
4. Patients with high and/or poorly controlled caries activity.
5. When there is insufficient sound tooth structure to support and retain the restoration.
6. Excessive or abrasive occlusal function.
7. Patient preference.
8. Patient economic resources.

#### **Outcomes Assessment**

1. No evidence of caries beneath or adjacent to the Full Crown Coverage-(All Porcelain) restoration.
2. Normal occlusal functions and tooth contours are maintained.
3. The restoration remains intact and continues to function acceptably.

## **IMPLANT SUPPORTED CROWNS**

An implant supported crown(s) is a treatment option for patient with partial edentulism. Prosthodontic evaluation is performed to determine the patient's suitability for an implant supported crown(s). Surgical assessment is performed to determine if contraindications exist for implant therapy.

### **Indications**

1. Lack of mastication.
2. Impaired speech.
3. Esthetics.
4. Partial edentulism.
5. Unsatisfactory existing prostheses.

### **Contraindications or Risk Factors Affecting Quality of Treatment**

1. Bone factors (quantity and quality).
2. Pre-existing systemic conditions.
3. History of radiation therapy.
4. Insufficient interarch space.
5. Active periodontal disease.
6. Tobacco use.
7. Biomechanical loading factors.
8. Occlusal factors.
9. Current and past pharmaceutical therapies.

### **Outcomes Assessment (favorable)**

1. Long-term preservation of supporting bone.
2. Improved function.
3. Improved speech.
4. Improved esthetics.
5. Reduced pain during function.
6. Preserve tooth structure.
7. Improved intra-arch and interarch integrity and stability.

## **AMALGAM/COMPOSITE RESIN CORE BUILD-UP RESTORATION**

A core restoration replaces tooth structure before crown fabrication. Without a core, there would not be enough remaining clinical crown for adequate crown retention and resistance form. Core restorations are fabricated from dental amalgam or composite resin and may or may not involve a post.

### **Indications**

1. A tooth with successful endodontic treatment that requires a cast restoration.
2. A tooth with inadequate coronal structure to provide retention and resistance form for a crown restoration.
3. As a foundation restoration for subsequent tooth restoration with a cast metal or porcelain fused to metal restoration.
4. There is enough tooth structure to provide support and retention for dental amalgam or composite resin.

### **Contraindications**

1. Questionable or poor endodontic prognosis for the tooth.

2. Insufficient tooth structure remaining to adequately support and retain the core restoration.
3. Poor periodontal prognosis for tooth retention.
4. Patient economic resources.

#### **Outcomes Assessment**

1. No evidence of caries development beneath or adjacent to the restoration.
2. The restoration remains intact and continues to function acceptably.

#### **POST RESTORATION**

A Post is a restorative procedure in which part of a metallic post is placed into the prepared space of an endodontically treated tooth. The remainder of the post protrudes into the space of the clinical crown. The post can be either a prefabricated post or one which is custom made to adapt to the specific root canal space. The post provides a retentive base serving as a portion or all of the retentive form upon which a core build-up is fabricated. The use of a post is subsequent to the placement of a proper root canal filling material which provides for a clinically acceptable apical seal.

#### **Indications**

1. A non-vital tooth with successful endodontic treatment.
2. An endodontically treated tooth with extensive loss of coronal tooth structure, which by itself, is not adequate for retention and resistance form for a crown restoration, core buildup, or extensive dental amalgam or composite resin restoration.
3. A prepared post space that permits for a remaining 3-6 mm of undisturbed root canal filling material, as measured from the tooth apex.
4. A prepared post space at least equal to the length of the restored clinical crown.

#### **Contraindications**

1. Questionable or poor endodontic prognosis for the tooth.
2. Insufficient remaining tooth structure to adequately retain the post and/or core restoration.
3. Poor periodontal prognosis for tooth retention.
4. Patient economic resources.

#### **Outcomes Assessment**

1. No evidence of caries beneath or adjacent to the restoration.
2. Absence of root fracture.
3. No compromise of the endodontic apical seal.
4. The restoration remains intact and continues to function acceptably.
5. Radiographic evidence of successful root canal therapy and absence of root fracture.

#### **POST/CORE CAST METAL RESTORATION**

A post is placed in an endodontically treated tooth to provide retention for the overlaying core of restorative material. The core serves as a foundation for the final tooth restoration. It is not intended for tooth reinforcement. When there is insufficient remaining tooth structure to adequately retain a direct placement post/core restoration, the cast metal post/core is a viable clinical alternative.

#### **Indications**

1. A tooth with successful endodontic treatment that requires a cast restoration.
2. As a foundation restoration for subsequent tooth restoration with a cast metal or porcelain fused to metal crown.

3. There is insufficient tooth structure to provide retention for the core component of the restoration.
4. A prepared post space that permits 3-6 mm of undisturbed root canal filling material as measured from the tooth apex.
5. A prepared post space at least equal to the length of the restored clinical crown.

#### **Contraindications**

1. Questionable or poor endodontic prognosis for the tooth.
2. Insufficient remaining tooth structure to adequately support a post and core restoration.
3. Inadequate crown to root ratio of the final restoration.
4. Tortuous canals or thin, ribbon shaped roots.
5. Poor periodontal prognosis for tooth retention.
6. Patient economic resources.

#### **Outcomes Assessment**

1. No evidence of caries beneath or adjacent to the case metal post/core restoration.
2. Absence of root fracture.
3. No compromise of endodontic apical seal.
4. The observed restoration remains intact and continues to function acceptably.
5. Radiographic evidence of successful root canal therapy and absence of root fracture.

### **NON-METALLIC POST RESTORATION**

The non-metallic post restoration is a prefabricated post restoration that is either ceramic or fiber reinforced polymer material. The non-metallic post is placed into the prepared post space of an endodontically treated tooth. The remainder of the post protrudes into the space of the clinical crown. The post provides the retentive base serving as a portion or all of the retentive form upon which a core buildup is fabricated. The use of a post is subsequent to the placement of a proper root canal filling material which provides for a clinically acceptable apical seal. The non-metallic post is cemented using a total-etch / bonded technique.

#### **Indications**

1. A non-vital tooth with successful endodontic treatment.
2. An endodontically treated tooth with extensive loss of tooth structure, which by itself, is not adequate for retention and resistance form for a crown restoration, core buildup, or composite resin restoration.
3. A prepared post space that permits for a remaining 3-6 mm of undisturbed root canal filling material, as measured from the tooth apex.
4. A prepared post space at least equal to the length of the restored clinical crown.
5. In anterior esthetic situations where metallic posts which block light transmission in the cervical area of the tooth resulting in “graying” of the free marginal gingival.

#### **Contraindications**

1. Questionable or poor endodontic prognosis for the tooth.
2. Insufficient remaining tooth structure to adequately retain the bonded post and/or core restoration.
3. Poor periodontal prognosis for tooth retention.
4. Patient economic resources.

#### **Outcomes Assessment**

1. No evidence of caries beneath or adjacent to the restoration.
2. Absence of root fracture.

3. No compromise of the endodontic seal.
4. The restoration remains intact and continues to function acceptably.
5. Radiographic evidence of successful root canal therapy and absence of root fracture.

### **ETCHED METAL RETAINERS**

An etched metal retainer is an indirect restoration that achieves its retentive form from micromechanical bonding between tooth enamel and microporosities in the metal retainer. The luting agent between the etched metal retainer and tooth enamel is a composite resin material and is, therefore, subject to all the clinical requirements of a polymer bonded restoration. These restorations rely on the availability of adequate tooth enamel for retentive form.

#### **Indications**

1. For restoration of tooth defects from either dental caries, tooth fracture, or to replace defective restorations.
2. For restoration of partial crown coverage of metal based crowns.
3. Abutments for short span (less than 2 pontics) etched metal fixed partial dentures.
4. Abutments for tooth splints.
5. Restorations to modify tooth contours facilitating design of a removable partial denture.

#### **Contraindications**

1. Insufficient remaining tooth enamel for retention.
2. Inadequate crown to root ratio of abutments for tooth replacement procedures.

#### **Outcomes Assessment**

1. No evidence of caries beneath or adjacent to the etched metal retainer restoration.
2. Normal occlusal function and tooth contours can be maintained.
3. The etched metal retainer remains intact and functions acceptably.

### **VITAL TOOTH WHITENING**

Tooth whitening (bleaching) procedures on vital teeth use of a form of peroxide (hydrogen peroxide or carbamide peroxide) that penetrate the tooth structure and oxide areas of tooth discoloration. These agents can be delivered either as an in-office procedure or a combination office/home technique. In-office vital bleaching modifies tooth color by peroxide combined with heat and acid etching of the enamel. The combination office/home technique uses a customized mouth guard/tray containing carbamide peroxide, 10%, or hydrogen peroxide, 2% - 10% gel worn for 30-60 minutes per day.

#### **Indications**

1. Intrinsic tooth discoloration.
2. Teeth without defective restorations or carious lesions.
3. No pre-treatment tooth sensitivity.
4. Patient compliance.
5. Realistic patient expectations.

#### **Contraindications**

1. Extrinsic tooth discoloration.
2. Intrinsic tooth discoloration resulting from corrosion of metallic dental restorations.
3. Teeth with defective restorations or carious lesions.
4. Pre-treatment tooth sensitivity and/or pulpal pathology.
5. Large pulps.

6. Patient not able to tolerate the procedure or comply with the home regimen.
7. Unrealistic patient expectations.

#### **Outcomes Assessment**

1. No adverse clinical signs or symptoms.
2. Reduction in amount or perception of tooth discoloration.
3. The patient and dentist are satisfied with tooth color modification.
4. No post-treatment sensitivity.
5. No cervical external root resorption.

#### **FIXED PARTIAL DENTURE**

A fixed partial denture is a prosthetic appliance permanently attached to remaining teeth to replace one or more missing teeth.

#### **Indications**

1. Edentulous space adjacent to an adequate number of healthy teeth that is suitable for supporting the planned prosthesis.
2. Patient desire for tooth replacement to improve function, esthetics or psychological comfort.

#### **Contraindications**

1. Patient has an allergy or medical intolerance to a component of the restorative material.
2. Guarded periodontal or endodontic prognosis for tooth retention.
3. Presence of direct pulp cap.
4. Patients with high and/or poorly controlled caries activity.
5. Insufficient crown-root ratio.
6. Patient preference.
7. Patient economic resources.

#### **Outcomes Assessment**

1. No evidence of caries beneath or adjacent to the FPD retainers.
2. Normal occlusal relationships and tooth contour are maintained.
3. Patient can maintain good oral hygiene.
4. The fixed partial denture remains intact and functions acceptably.

## REMOVABLE PROSTHODONTICS

Removable Prosthodontics is the branch of dentistry that deals with the replacement of missing teeth with complete and partial dentures. Implant dentistry is a treatment alternative to removable prosthodontics.

### **COMPLETE DENTURES**

Complete dentures are used when a patient has an absence of teeth to serve as abutments for fixed or removable partial dentures. Included in this category are immediate dentures, placed at the time of tooth removal, and overdentures, which use endodontically treated teeth to preserve ridge height.

#### **Indications**

A patient with edentulous maxillary or mandibular ridges or remaining teeth that cannot be salvaged by periodontal or restorative therapy.

#### **Contraindications**

A patient with conditions that may cause poor outcomes, e.g., xerostomia, inadequate ridge height, pathology, refusal of pre-prosthetic surgery, etc.

#### **Outcomes Assessment**

1. Complete dentures are well extended, stable, retentive, and esthetic.
2. Patient can function (mastication, speech, free of pressure areas) and is satisfied with esthetics of the dentures.
3. Overdenture abutment teeth are endodontically and periodontally healthy and caries free.

### **IMPLANT RETAINED MANDIBULAR COMPLETE DENTURE**

An implant retained complete denture is a treatment option for a patient with alveolar resorption of the mandibular ridge. Prosthodontic evaluation is performed to determine the patient's suitability for an implant retained denture opposing a maxillary complete denture. Surgical assessment is performed to determine if contraindications exist for implant therapy.

#### **Indications**

1. Complete edentulism.
2. Alveolar atrophy.
3. High muscle attachments.
4. Tongue position, morphology and activity.
5. Lack of neuromuscular control of orofacial muscle complex.
6. Patient inability to tolerate conventional prosthesis.

#### **Contraindications or Risk Factors Affecting Quality of Treatment**

1. Bone factors (quantity and quality).
2. Pre-existing systemic disease.
3. History of radiation therapy.
4. Tobacco use.
5. Conditions that may prevent proper maintenance of implants.
6. Current and past pharmaceutical therapies.

**Outcomes Assessment (favorable)**

1. Long-term preservation of supporting bone.
2. Improved mastication.
3. Improved speech.
4. Improved swallowing.
5. Improved retention, stability and support of mandibular denture.
6. Improved esthetics.
7. Re-establish and maintain vertical dimension of occlusion.
8. Reduced pain during function.

**REMOVABLE PARTIAL DENTURES**

Removable Partial Dentures are used to restore function in partially edentulous patients.

**Indications**

Patients have partially edentulous arches and: no pathology, abutment teeth with adequate periodontal support, clinical crown morphology with retentive contours, and no large restorations.

**Contraindications**

Inadequate periodontal support for abutment teeth, poor oral hygiene, inadequate clinical crown contours and/or strength of abutment teeth.

**Outcomes Assessment**

1. Partial dentures are retentive, stable; acrylic bases are adequately extended.
2. Patient is satisfied with esthetics, function, and comfort.
3. Remaining teeth and soft tissues are healthy.

**INTERMEDIATE DENTURE**

An intermediate or temporary denture for a patient who requests immediate replacement of teeth following extraction of remaining teeth. The intermediate denture is for esthetics more than function.

**Indications**

A patient who wants to maintain esthetics immediately after extractions.

**Contraindications**

Patients requiring extensive recontouring of alveolar bone or removal of tori.

**Outcome Assessment**

1. Dentures are retentive and stable.
2. Vertical dimension, centric occlusion, and esthetics are preserved.

**PROSTHODONTIC RECALL EXAMINATION**

A prosthodontic recall examination is regularly performed to evaluate the fit and performance of the complete or partial denture and the patient's oral health. Adjustments are made if needed; the denture or partial is polished, remaining teeth are examined and cleaned and prevention is reinforced.

**Indications**

A patient wearing removable partial or complete dentures.

**Contraindications**

None

**Outcomes Assessment**

1. Dentures and or partial dentures are stable and fit adequately.
2. Remaining teeth and soft tissue are healthy.
3. Any further treatment is explained to patient and treatment planned.
4. Preventive strategies have been reinforced to the patient.
5. Recall interval is agreed upon.

**RELINE**

A reline restores the tissue bearing surfaces of a denture base when base adaptation to the edentulous alveolar ridge is deficient. A reline can be performed on a complete or partial denture.

**Indications**

1. Lack of retention and/or stability of the maxillary or mandibular acrylic base due to resorption of the edentulous ridges or inadequate border extension.
2. Lack of retention and/or stability of the maxillary acrylic base due to an inadequate posterior palatal seal.

**Contraindications**

1. Retention and/or stability are affected by factors other than lack of tissue bearing surface adaptation.

**Outcomes Assessment**

1. Denture or partial is well extended, retentive, and esthetic.
2. Improved retention and stability result in patient satisfaction.

**REBASE**

Rebasing a denture replaces the original denture base to compensate for lost oral tissues while leaving teeth in their original position.

**Indications**

Denture teeth are positioned correctly and provide stable occlusion. The vertical dimension is correct and tissues are relatively healthy.

**Contraindications**

Dentures exhibit gross occlusal disharmony. Size, shade, and position of denture teeth are inappropriate or inadequate. The dentures have improperly extended borders.

**Outcome Assessment**

1. Dentures are retentive, stable, and esthetic.
2. Occlusion is preserved and functional.

## ORTHODONTICS

### **CLINICAL EXAMINATION**

All patients of record should receive an initial cursory examination noting facial form and occlusal relationships to detect possible malocclusion. All candidates for limited orthodontic treatment must subsequently receive a comprehensive evaluation. Limited treatment is defined as conditions that can be treated by tipping mechanics and that generally are correctable within six to nine months including the retention phase. This normally limits treatment to minor anterior alignment, uncomplicated molar uprighting, crown lengthening by means of forced eruption, space regaining, and non-skeletal crossbite corrections. The following data are recorded in the chart: medical and dental histories; extraoral facial evaluation and classification; occlusal relationships; functional problems related to mastication, speech and mandibular range of motion. Students are expected to obtain consultations related to pathology, periodontal problems and restorative treatment needs. Active disease must be detected and corrected prior to orthodontic treatment.

### **Indications**

A cursory analysis of facial form and occlusal relationships is required for all patients of record. The in-depth exam described above is for patients with specific limited orthodontic treatment needs.

### **Contraindications**

1. There are no contraindications for the cursory clinical examination.
2. The more in-depth analysis may be unwarranted if the patient has no interest in further treatment or desires referral for comprehensive orthodontic treatment.

### **Outcomes Assessment**

1. Occlusal and facial relationships, functional problems and the morphologic basis of malocclusion are summarized in the orthogonal format.
2. All data and interpretations are recorded on the 4-D form.
3. The patient's chief complaint, collection of consults, determination of interacting factors, and supplement records to permit a thorough, comprehensive diagnosis for treatment planning are properly documented.

### **RADIOGRAPHIC PROCEDURES**

All candidates for limited orthodontic treatment must have a panoramic radiograph and periapical and bitewing films sufficient to determine general health, root form and position, periodontal status and developmental status of the dentition. Lateral or posterior-anterior cephalometric, or other films will be ordered as necessary to assess skeletal relationships in the appropriate planes of space.

## **Indications**

1. All developmental patients who are candidates for limited orthodontic treatment will have at minimum a panoramic film, anterior periapical radiographs and bitewing radiographs.
2. All information and interpretations are recorded on the 4-D form.
3. The health and morphologic variables of root form and position are properly determined.
4. Cephalometric films are accurately exposed with the patient in natural head posture. Landmarks and tracings should reveal that the morphologic basis of the patient's dentofacial relationships are accurately and comprehensively determined.

## **ANALYSIS OF DIAGNOSTIC, HAND-HELD, STUDY CASTS**

Properly trimmed hand-held study casts are required for all patients receiving limited orthodontic treatment. The casts facilitate a more in-depth analysis of the patient's occlusion, arch form and symmetry, alignment problems and tooth size. These are indicated for assessing space requirements and tooth size discrepancies (Bolton analysis).

## **Indications**

1. Patients receiving limited orthodontic treatment.

## **Contraindications**

None

## **Outcomes Assessment**

1. Impressions are accurate and undistorted, stored properly in 100% humidity with a wax occlusal registration in centric occlusion (maximum intercuspation) with additional wax registrations if there are occlusal discrepancies.
2. Impressions are poured as soon as possible, trimmed, and labeled to orthodontic specifications.
3. Casts are not distorted and accurate measurements are made. Analysis of casts produces a comprehensive data base for a thorough and accurate treatment plan.
4. All appropriate measures and interpretations will be included on the 4-D form.

## **TREATMENT PLANNING PROCEDURS**

Treatment planning in ORT 841 is based on developing a prioritized problem list in three planes of space along with an assessment of significant interacting factors that may influence treatment decisions and outcomes. Students will develop the problem list with possible solutions, determine the appropriate goals (long term) and objectives (sequence of treatment procedures in the short term) to reach the treatment goals. A biomechanical plan that includes the patient's chief complaint, consultations from other disciplines, anchorage requirements, force diagrams in all planes of space and a sequence of appointments to meet treatment objectives. Fees, limitations and risks, and retention requirements are also included for discussion during treatment planning. Treatment planning sessions are scheduled with an attending faculty member away from clinical activity to minimize distractions.

## **Indications**

1. All limited treatment must be treatment planned with a signed 4-D form.

### **Contraindications**

None

### **Outcomes Assessment**

1. The treatment plans have goals and objectives stated along with a description of risks and limitations, fees, estimated time for active treatment, retention needs, appointment sequence with mechanical plan, description of the appliance and force diagrams, and faculty signature.
2. Patients are informed of their treatment needs and understand clearly the limitations and risks of orthodontic treatment.
3. Students have a clear understanding of the goals and objectives of the treatment plan and have an in-depth understanding of appliance design and management for each appointment.
4. Treatment occurs in a timely manner and effective retention strategies are implemented.
5. The patient is satisfied with the results.

### **TREATMENT PROCEDURES FOR LIMITED ORTHODONTIC THERAPY**

Limited orthodontic treatment for ORT 841 typically refers to therapy that can be accomplished in 6- to 9-months. Force systems are usually restricted to tipping movements of the crown, but can occasionally involve some root movement with approval of the attending faculty. These requirements most commonly involve the correction of minor anterior alignment problems, uncomplicated molar uprighting, crown lengthening procedures, space regaining, and non-skeletal crossbites. Treatments may use fixed or removable appliances as indicated by force analysis, anchorage requirements and sometimes patient request.

### **ANTERIOR ALIGNMENT**

#### **Indications**

1. Misaligned anterior teeth with anterior crowding (no more than 2 to 3 mm), excess spacing (less than 3 mm), or minor rotations (less than 10 degrees) may be candidates for anterior alignment procedures. These may relate to repositioning teeth for esthetic purposes alone, or for correction of minor occlusal interferences, or for improvement of crown positions for esthetic crown restorations, or for abutment placement for fixed or removable prostheses.

#### **Contraindications**

1. Advanced, uncontrolled periodontal disease.
2. Untreated pulpal disease.
3. Severe underlying skeletal discrepancies.
4. Complicated root movements.
5. Root resorption, poor root formation.
6. Ankylosis.
7. Insufficient anchorage.
8. Uncontrolled habits.
9. Uncontrolled caries.
10. Other negative factors are poor oral hygiene, unrealistic patient expectations, poor prognosis for long term stability, uncontrolled or untreated systemic disease, and poor patient/parent motivation.

#### **Outcomes Assessment**

1. Improved alignment of anterior teeth that meets esthetic, functional, and restorative or periodontal treatment objectives.
2. Alignment objectives are met within the estimated time.
3. Minimal trauma to teeth and supporting structures.

4. Anchorage units are stable with minimum displacement.
5. Patient maintains acceptable oral hygiene and periodontal maintenance during treatment. Retention measures are in place.
6. Prognosis for additional dental treatment is good.
7. Patient is satisfied.

### **MOLAR UPRIGHTING**

The primary purpose of molar uprighting is to improve the axial inclination of a tipped molar that will serve as an abutment for a fixed or removable partial denture.

#### **Indications**

1. Tipped molar planned as an abutment tooth.
2. Eliminate unfavorable root proximity.
3. Eliminate or reduce periodontal pockets to enhance post treatment maintenance.

#### **Contraindications**

1. Advanced, uncontrolled periodontal disease.
2. Untreated pulpal disease.
3. Severe underlying skeletal discrepancies.
4. Complicated root movements.
5. Root resorption, poor root formation.
5. Ankylosis.
7. Insufficient anchorage.
8. Uncontrolled habits.
9. Uncontrolled caries.
10. Other negative factors are poor oral hygiene, unrealistic patient expectations, poor prognosis for long term stability, uncontrolled or untreated systemic disease, and poor patient/parent motivation.

#### **Outcomes Assessment**

1. Improvement of the axial inclination of a tipped molar to facilitate restorative and periodontal treatment and maintenance.
2. Treatment did not cause excess occlusal stress or cause significant vertical bite opening. (Frequent checks and occlusal adjustments are expected.)
3. Anchor units show minimal change, unless specific changes were planned.
4. Molar is uprighted to the desired position with minimal trauma to roots and supporting structures and with minimal occlusal interferences.
5. Treatment should be completed within an appropriate time interval and the prognosis for prosthetic treatment should be good.
6. Following active treatment, the uprighted molar is properly stabilized for a minimum of 6 weeks prior to abutment preparations.

### **FORCED ERUPTION PROCEDURES FOR CROWN LENGTHENING**

Forced tooth eruption is primarily an adjunctive procedure to create sufficient crown length to facilitate restorative and endodontic treatments. Additional gingival and alveolar bone recontouring may be required in order to establish level crestal bone and gingival margin height.

#### **Indications**

1. Fractured or carious tooth requiring additional crown height.

**Contraindications**

1. Unfavorable crown/root ration, uncontrolled periodontitis.
2. Untreatable pulpal disease.
3. Inadequate anchorage.
4. Poor root morphology.
5. Root resorption, root fracture.
6. Ankylosis.
7. Other negative factors are poor oral hygiene, active caries, poor patient compliance.
8. Unresolved systemic illness may also contraindicate orthodontic treatment.

**Outcomes Assessment**

1. Adequate extrusion of an unrestorable tooth to facilitate restorative and/or root canal treatment.
2. Minimal trauma to the tooth and supporting structures.
3. The tooth does not exhibit excessive mobility.
4. Minimal unwanted changes in the anchorage segments.
5. The tooth is stabilized for a minimum of 6 weeks prior to restorative treatment.

**SPACE REGAINING**

The most common indication is to regain space lost during the mixed dentition due to mesial drifting of the first permanent molar resulting from the premature loss of a second primary molar.

**Indications**

1. Mesial drifting of the first permanent molar.
2. Skeletal relationships should be Class I with a balanced soft tissue profile.

**Contraindications**

1. Underlying tooth size-arch size discrepancy.
2. Severe crowding and/or skeletal jaw discrepancies that require additional corrective measures.
3. Space loss greater than 3 mm.
4. Space loss associated with bodily tooth migration.
5. Poor patient compliance.
6. Poor oral hygiene.
7. Inadequate anchorage.

**Outcomes Assessment**

1. Normal molar occlusion with sufficient space for the erupting succedaneous tooth.
2. Adequate space maintenance to preserve tooth positions until gingival emergence occurs.

**NON-SKELETAL CROSSBITE CORRECTION****Indications**

1. Crossbites of dental origin that can be corrected by dental tipping forces.

**Contraindications**

1. Severe bilateral posterior crossbites and anterior crossbites in which there are dental compensations for Class III jaw relationships.
2. Poor patient compliance.
3. Poor oral hygiene.
4. Active disease states of the hard and soft oral tissues.

5. Unresolved oral habits.
6. Vertical malocclusions involving either an excessively deep bite or an anterior open bite tendency.

**Outcomes Assessment**

1. Correction of the crossbite within the estimated time with minimal tissue trauma.
2. Placement of appropriate retention for a minimum of 3 months.
3. Following retention the correction should exhibit some rebound but settle into a stable occlusion.
4. There should be no functional shifts.

## ORAL AND MAXILLOFACIAL SURGERY

### EXTRACTION OF AN ERUPTED TOOTH

#### Indications

1. Pulpitis or pulp necrosis.
2. Periodontal disease.
3. Periapical pathosis.
4. Nonrestorable tooth.
5. Infection/abscess.
6. Malpositioned tooth.
7. Extraction necessary for prosthetic treatment plan.
8. Extraction necessary for orthodontic treatment plan.
9. Tooth associated with pathologic lesion.
10. Supernumerary tooth.
11. Extraction related to or in conjunction with medical disease.
12. Patient refuses other therapy for financial or other reasons.

#### Factors affecting risk

1. Major coexisting disease or systemic conditions.
2. Psychological conditions or psychiatric diseases.
3. Patient age.
4. Patient (or escort or family) competence or ability to understand procedure, post-op instructions, etc.
5. Infection or other pathology.
6. Adjacent tooth (teeth).
7. Degree to which caries is present.
8. Size and density of alveolar bone.
9. History of endodontic treatment.
10. Relationship of tooth to vital structures (e.g. Maxillary sinus, inferior alveolar nerve).
11. Root anatomy.
12. Ability to gain access to the tooth.
13. Lack of patient compliance.

#### Outcomes Assessment

1. Absence of pain.
2. Absence of infection.
3. Uncomplicated healing of surgical site.
4. Restored function.
5. Complete hemostasis.
6. Removal of pathosis, if present.
7. Limited period of disability.

### TREATMENT OF ODONTOGENIC INFECTIONS, INCLUDING INCISION AND DRAINAGE

#### Indications

1. Symptoms: pain, swelling, trismus, chills, altered function, malaise, dysphagia.
2. Clinical findings: erythema, tissue induration, lymphadenopathy, purulence, fistula, fever.

3. Other findings: caries, periodontal bone loss, periapical pathosis, osteolytic area, abnormal results of blood count, positive culture or Gram stain.

#### **Factors affecting risk**

1. Presence of major coexisting disease or systemic condition(s).
2. Presence of psychological conditions or psychiatric diseases.
3. Patient age.
4. Patient (or escort or family) competence or ability to understand procedure, post-op instructions, etc.
5. Extent of infection.
6. Direction and/or rate of infection extension.
7. Virulence of microorganism.
8. Susceptibility of microorganism to antibiotics.
9. Ability to gain access to affected areas.
10. Relationship of infection to vital structures.
11. Root anatomy.
12. Ability to gain access to the tooth.
13. Lack of patient compliance.

#### **Outcomes Assessment**

1. Eliminate acute and/or chronic infection.
2. Limit pain.
3. Restore function.
4. Preserve vital structures.
5. Prevent recurrence.
6. Limit period of disability.

### **MODIFICATIONS OF THE DENTOALVEOLAR PROCESS (EG. TORUS REMOVAL, ALVEOLOPLASTY, SOFT TISSUE MODIFICATION, TUBerosITY REDUCTION)**

#### **Indications**

1. Clinical findings of dentoalveolar soft tissue or bone abnormality.
2. Infection, ulceration, and/or pain.
3. Speech abnormality.
4. Masticatory dysfunction.
5. Dysphagia.
6. Interference with prosthetic treatment.
7. Periodontal disease.

#### **Factors affecting risk**

1. Major coexisting disease or systemic conditions.
2. Psychological conditions or psychiatric diseases.
3. Patient age.
4. Patient (or escort or family) competence or ability to understand procedure, post-op instructions, etc.
5. Infection or other pathology.
6. Anatomical location, size, and extent of the abnormality.
7. Relationship of the abnormality to vital structures (e.g. Maxillary sinus, inferior alveolar nerve).
8. Quality of alveolar bone or soft tissue.
9. Ability to gain access to the surgical site.

10. Lack of patient compliance.

#### **Outcomes Assessment**

1. Adequate soft and hard tissue base for prosthetic reconstruction or rehabilitation.
2. Improved physiological condition of dentoalveolar structures.
3. Restoration, retention, and function of previously diseased tooth or teeth.
4. Improved mastication, speech, and/or appearance.
5. Pain relief.
6. Absence of infection.
7. Limited period of disability.
8. No unanticipated loss of hard or soft tissues.

#### **PRE-SURGICAL EVALUATION**

Pre-surgical evaluation is performed to assess the patient's chief complaint and medical history, and review systems, physical examination, and laboratory studies.

#### **Indications**

1. Presentation of a patient to the oral and maxillofacial surgery clinic for evaluation, diagnosis, care, and/or treatment.

#### **Factors affecting risk**

1. Incomplete initial assessment.
2. Communication barriers (e.g. Language, cultural, communication disorders, altered mental status or level of consciousness).
3. Patient's guardian's/responsible party's failure to disclose.
4. Physical barriers (e.g. trismus, obesity).
5. Psychological barriers.
6. Degree of patient compliance.
7. Other factors that would reduce the clinician's ability to make a complete, accurate diagnosis.

#### **Outcomes Assessment**

Achieving assessment goals resulting in adequate knowledge upon which to base a diagnosis, treatment plan, and/or to safely render treatment using either no anesthetic, local anesthesia, or conscious sedation.

#### **CONSCIOUS SEDATION, USING PARENTERAL AGENTS, NITROUS OXIDE, AND/OR ORAL MEDICATIONS**

#### **Indications**

1. Need to minimally depress the level of consciousness, anxiety, and/or pain so that the patient can undergo a procedure.
2. Need to retain the patient's ability to independently and continuously maintain an airway and respond to physical stimulation and verbal commands.

#### **Factors affecting risk**

1. Degree to which the patient and/or family understand the etiology and course of disease or condition, therapy goals, and acceptance of proposed treatment.
2. Major coexisting disease or systemic conditions.
3. Psychological conditions or psychiatric diseases.
4. Patient age.
5. Infection or other pathology.

6. Noncompliance with NPO recommendation.
7. History of drug allergies or sensitivities.
8. Psychological aversion to intravenous or intramuscular injections.
9. History of substance abuse.
10. History of untoward reactions or complications with anesthetics.
11. Lack of patient compliance.

#### **Outcomes Assessment**

1. Diminution or elimination of anxiety during therapeutic procedure.
2. Procedure completed.
3. Lack of unintended change in patient's level of consciousness.
4. Return to preanesthetic physiological and psychological state within 12 hours following cessation of anesthetic agent administration.
5. Anesthetic experience deemed satisfactory by both patient and clinician.
6. Lack of other complications or sequelae requiring follow up care related specifically to the anesthetic (e.g. phlebitis).

### **ENDOSSEOUS IMPLANTS**

#### **Indications**

11. tooth and/or root fracture
12. missing teeth due to trauma
13. previous extraction sites
14. spaces created by orthodontic movement
15. endodontic failures
16. restorative failures
17. extractions due to periodontal disease
18. non-restorable teeth due to caries (following extraction)
19. to avoid preparation of virgin teeth for bridge abutments
20. anchorage for orthodontic tooth movement

#### **Factors affecting risk**

1. Presence of bone and/or soft tissue infection or pathology.
2. Inadequate prosthetic or surgical treatment planning (Implant Consent and Treatment Planning Form (5D) not completed).
3. Inadequate bone quality and volume.
4. Psychological conditions or psychiatric diseases.
5. Patient age.
6. Patient (or escort or family) competence or ability to understand procedure, post-op instructions, etc.
7. Systemic conditions that may interfere with normal healing process.
8. Inadequate oral hygiene.
9. Patient age.
10. Proximity of implant placement site to adjacent structures (eg, teeth, maxillary sinus, inferior alveolar nerve).
11. Lack of patient compliance.

#### **Outcomes Assessment**

1. Retained, stable, functional implant.

2. No evidence of peri-implant radiolucency (See Implant Radiographic Guidelines in Clinic Manual).
3. Peri-implant soft tissue health.
4. Patient satisfaction with function, aesthetics, and ease of maintenance.
5. Limited period of pain and disability.
6. Patient (family) acceptance of procedure and understanding of outcomes.

## ORAL PATHOLOGY

### **SOFT TISSUE EXAMINATION**

All patients should receive a soft tissue examination of the oral cavity, tonsillar area and posterior pharyngeal wall, perioral tissue and upper neck. A dentist is also in a unique situation to observe the face which should be included in the visual examination.

This standard should apply to all new patients and recall patients after continuous dental treatment has been completed.

### **RADIOGRAPHIC EXAMINATION**

All patients should receive a radiographic examination of the teeth and jaws prior to comprehensive dental treatment. Recall patients should undergo radiographic examination in accordance with published standards for periodic radiographic examination and signs and symptoms of disease.

Patients presenting with signs and symptoms of a disease process related to teeth, bone and maxillary sinus must have radiographs taken to help with the diagnosis and to determine the extent of the process. In addition, radiographs may be needed in evaluating soft tissue disease processes.

### **SOFT TISSUE AND RADIOGRAPHIC ALTERATIONS/ABNORMALITIES**

All soft tissue and radiographic alterations from normal must be recognized, evaluated, diagnosed and managed appropriately. The diagnosis may require a variety of diagnostic tests and may require referral to additional health care providers. Management may be carried out by the original dentist or another health care provider.

### **TISSUE MANAGEMENT**

All tissue removed from patients in the College of Dentistry and allied clinics undergoes gross and/or microscopic examination and findings placed in the patient record. Guidelines for facilitating this process are as follows:

#### **A. Teeth with no attached soft or hard tissue and no abnormalities beyond caries**

Example: Uncomplicated carious tooth

A gross description of the tooth and reason for removal are included in the patient's progress notes by the attending dentist. The tooth is disposed of in compliance with human waste management standards.

#### **B. Teeth with no attached soft or hard tissue and with variations or abnormalities excluding caries**

Example: Dilaceration  
Concrescence

A gross description of the tooth, a diagnosis and reason for removal are included in the patient's progress notes by the attending dentist. The tooth is disposed of as in condition A.

#### **C. Teeth with no attached soft and hard tissue and with abnormalities excluding caries in which a specific diagnosis of the condition is required**

Example      Dentinogenesis imperfecta  
                  Dentinal dysplasia

The tooth is submitted to oral pathology for gross and microscopic examination.

**D. Teeth with no attached soft and hard tissue and no abnormalities in patients with unexplained symptoms associated with the teeth**

Example      Premature exfoliation of teeth

The tooth is submitted to oral pathology for gross and microscopic examination.

**E. Teeth with attached soft tissue**

In general, soft tissue is sent to oral pathology for gross and microscopic examination. An acceptable exclusion is the situation of an impacted tooth with pericoronal tissue interpreted clinically as dental follicle.

Criteria for what represents normal follicular tissue and what is pathology may not be clear-cut, but submission to an oral pathology laboratory for microscopic diagnosis should occur if any of the following is present:

1. A radiolucency of more than .4 cm.
2. A radiolucency that exhibits a sclerotic border.
3. A radiolucency that extends along the tooth root surface.
4. A focal increase in the size of the radiolucency.
5. A radiolucency that is associated with resorption of adjacent teeth.
6. A radiolucency that contains radiopacities.
7. Soft tissue lining a distinct cavity.
8. A cavity with luminal contents.
9. Luminal surface vegetations and growths.
10. Thickened lining.

A tooth with tissue interpreted as follicle receives a gross description which is entered in the patient's progress notes by the attending dentist. The tissue is disposed of as in A. However, the submission of normal follicular tissue for microscopic confirmation is totally acceptable.

Tissue required for submission to oral pathology includes periocoronal, periodontal and radicular pathology.

**F. Teeth with attached non-diseased bone**

Example      Traumatic extraction

A gross description of the tooth and bone, reason for removal and interpretation of the bone are included in the patient's progress notes by the attending dentist and the tissue is disposed of as in A.

**G. Bone specimens**

All diseased or abnormal bone is submitted for gross and microscopic examination. Acceptable exclusions include non-pathologic bone associated with tooth extraction and pre-prosthetic surgery.

## **H. Soft tissue**

All altered or diseased soft tissue is submitted for gross and microscopic examination. Acceptable exclusions are inflamed pulp, dental follicle as described in E and essentially normal tissue such as mucosa that is removed for treatment of impacted teeth and typical inflammatory periodontal disease.

Tissue removed from routine periodontal procedures may not be submitted for microscopic examination if the clinical and radiographic presentation follows the typical pattern of periodontal disease. A description of the tissue and reason for removal should be entered in the patient's progress notes by the attending dentist. The tissue should be disposed of as in A, but it is acceptable to submit this tissue for microscopic examination.

Tissue removed in the following situations must be submitted for microscopic examination:

1. Discrete enlargement of gingival soft tissue excluding routine gingivitis.
2. Gingivitis refractory to normal treatment.
3. Isolated alveolar bone defects.
4. Rapidly progressing alveolar bone loss.
5. Areas of exaggerated bone loss in chronic periodontitis.
6. Medical history indicating a systemic illness and/or cancer.
7. Signs and symptoms of a possible undiagnosed systemic illness.
8. Unexplained etiology.
9. Persistent active disease after appropriate therapy.