Attachment 22

DETAILED COURSE OUTLINE

Outline

DIDACTIC SESSION

8 Hours

1. Introduction
    a. The orthodontic specialty practice
    b. The orthodontic assistant
    c. The orthodontic office
    d. Key words and concepts
2. Facial and Dental Discrepancies
    a. Eruption and exfoliation of teeth
    b. Classification of malocclusions
    3. Review Tooth Morphology and Oral Anatomy
    a. Primary vs. adult
    b. Shape, color and size
    c. Common terminology for soft and hard tissues
4. Treatment Sequencing
    a. Diagnostic records
    b. Preventative Treatment
    c. Interceptive Treatment
    d. Comprehensive Treatment
5. Role of the Auxiliary
    a. Diagnostic records
    b. Patient treatment
    c. Patient education
    d. Appliance wear/care instruction
6. Dental Practice Act
    a. Scope of Practice
    b. Requirements for licensing
    c. DA, OAP Duties included and NOT included
7. Infection Control
    a. Basic Infection Control
    b. Cross contamination

WRITTEN FINAL EXAMINATION

1 Hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

Outline

DIDACTIC SESSION

2 Hours

1. Theory of Band Positioning and Tooth Movement
2. Orthodontic Band Composition
3. Techniques for Orthodontic Band Sizing, Fitting, Cementing & Removal including:
    a. Armamentaria
    b. General principles
    c. Normal placement of brackets, tubes, lingual sheaths, lingual cleats and buttons onto bands
4. Orthodontic Cements and Adhesive Materials
    a. Classifications
    b. Armamentaria
    c. Mixing technique
5. Cementing Bands
    a. Armamentaria
    b. Mixing techniques
    c. Cementation procedures
6. Removal of Bands after Cementation

LABORATORY SESSION 1

2 Hours

During this session, students will practice sizing, fitting and cementing orthodontic bands on typodont teeth using plain bands and bands with attachments.

LABORATORY SESSION 2

2 Hours

Laboratory practice on typodont teeth continues but now for different quadrants of the mouth and different tooth types including molars, bicuspids and anteriors. Students will become familiar with use of bite sticks in simulation, band pushers, mechanical band seaters and pluggers used for contouring. Additional time should be spent using the mechanical band seaters, as typodonts will not provide adequate pressure to seat bands on typodonts. During laboratory session 2 students will fit a minimum of two first molar bands on typodont teeth with the cementing and removal of one first molar band serving as a practical examination.

PRECLINICAL SESSION

4 Hours

Prior to preclinical session, student partners will place orthodontic separators mesial and distal of maxillary and one mandibular molar 3-4 days prior to the start of the session. During this session, student partners work on each other in simulation as described and demonstrated by instructor on day one. Working with a partner, each student functioning as the operator sizes, fits and cements orthodontic bands. Student will then function as an assistant to observe and evaluate placement with partner. Students will size, fit, and cement orthodontic bands to four first molar teeth with the cementing and removal of two first molar bands serving as a practical examination.

WRITTEN FINAL EXAMINATION

1 Hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

CLINICAL INSTRUCTION

8 Hours

During this session, the instructor will demonstrate the sequence for sizing, fitting and cementing an orthodontic band on active patients. Student experience on active patients will include sizing, fitting, and cementing of orthodontic bands after inspection by the orthodontist on two-four posterior teeth depending on patient needs on a minimum of two patients, with two of the cemented first molar bands used for a clinical exam.

Outline

DIDACTIC SESSION

4 Hours

1. Identifying Teeth with Orthodontic Bands
    a. Teeth most likely to have bands
    b. Differentiating bands from other orthodontic appliances
    c. Components of an orthodontic band and attachments
2. Removal of Orthodontic Bands
    a. Instruments used (armamentarium)
    b. Technique for removal of bands
3. Patient Safety and Comfort during Removal of Bands
    a. Explain the procedure and patient experience
    b. Prevention of swallowing/aspiration
    c. Special care for soft and hard tissues
4. Special Circumstances
    a. Crowns, fillings, possibility of fracture or damage
    b. Inflamed tissue
    c. Patients with limited opening
5. Identifying residual cement
    a. Types of band cement
    b. Differentiating from stain/discoloration
    c. Identifying decalcification or white spots and proper action to take
    d. Factors influencing amount of residual cement (etched teeth, bands)
    e. Likely places to find residual cement (band space, interproximal areas, etc.)
6. Supragingival removal of residual cement with a hand instrument
    a. Instruments used (armamentarium)
    b. Technique for removal of residual cement
7. Patient safety and comfort during removal of cement
    a. Prevention of swallowing/aspiration (use of suction)
    b. Special care for soft and hard tissues
    c. Patient home care instruction to reduce inflammation and hypertrophy

LABORATORY SESSION

2 Hours

During this session, students will practice the removal of orthodontic bands as well as the techniques for removal of cement with a hand instrument on a typodont.

PRECLINICAL SESSION

2 Hours

During this session, students will practice the removal of orthodontic bands as well as the techniques for removal of cement with a hand instrument on each other after bands were cemented in the second module. Students will work with a partner during the process of these procedures; the assisting student will observe each stage of the process for evaluation.

WRITTEN FINAL EXAMINATION

1 Hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

CLINICAL INSTRUCTION

4 Hours

During this session, the students will participate in the removal of excess cement supra gingivally from orthodontic bands with a hand instrument on at least two active patients.

Outline

DIDACTIC SESSION

4 Hours

1. Understanding the Factors for Bonding Success
2. General Concepts in Bonding to Enamel Surfaces
3. Armamentarium
4. Patient Assessment and Education
5. Cleaning Tooth Surfaces
6. Isolation and Moisture Control
7. Acid Etching
8. Acid Etch Removal
9. Rinsing Tooth Surfaces
10. Drying Tooth Surfaces
11. Application of Bonding Primers and Resins
12. Bonding to Enamel vs. Restorative Materials

LABORATORY SESSION – 1

1 Hour

During this session, students will practice the preparation of teeth for bonding with the application materials on typodont teeth using appropriate etchants/primers according to type of enamel or restorative material simulated to be bonded. Students will practice procedures and product applications on a minimum of four typodont teeth for each assigned tooth materials to include enamel, porcelain and plastic tooth materials.

LABORATORY SESSION – 2

1 Hour

Laboratory practice on typodont teeth continues, including specialized products used for bonding atypical enamel, porcelain, plastic, gold etc. and practice protocol for contaminated teeth and indirect bonding. Students will practice applications on a minimum of four typodont teeth for each assigned tooth material to include enamel, porcelain, and plastic tooth materials with one serving as a practical examination.

PRECLINICAL SESSION

2 Hours

During this session, students will practice the preparation of teeth for bonding working on each other in simulation. Taking turns, each student functions as an operator and applies etchant (faux) and bonding materials on four posterior and four anterior teeth with one procedure used as a practical examination.

WRITTEN FINAL EXAMINATION

1 Hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

CLINICAL INSTRUCTION

4 Hours

During this session, the instructor will demonstrate the sequence of tooth preparation for bonding on active patients.

Outline

DIDACTIC SESSION

4 Hours

1. Bracket Design and Bracket-Archwire Interaction
2. Bracket Placement Criteria
3. Bonding Material Characteristics, Application Techniques and Curing Time Factors
4. Armamentaria for Bracket Placement
5. Procedures for Direct Bracket Bonding with Different Materials
6. Rationale for Indirect Bracket Bonding
7. Armamentaria for Indirect Bracket Placement
8. Procedure for Indirect Bracket Bonding
9. Bracket Removal Considerations
10. Armamentaria for Bracket Removal
11. Procedures for Bracket or Tube Removal

LABORATORY SESSION 1

2 Hours

During this session, students will practice the selection, preparation of brackets, etching, prepositioning, final positioning by orthodontist and bracket removal on typodont teeth. Students will work with a partner during the process of these procedures; the assisting student will observe each state of the process for evaluation. Students will load brackets and position on a minimum of four anterior and four posterior typodont teeth, with one of each of the four times used for a practical exam.

LABORATORY SESSION 2

2 Hours

Laboratory practice on typodont teeth continues, but now for specialized techniques for direct and indirect bonding with review of considerations for products used for bonding atypical enamel, porcelain, plastic, gold etc. and practice protocol for contaminated teeth. Students working in pairs will select, etch and place orthodontic brackets followed by inspection by the orthodontist and then bracket removal. Students will practice applications on a minimum of four typodont teeth for each assigned tooth material to include enamel, porcelain, and plastic tooth materials with one serving as a practical examination.

WRITTEN FINAL EXAMINATION

1 Hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

CLINICAL INSTRUCTION

4 Hours

During this session, the instructor will demonstrate the sequence of tooth preparation for bonding on active patients. Student experience on active patients will include bracket bonding on four anterior and four posterior teeth a minimum of four times each, with one of each of the four times used for a practical exam and removal of brackets on four anterior and four posterior teeth a minimum of four times each, with one of each of the four times used for a practical exam.

Outline

DIDACTIC SESSION

2 Hours

1. Archwire Characteristics
    a. Alloy types
    b. Shapes
    c. Dimensions
    d. Forces
2. Armamentaria
3. Procedures for Placement
4. Ligature Systems

LABORATORY SESSION 1

4 Hours

During this session, students will practice the insertion of a preformed maxillary and mandibular archwire and ligation using elastic or metal ligatures or self-ligating brackets on typodont teeth. Students will work with a partner during the process of these procedures; the assisting student will observe each state of the process for evaluation. Students will practice each skill a minimum of four times per arch with one of each of the four times used for a practical exam.

LABORATORY SESSION 2

2 Hours

During this session, students continue to practice the insertion of a preformed maxillary and mandibular archwire and ligation using elastic or metal ligatures or self-ligating brackets on typodont teeth. Students will work with a partner during the process of these procedures; the assisting student will observe each state of the process for evaluation. Students will practice each skill a minimum of four times per arch with one of each of the four times used for a practical exam.

WRITTEN FINAL EXAMINATION

1 Hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

CLINICAL INSTRUCTION

8 Hours

During this session, the student will practice inserting a preformed maxillary and mandibular archwire and ligating archwires using a combination of elastic and metal ligatures or self-ligating brackets on at least two active patients, with one patient's maxillary and mandibular archwire placement used as a clinical examination.

Outline

Didactic and laboratory instruction will emphasize developing the student's ability to perform all the proper techniques for removal of excess cement from orthodontically banded teeth with competence. Lecture on manipulation and care of ultrasonic scaler, indications versus contraindications, effects of ultrasonic scalers on hard and soft tissue including root damage, enamel damage, thermal damage and soft tissue damage as well as safety in regards to patient with systemic medical complications and managing patients with pacemakers. In addition to ultrasonic basics criteria, use of instruments and fulcruming techniques, infection control protocols in relation to removal of excess cement using an ultrasonic scaler, use of PPE and instrument processing.

DIDACTIC SESSION

2 Hours

1. Introduction to Ultrasonic Scaling
    a. Review of OSHA Infection Control Protocol and Dental Board Regulations
    b. Review of Laboratory and Clinical Training Site Emergency Protocol
    c. Patient Requirements for Clinical Practice at Dental Facility
    d. Examination Requirements
    e. Procedures for Handling Dental Patients during Clinical Practice
    f. Supplies and Equipment Use
    g. Demonstration of Equipment
2. Proper Use and Care of Ultrasonic Cleaning Device
3. Infection Control During Ultrasonic Scaling for Cement Removal
4. Techniques and Use of Equipment
    a. Operator/patient positioning
    b. Device grasp
    c. Device types
5. Patient Health
    a. Indications and contraindications
    b. Health history
6. Procedure Outline

LABORATORY SESSION

4 Hours

During this session, students will practice ultrasonic scaler use in the removal of orthodontic cement from around bands and/or brackets on typodont teeth. Instructor will describe and demonstrate the following: criteria for ideal use of the ultrasonic scaler with appropriate selection and adaptation of tips, use of a fulcrum, operator/patient positioning, worksheet, product evaluation forms. Students will work with a partner during the process of these procedures; the assisting student will observe each state of the process for evaluation. Student, partner and instructor will evaluate all laboratory practice using stated criteria, worksheet and product evaluation sheets.

PRECLINICAL SESSION

4 Hours

During this session, students will continue practice of the use of the ultrasonic for removal of orthodontic cement on a minimum of four banded posterior first molars.

WRITTEN FINAL EXAMINATION

1 hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

CLINICAL SESSION

4 Hours

Working with a partner, each student functions as operator using an ultrasonic scaler to remove orthodontic cement from four posterior first molars on a minimum of two patients. Student will function as an assistant and will observe and evaluate ultrasonic use in removal of cement with a partner.

Orientation

Outline

1. Description of course
2. Review Dental Board of California Infection Control Regulations as it applies to orthodontic practice. See California Code of Regulations Title 16 Section 1005 – Minimum Standards for Infection Control included as a supplement for this orientation.
3. Review of laboratory and clinical training site emergency protocol
4. Patient requirements/criteria for clinical requirements at dental facility
5. Examination requirements
6. Procedures for handling dental patients during clinical practice
7. Supplies/equipment use
8. Demonstration of equipment within facility

Dental Board of California Infection Control Regulations

CALIFORNIA CODE OF REGULATIONS TITLE 16 SECTION 1005

California Code of Regulations Title 16 §1005.
Minimum Standards for Infection Control

a. Definitions of terms used in this section:

1. "Standard precautions" are a group of infection prevention practices that apply to all patients, regardless of suspected or confirmed infection status, in any setting in which healthcare is delivered. These include hand hygiene, use of gloves, gown, mask, eye protection, or face shield, depending on the anticipated exposure, and safe handling of sharps. Standard precautions shall be used for care of all patients regardless of their diagnoses or personal infectious status.
2. "Critical items" confer a high risk for infection if they are contaminated with any microorganism. These include all instruments, devices, and other items used to penetrate soft tissue or bone.
3. "Semi-critical items" are instruments, devices and other items that are not used to penetrate soft tissue or bone, but contact oral mucous membranes, non-intact skin or other potentially infectious materials (OPIM).
4. "Non-critical items" are instruments, devices, equipment, and surfaces that come in contact with soil, debris, saliva, blood, OPIM and intact skin, but not oral mucous membranes.
5. "Low-level disinfection" is the least effective disinfection process. It kills some bacteria, some viruses and fungi, but does not kill bacterial spores or mycobacterium tuberculosis var bovis, a laboratory test organism used to classify the strength of disinfectant chemicals.
6. "Intermediate-level disinfection" kills mycobacterium tuberculosis var bovis indicating that many human pathogens are also killed. This process does not necessarily kill spores.
7. "High-level disinfection" kills some, but not necessarily all bacterial spores. This process kills mycobacterium tuberculosis var bovis, bacteria, fungi, and viruses.
8. "Germicide" is a chemical agent that can be used to disinfect items and surfaces based on the level of contamination.
9. "Sterilization" is a validated process used to render a product free of all forms of viable microorganisms.
10. "Cleaning" is the removal of visible soil (e.g., organic and inorganic material) debris and OPIM from objects and surfaces and shall be accomplished manually or mechanically using water with detergents or enzymatic products.
11. "Personal Protective Equipment" (PPE) is specialized clothing or equipment worn or used for protection against a hazard. PPE items may include, but are not limited to, gloves, masks, respiratory devices, protective eyewear and protective attire which are intended to prevent exposure to blood, body fluids, and OPIM, and chemicals used for infection control. General work attire such as uniforms, scrubs, pants and shirts, are not considered to be PPE.
12. "Other Potentially Infectious Materials" (OPIM) means any one of the following:
    A. Human body fluids such as saliva in dental procedures and any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids.
    B. Any unfixed tissue or organ (other than intact skin) from a human (living or dead).
    C. Any of the following, if known or reasonably likely to contain or be infected with HIV, HBV, or HCV:
        1. Cell, tissue, or organ cultures from humans or experimental animals;
        2. Blood, organs, or other tissues from experimental animals; or
        3. culture medium or other solutions.
13. "Dental Healthcare Personnel" (DHCP) are all paid and non-paid personnel in the dental health-care setting who might be occupationally exposed to infectious materials, including body substances and contaminated supplies, equipment, environmental surfaces, water, or air. DHCP includes dentists, dental hygienists, dental assistants, dental laboratory technicians (in-office and commercial), students and trainees, contractual personnel, and other persons not directly involved in patient care but potentially exposed to infectious agents (e.g., administrative, clerical, housekeeping, maintenance or volunteer personnel).

b. All DHCP shall comply with infection control precautions and enforce the following minimum precautions to minimize the transmission of pathogens in health care settings mandated by the California Division of Occupational Safety and Health (Cal/OSHA).

1. Standard precautions shall be practiced in the care of all patients.
2. A written protocol shall be developed, maintained, and periodically updated for proper instrument processing, operatory cleanliness, and management of injuries. The protocol shall be made available to all DHCP at the dental office.
3. A copy of this regulation shall be conspicuously posted in each dental office.

Personal Protective Equipment:

4. All DHCP shall wear surgical facemasks in combination with either chin length plastic face shields or protective eyewear whenever there is potential for aerosol spray, splashing or spattering of the following: droplet nuclei, blood, chemical or germicidal agents or OPIM. Chemical-resistant utility gloves and appropriate, task specific PPE shall be worn when handling hazardous chemicals. After each patient treatment, masks shall be changed and disposed. After each patient treatment, face shields and protective eyewear shall be cleaned, disinfected, or disposed.
5. Protective attire shall be worn for disinfection, sterilization, and housekeeping procedures involving the use of germicides or handling contaminated items. All DHCP shall wear reusable or disposable protective attire whenever there is a potential for aerosol spray, splashing or spattering of blood, OPIM, or chemicals and germicidal agents. Protective attire must be changed daily or between patients if they should become moist or visibly soiled. All PPE used during patient care shall be removed when leaving laboratories or areas of patient care activities. Reusable gowns shall be laundered in accordance with Cal/OSHA Bloodborne Pathogens Standards (Title 8, Cal. Code Regs., section 5193).

Hand Hygiene:

6. All DHCP shall thoroughly wash their hands with soap and water at the start and end of each workday. DHCP shall wash contaminated or visibly soiled hands with soap and water and put on new gloves before treating each patient. If hands are not visibly soiled or contaminated an alcohol based hand rub may be used as an alternative to soap and water. Hands shall be thoroughly dried before donning gloves in order to prevent promotion of bacterial growth and washed again immediately after glove removal. A DHCP shall refrain from providing direct patient care if hand conditions are present that may render DHCP or patients more susceptible to opportunistic infection or exposure.
7. All DHCP who have exudative lesions or weeping dermatitis of the hand shall refrain from all direct patient care and from handling patient care equipment until the condition resolves.

Gloves:

8. Medical exam gloves shall be worn whenever there is contact with mucous membranes, blood, OPIM, and during all pre-clinical, clinical, post-clinical, and laboratory procedures. When processing contaminated sharp instruments, needles and devices, DHCP shall wear heavy-duty utility gloves to prevent puncture wounds. Gloves must be discarded when torn or punctured, upon completion of treatment, and before leaving laboratories or areas of patient care activities. All DHCP shall perform hand hygiene procedures before donning gloves and after removing and discarding gloves. Gloves shall not be washed before or after use.

Needle and Sharps Safety:

9. Needles shall be recapped only by using the scoop technique or a protective device. Needles shall not be bent or broken for the purpose of disposal. Disposable needles, syringes, scalpel blades, or other sharp items and instruments shall be placed into sharps containers for disposal as close as possible to the point of use according to all applicable local, state, and federal regulations.

Sterilization and Disinfection:

10. All germicides must be used in accordance with intended use and label instructions.
11. Cleaning must precede any disinfection or sterilization process. Products used to clean items or surfaces prior to disinfection procedures shall be used according to all label instructions.
12. Critical instruments, items and devices shall be discarded or pre-cleaned, packaged or wrapped and sterilized after each use. Methods of sterilization shall include steam under pressure (autoclaving), chemical vapor, and dry heat. If a critical item is heat-sensitive, it shall, at a minimum, be processed with high-level disinfection and packaged or wrapped upon completion of the disinfection process. These instruments, items, and devices, shall remain sealed and stored in a manner so as to prevent contamination, and shall be labeled with the date of sterilization and the specific sterilizer used if more than one sterilizer is utilized in the facility.

13. Semi-critical instruments, items, and devices shall be pre-cleaned, packaged or wrapped and sterilized after each use. Methods of sterilization include steam under pressure (autoclaving), chemical vapor and dry heat. If a semi-critical item is heat sensitive, it shall, at minimum, be processed with high level disinfection and packaged or wrapped upon completion of the disinfection process. These packages or containers shall remain sealed and shall be stored in a manner so as to prevent contamination, and shall be labeled with the date of sterilization and the specific sterilizer used if more than one sterilizer is utilized in the facility.
14. Non-critical surfaces and patient care items shall be cleaned and disinfected with a California Environmental Protection Agency (Cal/EPA)-registered hospital disinfectant (low-level disinfectant) labeled effective against HBV and HIV. When the item is visibly contaminated with blood or OPIM, a Cal/EPA-registered hospital intermediate-level disinfectant with a tuberculocidal claim shall be used.
15. All high-speed dental hand pieces, low-speed hand pieces, rotary components, and dental unit attachments such as reusable air/water syringe tips and ultrasonic scaler tips, shall be packaged, labeled and heat-sterilized in a manner consistent with the same sterilization practices as a semi-critical item.
16. Single use disposable items such as prophylaxis angles, prophylaxis cups and brushes, tips for high-speed evacuators, saliva ejectors, air/water syringe tips, and gloves shall be used for one patient only and discarded.
17. Proper functioning of the sterilization cycle of all sterilization devices shall be verified at least weekly through the use of a biological indicator (such as a spore test). Test results shall be documented and maintained for 12 months.

Irrigation:

18. Sterile coolants/irrigants shall be used for surgical procedures involving soft tissue or bone. Sterile coolants/irrigants must be delivered using a sterile delivery system.

Facilities:

19. If non-critical items or surfaces likely to be contaminated are manufactured in a manner preventing cleaning and disinfection, they shall be protected with disposable impervious barriers. Disposable barriers shall be changed when visibly soiled or damaged and between patients.
20. Clean and disinfect all clinical contact surfaces that are not protected by impervious barriers using a California Environmental Protection Agency (Cal-EPA) registered, hospital grade low- to intermediate-level germicide after each patient. The low-level disinfectants used shall be labeled effective against HBV and HIV. Use disinfectants in accordance with the manufacturer's instructions. Clean all housekeeping surfaces (e.g. floors, walls, sinks) with a detergent and water or a Cal-EPA registered, hospital grade disinfectant. Products used to clean items or surfaces prior to disinfection procedures shall be clearly labeled and DHCP shall follow all material safety data sheet (MSDS) handling and storage instructions.
21. Dental unit water lines shall be anti-retractive. At the beginning of each workday, dental unit lines and devices shall be purged with air or flushed with water for at least two (2) minutes prior to attaching handpieces, scalers, air water syringe tips, or other devices. The dental unit lines and devices shall be flushed between each patient for a minimum of twenty (20) seconds.
22. Contaminated solid waste shall be disposed of according to applicable local, state, and federal environmental standards.

Lab Areas:

23. Splash shields and equipment guards shall be used on dental laboratory lathes. Fresh pumice and a sterilized or new rag-wheel shall be used for each patient. Devices used to polish, trim, or adjust contaminated intraoral devices shall be disinfected or sterilized, properly packaged or wrapped and labeled with the date and the specific sterilizer used if more than one sterilizer is utilized in the facility. If packaging is compromised, the instruments shall be recleaned, packaged in a new wrap, and sterilized again. Sterilized items will be stored in a manner so as to prevent contamination.
24. All intraoral items such as impressions, bite registrations, prosthetic and orthodontic appliances shall be cleaned and disinfected with an intermediate-level disinfectant before manipulation in the laboratory and before placement in the patient's mouth. Such items shall be thoroughly rinsed prior to placement in the patient's mouth.

c. The Dental Board of California and the Dental Hygiene Committee of California shall review this regulation annually and establish a consensus.

Note: Authority cited: Section 1614, Business and Professions Code. Reference: Section 1680, Business and Professions Code.

HISTORY

1. New section filed 6-29-94; operative 7-29-94 (Register 94, No. 26).
2. Repealer and new section filed 7-8-96; operative 8-7-96 (Register 96, No. 28).
3. Repealer of subsection (a)(5) and subsection renumbering, amendment of subsections (b)(7), (b)(10), (b)(18)-(19) and (b)(23) and repealer of subsection (c) and subsection relettering filed 10-23-97; operative 11-22-97 (Register 97, No. 43).
4. Change without regulatory effect amending subsection (b)(4) filed 12-7-98 pursuant to section 100, title 1, California Code of Regulations (Register 98, No. 50).
5. Amendment of subsections (b)(11), (b)(13) and (b)(15) filed 6-30-99; operative 7-30-99 (Register 99, No. 27).
6. Amendment filed 3-1-2005; operative 3-31-2005 (Register 2005, No. 9). 9.
7. Amendment operative 8-20-2011.

Module 1

Introduction to Orthodontic Practice

By: BJ Runquist

PERFORMANCE OBJECTIVES

After completing the didactic study in Introduction to Orthodontic Practice, students will be able to:

1. Demonstrate a basic understanding of orthodontic procedures including the necessary armamentarium and the role of the dental assistant
2. Describe the role of the auxiliary in patient treatment and patient education
3. Demonstrate patient instruction in appliance wear/care
4. Describe the design of a typical orthodontic practice
5. Define, spell and pronounce key words and concepts
6. Demonstrate general knowledge of eruption and exfoliation of teeth
7. Identify and classify the different types of malocclusion
8. Describe a habit and its effect on the dentition
9. Discuss the biggest differences between adult and adolescent treatment.
10. Differentiate between interceptive and corrective phases of orthodontic treatment
11. Describe the types of diagnostic records used in orthodontic treatment planning
12. Demonstrate knowledge of the OAP scope of practice guidelines within the California Dental Practice Act

Outline

DIDACTIC SESSION

8 Hours

1. Introduction
    a. The orthodontic specialty practice
    b. The orthodontic assistant
    c. The orthodontic office
    d. Key words and concepts
2. Facial and Dental Discrepancies
    a. Eruption and exfoliation of teeth
    b. Classification of malocclusions
    3. Review Tooth Morphology and Oral Anatomy
    a. Primary vs. adult
    b. Shape, color and size
    c. Common terminology for soft and hard tissues
4. Treatment Sequencing
    a. Diagnostic records
    b. Preventative Treatment
    c. Interceptive Treatment
    d. Comprehensive Treatment
5. Role of the Auxiliary
    a. Diagnostic records
    b. Patient treatment
    c. Patient education
    d. Appliance wear/care instruction
6. Dental Practice Act
    a. Scope of Practice
    b. Requirements for licensing
    c. DA, OAP Duties included and NOT included
7. Infection Control
    a. Basic Infection Control
    b. Cross contamination

WRITTEN FINAL EXAMINATION

1 Hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

Written Examination

1. Orthodontics is the specialty of dentistry that involves
   a. Diagnosis
   b. Prevention
   c. Treatment of dental and facial irregularities
   d. a and b
   e. a, b and c
2. The orthodontist's primary role is the correction of malocclusion.
   a. True
   b. False
3. Horizontal overlap of the incisor teeth is referred to as:
   a. Deep overbite
   b. Over jet
   c. Overbite
4. Dr. Edward Angle in 1899 introduced a classification of malocclusion. It includes Class I, Class II Division III and Class III.
   a. Both statements are true
   b. The first statement is false and the second is true
   c. Both statements are false
   d. The first statement is true and the second is false
5. Dental irregularities found within a dental arch may include:
   a. Crowding
   b. Spacing
   c. Deep overbite
   d. a and c only
   e. a and b
6. Class III malocclusion is defined as retrognathic. The mandible has a mesial relationship with the maxilla.
   a. Both statements are true
   b. The first statement is false and the second is true
   c. Both statements are false
   d. The first statement is true and the second is false
7. The American Association of Orthodontists has recommended that a child's first visit to the orthodontist take place at ___ years of age.
   a. Five
   b. Six
   c. Seven
   d. Eight
   e. None of the above
8. Two major causes of malocclusion are genetic and environmental. The most common cause of malocclusion is heredity.
   a. Both statements are true
   b. Both statements are false
   c. The first statement is true the second is false
   d. The first statement is false and the second is true
9. Crossbite may occur on just one side or both sides of the mouth. It may involve one tooth or several teeth.
   a. The first statement is true and the second is false
   b. The first statement is false and the second is true
   c. Both statements are false
   d. Both statements are true

Match the following:

10. Interceptive treatment _____
11. Corrective treatment _____
12. Functional appliances _____
13. Fixed appliance _____
    a. Occurs at various stages of dentition development
    b. Heads off certain problems before negative effects
    c. The most common treatment modality in adolescent group
    d. Removable device used during corrective treatment
14. Orthodontic Records include the following:
    a. Medical history and dental history
    b. Clinical examination and study models
    c. Panoramic and Cephalometric radiographs
    d. a and c
    e. a, b and c

15. High sugar foods do not need to be avoided during orthodontic treatment.
    a. True
    b. False
16. A space maintainer
    a. Is an example of corrective therapy
    b. Used when a primary tooth is lost prematurely
    c. Prevents drifting of adjacent teeth into an edentulous area
    d. b and c
17. Which of the following is not true regarding oral hygiene practices for the orthodontic patient?
    a. Plaque must be removed more frequently
    b. Brushing around bands and brackets requires additional time and specialized oral health aids
    c. A critical area to brush is between the bracket and gingival margin
    d. Flossing is not an important part of daily home care
18. Discrepancies of occlusion often affect the short-term health of the dentition and surrounding oral tissues. TMJ can result from untreated malocclusions due to stress on the jaw muscles and joints.
    a. Both statements are true
    b. Both statements are false
    c. The first statement is false the second is true
    d. The first statement is true and the second is false
19. Open bites never occur in the posterior region of the mouth
    a. True
    b. False
20. In general, most orthodontic problems are due to:
    a. Environmental influences
    b. Developmental influences
    c. Genetic influences
    d. All of the above
21. Developmental disturbances include:
    a. Congenitally missing teeth
    b. Supernumerary teeth
    c. Malformed teeth
    d. All of the above

Match the following:

22. Malocclusion _____
23. Distoclusion _____
24. Mesiocclusion _____
    a. Deviated from a ideal normal occlusion
    b. Term used for Class III malocclusion
    c. Term used for Class II malocclusion
25. The most common radiograph taken for the orthodontic patient is the:
    a. FMX
    b. Bitewing
    c. Cephalometric
26. The orthodontist works very closely with the:
    a. Periodontist
    b. General dentist
    c. The Pedodontist
    d. The Prosthodontist
    e. b and c
    f. All the Above

Match the following:

27. Anterior tongue thrust _____
28. Lateral tongue thrust _____
29. Fan tongue thrust _____
    a. The tongue thrusts out at the occlusal surfaces
    b. Pressure of tongue causes bite to open—prevents permanent teeth from erupting
    c. Tongue rests on lingual surfaces of maxillary teeth—pressure causes teeth to move forward.

Match the following terms:

30. Band _____
31. Braces _____
32. Bracket _____
33. Headgear _____
34. Ligature tie _____
35. Retainer _____

    a. A small device bonded to teeth to hold the archwire to the teeth

    b. Stainless steel ring attached to teeth, holds archwire to teeth (molars and bicuspids)

    c. Light wire used to hold the archwire to bracket

    d. An appliance used to retain teeth in desired position

    e. Another term for fixed orthodontic appliances

    f. An external orthodontic appliance that is used to alter growth and tooth movement

36. Fetal Molding occurs after a baby is born. Fetal molding can alter the shape of the jaws.

    a. First statement is true, the second is true and the third is false.

    b. Both statements are true

    c. Both statements are false

    d. The first statement is false, the second statement is true

37. Habits can contribute to malalignment. Contributing factors may include sucking the thumb, tongue, or lip. These habits have long-term effects beyond the mixed dentition.

    a. First statement is true, the second is true and the third is false.

    b. All three statements are true

    c. All three statements are false

    d. The first statement is false, the second is false and the third is true.

38. The permanent mandibular second molars are the key to Dr. Angle's classification system for occlusion and malocclusion

    a. True

    b. False

39. The tooth numbering system used most often in dentistry in the United States is:

    a. Palmer notation system

    b. Universal numbering system

    c. Federation Dentaire Internationale system

40. In the universal numbering system the teeth are numbered 1 to 32 starting at the lower right quadrant.

    a. True

    b. False

41. Diseases can be transmitted in the dental office in a variety of ways

    a. Patient to patient

    b. Patient to dental team member

    c. Dental team to patient

    d. All of the above

42. CDC and OSHA are federal agencies that play a very important role in infection control for dental offices. CDC issues specific recommendations and OSHA is a regulatory agency that issues specific standards to protect the health of employees in the United States. The dental assistant should follow all of the guidelines and recommendations.

    a. The statements above are all true

    b. The statements above are all false

    c. The first and second statements are true the third is false

    d. The first two statements are false and the third is true.

43. The agency responsible for issuing guidelines for infection control in dental health care settings is:

    a. OSHA

    b. CDC

    c. Health and Human Services

44. The agency responsible for Bloodborne Pathogens Standard is

    a. CDC

    b. Health and Human Services

    c. OSHA

45. The concept that all human blood and body fluids, saliva included are to be treated as if they are known to be infectious is termed:
    a. Normal precautions
    b. Universal precautions
    c. Standard precautions
    d. Usual precautions
46. Dental personnel should wash their hands
    a. Before and after each patient
    b. Before placing latex gloves
    c. After removal of latex gloves
    d. If the integrity of the gloves is in question during a procedure, gloves are removed, hands are washed and new gloves are placed
    e. All of the above
47. Infection control measures that can prevent disease transmission include
    a. nstrument sterilization
    b. Surface barriers
    c. Hand washing
    d. Use of gloves, masks, glasses and immunization
    d. Pre-procedural mouth rinses for patients
    f. All of the above
48. Dental impressions should be disinfected as soon as possible upon removal from the patent's mouth.
    a. True
    b. False
49. Contaminated waste that has had contact with blood or other body fluids is disposed of in the general waste.
    a. True
    b. False
50. Infectious waste is contaminated waste that is capable of transmitting disease that includes sharps, blood, and blood-soaked materials.
    a. True
    b. False

Written Examination Answer Key

1. e
2. a
3. b
4. d
5. e
6. b
7. c
8. a
9. d
10. b
11. a
12. d
13. c
14. e
15. b
16. d
17. d
18. c
19. b
20. d
21. d
22. a
23. c
24. b
25. c
26. f
27. c
28. b
29. a
30. c
31. f
32. b
33. g
34. d
35. e
36. d
37. c
38. b
39. b
40. b
41. d
42. a
43. b
44. c
45. b
46. e
47. f
48. a
49. b
50. a

Module 2

Orthodontic Banding

SIZING, FITTING, CEMENTING AND REMOVING ORTHODONTIC BANDS

By: Michael Payne

PERFORMANCE OBJECTIVES

After completing the following areas of didactic, laboratory, and clinical instruction in sizing, fitting and cementing orthodontic bands the student will be able to:

1. List and explain the function of each component of the armamentaria required for sizing, fitting and cementing orthodontic bands
2. Define the proper sequential steps in the procedure of sizing, fitting, and cementing orthodontic bands
3. Explain basic concepts of cements, including characteristics, composition, storage and handling protocol of cementing materials
4. Identify the problem-solving techniques associated with the cements
5. List the major factors that are associated with cement failure and how to avoid them
6. Explain the principles of proper moisture control protocol used for cementing orthodontic bands while practicing patient management and maintaining a dry field
7. Identify the steps for appropriate infection control protocol for the operator and the dental operatory. List the protocol for barrier placement, surface disinfection and sterilization as it relates to cementing orthodontic bands according to OSHA and DBC
8. Identify factors that may cause a health hazard to the operator by viewing a MSDS sheet and know preventive measures that should be employed

On typodont teeth and patients the student will be able to:

1. Assemble appropriate armamentaria for sizing, fitting and cementing orthodontic bands
2. Select and fit orthodontic bands for a maxillary and mandibular molar
3. Properly contour the orthodontic band to the tooth
4. Remove the band in preparation of cementation
5. Rinse, dry and load band with cement
6. Isolate and dry quadrant in preparation for band cementation
7. Position and seat orthodontic band
8. Remove excess cement from tooth
9. Perform final curing if using light cure cement
10. Evaluate product using ideal criteria with 75% accuracy
11. Provide appropriate patient education
12. Maintain appropriate infection control throughout all procedures
13. Protect her/him and the patient from any hazardous situations as defined in the MSDS forms for any cement materials used

Outline

DIDACTIC SESSION

2 Hours

1. Theory of Band Positioning and Tooth Movement
2. Orthodontic Band Composition
3. Techniques for Orthodontic Band Sizing, Fitting, Cementing & Removal including:
    a. Armamentaria
    b. General principles
    c. Normal placement of brackets, tubes, lingual sheaths, lingual cleats and buttons onto bands
4. Orthodontic Cements and Adhesive Materials
    a. Classifications
    b. Armamentaria
    c. Mixing technique
5. Cementing Bands
    a. Armamentaria
    b. Mixing techniques
    c. Cementation procedures
6. Removal of Bands after Cementation

LABORATORY SESSION 1

2 Hours

During this session, students will practice sizing, fitting and cementing orthodontic bands on typodont teeth using plain bands and bands with attachments.

LABORATORY SESSION 2

2 Hours

Laboratory practice on typodont teeth continues but now for different quadrants of the mouth and different tooth types including molars, bicuspids and anteriors. Students will become familiar with use of bite sticks in simulation, band pushers, mechanical band seaters and pluggers used for contouring. Additional time should be spent using the mechanical band seaters, as typodonts will not provide adequate pressure to seat bands on typodonts. During laboratory session 2 students will fit a minimum of two first molar bands on typodont teeth with the cementing and removal of one first molar band serving as a practical examination.

PRECLINICAL SESSION

4 Hours

Prior to preclinical session, student partners will place orthodontic separators mesial and distal of maxillary and one mandibular molar 3-4 days prior to the start of the session. During this session, student partners work on each other in simulation as described and demonstrated by instructor on day one. Working with a partner, each student functioning as the operator sizes, fits and cements orthodontic bands. Student will then function as an assistant to observe and evaluate placement with partner. Students will size, fit, and cement orthodontic bands to four first molar teeth with the cementing and removal of two first molar bands serving as a practical examination.

WRITTEN FINAL EXAMINATION

1 Hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

CLINICAL INSTRUCTION

8 Hours

During this session, the instructor will demonstrate the sequence for sizing, fitting and cementing an orthodontic band on active patients. Student experience on active patients will include sizing, fitting, and cementing of orthodontic bands after inspection by the orthodontist on two-four posterior teeth depending on patient needs on a minimum of two patients, with two of the cemented first molar bands used for a clinical exam.

Laboratory, Preclinical and Clinical Instruction

LABORATORY SESSION 1

2 Hours

During this session, students will practice sizing, fitting and cementing orthodontic bands on typodont teeth using bands with pre-welded attachments (using plain bands is an optional extra). Students will work in pairs during these procedures. One student will be the operator while the other will assist the operator. The assisting student will observe each stage of the process for subsequent evaluation. Once the first operator is finished, the students will switch duties.

LABORATORY SESSION 2

2 Hours

Laboratory practice on typodont teeth continues but in different quadrants of the mouth and on different tooth types including molars & bicuspids. Students will become familiar with use of bite sticks in simulation, band pushers, pluggers, and spring activated band seaters. Additional time should be spent using the mechanical spring activated band seaters, as typodonts will not provide adequate pressure to shape & seat bands on the typodont.

Laboratory Instructions

The following is an approximate step-by-step description of the procedures that should be followed during all the laboratory practice sessions:

1. Students will be provided with a typodont, a bench mount for the typodont and at least four posterior typodont teeth. In addition, the student will be provided with individualized packets that will include:
    a. Assortment of band sizes which range above and below those required to fit the typodont teeth
    b. Armamentarium for band sizing, fitting and cementation
    c. Banding cement
2. Each student will set up his/her armamentaria for sizing, fitting and band cementation.
3. Instructor will describe evaluation criteria for ideal band fitting and cementation.
4. Instructor will provide ideal examples that will be passed around for viewing.
5. Student will select the appropriate band sizes, fit bands, contour the bands, prepare them for cementation and then seat and cement the orthodontic bands on the provided typodont teeth.
6. The assisting partner observes, evaluates and records on evaluation worksheet.
7. The student operator will also evaluate him/herself on every step of the procedure.
8. The instructor will evaluate every banding process.
9. The entire process will be repeated using fresh new bands and will continue to be evaluated on the worksheet by the student, partner/assistant and instructor.
10. Each student will fit and cement a minimum of three bands.
11. Partners then switch places—the operator becomes the evaluating assistant, and the former evaluating assistant becomes the operator. The new operator will fit and cement a minimum of three bands as described above.
12. At this point, both students will have fit and cemented at least three bands each. Instructor will now present product evaluation form and how it is used to evaluate final sizing, fitting, and cementing orthodontic bands.
13. Using the product evaluation form, the student operator, the student assistant and instructor will grade all the cemented orthodontic bands for each other.
14. Discussion of evaluation results is conducted in small groups with emphasis on techniques to speed the process and how to improve the quality of the finished product.

PRECLINICAL SESSION

4 Hours

Prior to Preclinical Practice:

Student partners will place orthodontic separators mesial and distal of maxillary and one mandibular molar 3-4 days prior to the start of preclinical session 3.

During this session, student partners work on each other in simulation as previously described and demonstrated by instructor. The following general procedures will occur:

1. Each student, functioning as the operator, sizes, fits, and cements orthodontic bands on their partner/patient.
2. Student will then switch with the operator becoming the patient and the patient becoming the operator.
3. During the entire process, both students will evaluate every step of the process.

The following general procedures will occur for each patient:

1. Operatory will be set up following infection control guidelines
2. Equipment and supplies will be checked by student
3. Student/patient will be seated and prepared for treatment
4. Student operator will perform a patient assessment
5. Instructor will follow-up and check the procedures #1, #2, #3 & #4
6. Patient is given explanation of procedures to be performed
7. Student operator will perform the following according to the stated criteria:
    a. Remove the orthodontic separators
    b. Select, fit and seat orthodontic bands to maxillary and mandibular molars
    c. Properly contour the orthodontic band margin to the tooth
    d. Remove the band in preparation for cementation
    e. Rinse, dry and store the band
    f. Isolate and dry quadrant in preparation for band cementation
    g. Mix the cement (if needed)
    h. Load band with cement
    i. Position and seat orthodontic band completely
    j. Remove excess cement from band and tooth
    k. Request inspection by orthodontist for final positioning
    l. Perform final curing (if using a light curing cement)
    m. Remove all excess cement
    n. Evaluate product using ideal criteria
    o. Give patient post-op instructions
    p. Dismiss patient
    q. Perform operatory clean-up according to infection control guidelines

During the procedure the following will take place:

1. The student/operator will evaluate his/her own work according to stated criteria using the worksheet and product evaluation forms.
2. The student/patient will observe and evaluate operator's performance according to criteria using the worksheet and product evaluation forms.
3. The instructor will evaluate both students' performance following stated criteria entering findings on the worksheet and product evaluation form.
4. Discussion of the results will be conducted on the spot by the instructor.
5. The instructor will explain the upcoming clinical examination protocol. When the student operator performs the last procedure on their student partner, the procedure will be termed and evaluated as a "mock exam" in preparation for the final clinical exam on a bona fide clinical patient.

After the student has finished with the reading materials, laboratory, and preclinical instruction the course provider will provide a written exam to test your knowledge. Use the exam results to determine areas where you need further instruction.

WRITTEN EXAMINATION

1 Hour

CLINICAL INSTRUCTION

8 Hours

During this session, the instructor will demonstrate the sequence for sizing, fitting, and cementing an orthodontic band on active patients.

The following procedures will be demonstrated:

1. Remove the orthodontic separators
2. Select, fit and seat orthodontic bands to a maxillary and mandibular molar
3. Properly contour the orthodontic band margin to the tooth
4. Remove the band in preparation for cementation
5. Rinse, dry and store the band
6. Isolate and dry quadrant in preparation for band cementation
7. Mix the cement (if needed)
8. Load band with cement
9. Position and seat orthodontic band completely
10. Remove excess cement from band and tooth
11. Request inspection by orthodontist for final positioning
12. Perform final curing (if using a light curing cement)
13. Remove all excess cement.
14. Evaluate product using ideal criteria
15. Give patient post-op instructions
16. Dismiss patient
17. Perform operatory clean up according to infection control guidelines

Note: Student experience on active patients will include sizing, fitting and cementing of orthodontic bands (after inspection by the orthodontist) on two-four posterior teeth, depending on patient needs, on a minimum of two patients with two of the cemented first molar bands used for clinical exam.

The following general procedures will occur for each patient:

1. Operatory will be set up following the infection control guidelines
2. Equipment and supplies will be checked by student
3. Student/patient will be seated and prepared for treatment
4. Student operator will perform a patient assessment and check the patient's treatment plan
5. Instructor will follow-up and check the procedures #1, #2, #3 & #4
6. Patient is given explanation of procedures to be performed
7. Student operator will perform the following according to the stated criteria:
    a. Remove the orthodontic separators
    b. Select, fit and seat orthodontic bands to a maxillary and mandibular molar
    c. Properly contour the orthodontic band margin to the tooth
    d. Remove the band in preparation for cementation
    e. Rinse, dry and store the band
    f. Isolate and dry quadrant in preparation for band cementation
    g. Mix the cement (if needed)
    h. Load band with cement
    i. Position and seat orthodontic band completely
    j. Remove excess cement from band and tooth
    k. Request inspection by orthodontist for final positioning
    l. Perform final curing (if using a light curing cement)
    m. Remove all excess cement
    n. Evaluate product using ideal criteria
    o. Give patient post-op instructions
    p. Dismiss patient
    q. Perform operatory clean up according to infection control guidelines

After the student operator completes the sequence of procedures, the student operator, the assistant and the instructor will evaluate the performance of the student operator using the worksheet and product evaluation.

During this process the following procedures will occur:

1. The student/operator will evaluate his/her own work according to stated criteria using the worksheet and product evaluation forms.
2. The student/assistant will assist, observe and evaluate operator's performance according to criteria using the worksheet and product evaluation forms.
3. The instructor will evaluate both students' work/ performance using stated criteria using the worksheet and product evaluation forms.
4. Discussion on results will be conducted.

Worksheets

LABORATORY & CLINICAL PATIENT WORKSHEETS

General Information on Worksheets

The student operator, student assistant, and instructor use these forms. Each of these individuals will watch the performance of the specified steps of the given procedure and then identify if any of these steps are not followed and/or inadequately performed by the student operator. During the learning process, errors can and will occur. Students and clinical instructors identify common errors encountered during each step of the entire procedure utilizing the worksheets. Worksheets are not grade sheets, but they assist the student to identify his or her own errors during performance of these steps. They are used for measuring student's progress toward attainment of clinical proficiency.

General Procedures

An important part of the learning experience in the process of sizing, fitting and cementing bands is the ability to identify technique errors, understand their causes and find solutions. Equally important is to determine the degree of error and when it constitutes a need to redo an inadequately cemented band. The first step in this process is to identify the error(s). Using the Sizing, Fitting and Cementing Bands Laboratory and Clinical Patient Worksheets does this. The worksheets are not grade sheets but are documents that are used to assist students in learning to identify common technique errors related to the procedures associated with the sizing, fitting and cementing orthodontic bands. The student uses this form in the following manner:

The worksheet consists of a column titled Procedure-Laboratory and Procedure-Clinical, which is the step-by-step description of the procedures associated with preparing teeth for bonding brackets. The procedures are subdivided into the following categories:

- Infection Control/Patient Safety
- Assemble Armamentaria
- Sizing & Fitting
- Cementing
- Patient Education
- Infection Control/Patient Safety/Clean-up

How Worksheets Are Used by Student Operator and Student Assistant

1. When performing multiple procedures either in the laboratory or on clinical patients, all of the errors from these series are placed on one worksheet.
2. Each laboratory/clinical experience is graded in a different column.
3. When an error occurs in any of the individual steps described in the Procedure column, a check is placed in the box corresponding to the laboratory/clinical experience.

For example, on the clinical patient worksheet there would be a box for each step of the clinical practice patients. For the laboratory worksheet, there would be a box for the typodont teeth. With worksheet check-offs, the student can identify a clustering pattern of errors in any particular step. When an instructor evaluates the student's performance, he/she cannot only see how a student performs, but whether or not the student can identify errors that he/she makes.

How the Student Identifies Cause and the Correction of Errors

After the student identifies the error(s) performed, he/she will write the cause of the error and how it shall be rectified. The student then identifies whether the error is significant enough to require re-sizing, re-fitting, re-cementing. During this process, the student will review the criteria for successful sizing, fitting and cementing orthodontic bands.

How the Instructor Uses the Worksheets

The instructor watches the student operator during the entire process of sizing, fitting and cementing orthodontic bands. The instructor will check the appropriate box on the same worksheet used by the student operator and the student assistant. The instructor observes both students, and then evaluates the grading completed by both students for accuracy. The instructor reviews the worksheets for information related to: cause, solution and whether any part of the procedure requires additional steps. The instructor can provide additional assistance where needed. This process of identification of errors, causes and solutions will ensure the student will progress towards clinical competence and expected course objectives will be met. This process will continue throughout all laboratory and clinical requirements. When the clinical final exam is administered the student should be clinically competent in sizing, fitting and cementing orthodontic bands.

Satisfactory Performances of Psychomotor Skills

Students will practice psychomotor skills during the laboratory and preclinical sessions until they reach a competence level of 75% utilizing the sizing, fitting and cementing documented criteria evaluated using the behaviorally anchored rating scale. Students must achieve a passing score on a minimum of two typodont teeth or natural teeth before progressing on to successive laboratory, preclinical and clinical sessions.

Worksheet – Laboratory/Preclinical

SIZING, FITTING & CEMENTING ORTHODONTIC BANDS

Date:

Student/Operator Name:

Student/Assistant Name:

Faculty Name:

Band sizing, fitting and cementing on minimum of (8) first molars. Record tooth number(s):

Optional: Add anterior teeth for band sizing, fitting and cementing. Record tooth number(s):

Use this worksheet to identify errors in procedures. Place a check mark in the box each time a step in the procedure is incorrectly performed or omitted. After each section, the instructor will check before the student continues with the following section.

Infection Control/Armamentarium	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
Infection Control/Patient Safety			
1. Barriers placed on chair, unit, air-water syringe, HVE, saliva ejector, SP hand piece, curing light			
2. PPE: mask, gloves, scrubs, gown, eye wear, patient safety glasses			
Assemble Armamentaria			
3. Basic set-up: mirror, explorer, cotton pliers			
4. Air-water syringe, syringe tip, HVE, saliva ejector, band removing pliers, band pusher, bite stick, mechanical band seater, scaler and serrated plugger, crown and bridge scissors, howe pliers, band, crimping pliers, curing light if applicable and cement product			
5. Isolation products-long and short cotton rolls, cheek retractors, tongue guard/ etc.			
6. Typodont with appropriate teeth and bench mount/pole			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Sizing & Fitting Orthodontic Bands	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
7. Remove the orthodontic separators			
8. Select and fit orthodontic bands to a maxillary and mandibular first molar			
9. Properly contour the orthodontic band to the tooth			
10. Remove the band in preparation for cementation			
11. Rinse, dry and load band with cement			
12. Isolate and dry quadrant in preparation for band cementation			
Cementing Orthodontic Band	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
13. Position and seat the orthodontic band			
14. Remove excess cement from band and tooth			
15. Request inspection by orthodontist for final positioning			
16. Perform final curing if light curing cement			
17. Rinse and suction debris.			
18. Remove any remaining isolation materials and rinse well			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Patient Education	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
19. Give post-operative instructions to the patient or parent			
20. Document procedure in patient chart to include: date, HH review or update, teeth where bands were cemented and products used, problems encountered, operator signature, and instructor or DDS signature			

Infection Control/Patient Safety/Clean-Up	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
21. Surface disinfect			
22. Prepare institute sterilization procedures			
23. Manage PPE: gloves, mask, gown, scrubs, eye wear and patient safety glasses			
24. Unit is checked for completion			

Comments:

STUDENT OPERATOR EXPLANATION OF CHECKMARKS

Procedure #s

Cause(s)

Solution(s)

Re-do? Yes No Tooth #s

Worksheet – Clinical Patient

SIZING, FITTING & CEMENTING ORTHODONTIC BANDS

Date:

Student/Operator Name:

Student/Assistant Name:

Faculty Name:

Circle one: Patient #1 Patient #2

Patient Name

Band sizing, fitting and cementing on minimum of (8) first molars. Record tooth number(s):

Optional: Add anterior teeth for band sizing, fitting and cementing. Record tooth number(s):

Use this worksheet to identify errors in procedures. Place a check mark in the box each time a step in the procedure is incorrectly performed or omitted. After each section, the instructor will check before the student continues with the following section.

Infection Control/Armamentarium	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
Infection Control/Patient Safety			
1. Barriers placed on chair, unit, air-water syringe, HVE, saliva ejector, SP hand piece, curing light			
2. PPE: mask, gloves, scrubs, gown, eye wear, patient safety glasses			
Assemble Armamentaria			
3. Basic set-up: mirror, explorer, cotton pliers			
4. Air-water syringe, syringe tip, HVE, saliva ejector, band removing pliers, band pusher, bite stick, mechanical band seater, scaler and serrated plugger, crown and bridge scissors, howe pliers, band, crimping pliers, curing light if applicable and cement product			
5. Isolation products-long and short cotton rolls, cheek retractors, tongue guard/ etc.			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Sizing & Fitting Orthodontic Bands	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
6. Remove the orthodontic separators			
7. Select and fit orthodontic bands to a maxillary and mandibular first molar			
8. Properly contour the orthodontic band to the tooth			
9. Remove the band in preparation for cementation			
10. Rinse, dry and load band with cement			
11. Isolate and dry quadrant in preparation for band cementation			
Cementing Orthodontic Band	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
12. Position and seat the orthodontic band			
13. Remove excess cement from band and tooth			
14. Request inspection by orthodontist for final positioning			
15. Perform final curing if light curing cement			
16. Rinse and suction debris.			
17. Remove any remaining isolation materials and rinse well			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Patient Education	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
18. Give post-operative instructions to the patient or parent.			
19. Document procedure in patient chart to include: date, HH review or update, teeth where bands were cemented and products used, problems encountered, operator signature, and instructor or DDS signature.			
Infection Control/Patient Safety/Clean-Up	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
20. Surface disinfect			
21. Prepare institute sterilization procedures			
22. Manage PPE: gloves, mask, gown, scrubs, eye wear and patient safety glasses			
23. Unit is checked for completion			

Comments:

STUDENT OPERATOR EXPLANATION OF CHECKMARKS

Procedure #s

Cause(s)

Solution(s)

Re-do? Yes No Tooth #s

Product Evaluation Forms

SIZING, FITTING & CEMENTING ORTHODONTIC BANDS

General Procedures

Product evaluation evaluates the end result of any performance, not the steps. This facility utilizes the behaviorally anchored rating scale (BARS) system. This 10-point system clusters the critical incidents into categories. The instructor can score objectively the end result of sizing, fitting and cementing orthodontic bands by choosing the criteria specified in each point level. Performance is assessed according to established criteria for each of these procedures. The points are then converted to a pass or fail grade.

How Instructor Uses Product Evaluation Form

A product evaluation form will be used for each patient. In the "scores" area on the form you will note that an open box rather than specific grids occurs. This open box allows you to enter a score for each of the posterior first molars.

The student must maintain a minimum point value of 7.5 on all clustered critical incidences per tooth. He/she must receive this minimum score for all four posterior first molars during preparation in order to pass this module. A grade of 7.5 represents a 75% passing score.

Product Evaluation Point Conversion

The student will receive points for a given level of achievement from the point scale utilized for product evaluation.

POINT SYSTEM TO A PASS/ FAIL SCORE

Conversion

Points	Grades
10	➨ Pass-Excellent
7.5	➨ Pass
5	➨ Fail-Critical Error(s)
3	➨ Fail-Critical Errors-no concept

Product Evaluation/Practical Examination – Lab Session 1

SIZING, FITTING & CEMENTING ORTHODONTIC BANDS

Student Name:

Patient Name: Typodont

Minimum number of satisfactory performances:

1 first molar sized, fitted and cemented. Record tooth number(s):

PREPAIRING FOR ORTHODINTIC BANDING

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
Preparation of Field A. Assemble armamentarium B. Remove separators C. Pumice teeth **Sizing Bands** A. Estimate size from study model		

FITTING ORTHODINTIC BANDS

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
Fitting A. Initial fitting B. Final contouring C. Remove band in preparation for cementation D. Sand blast inside of band		

CEMENTING ORTHODONTIC BANDS

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
Cementing A. Mixing, preparation, and loading of orthodontic cement B. Rinse dry and load band with cement C. Isolate and dry quadrant D. Position and seat orthodontic band E. Remove excess cement F. Final contouring and burnishing G. Perform final curing if using curing light		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation/Practical Examination – Lab Session 2

SIZING, FITTING & CEMENTING ORTHODONTIC BANDS

Student Name:

Patient Name: Typodont

Minimum number of satisfactory performances:

1 first molar sized, fitted and cemented. Record tooth number(s):

PREPAIRING FOR ORTHODINTIC BANDING

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
Preparation of Field A. Assemble armamentarium B. Remove separators C. Pumice teeth **Sizing Bands** A. Estimate size from study model		

FITTING ORTHODINTIC BANDS

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
Fitting A. Initial fitting B. Final contouring C. Remove band in preparation for cementation D. Sand blast inside of band		

CEMENTING ORTHODONTIC BANDS

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
Cementing A. Mixing, preparation, and loading of orthodontic cement B. Rinse dry and load band with cement C. Isolate and dry quadrant D. Position and seat orthodontic band E. Remove excess cement F. Final contouring and burnishing G. Perform final curing if using curing light		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation/Practical Examination – Preclinical Session

SIZING, FITTING & CEMENTING ORTHODONTIC BANDS

Student Name:

Patient Name:

Minimum number of satisfactory performances:

2 first molar sized, fitted and cemented. Record tooth number(s):

PREPAIRING FOR ORTHODINTIC BANDING

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
Preparation of Field A. Assemble armamentarium B. Remove separators C. Pumice teeth **Sizing Bands** A. Estimate size from study model		

FITTING ORTHODINTIC BANDS

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
Fitting A. Initial fitting B. Final contouring C. Remove band in preparation for cementation D. Sand blast inside of band		

CEMENTING ORTHODONTIC BANDS

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
Cementing A. Mixing, preparation, and loading of orthodontic cement B. Rinse dry and load band with cement C. Isolate and dry quadrant D. Position and seat orthodontic band E. Remove excess cement F. Final contouring and burnishing G. Perform final curing if using curing light		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation/Practical Examination – Clinical Session

SIZING, FITTING & CEMENTING ORTHODONTIC BANDS

Student Name:

Patient Name:

Minimum number of satisfactory performances:

2 first molar sized, fitted and cemented. Record tooth number(s):

PREPAIRING FOR ORTHODINTIC BANDING

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
Preparation of Field A. Assemble armamentarium B. Remove separators C. Pumice teeth **Sizing Bands** A. Estimate size from study model		

FITTING ORTHODINTIC BANDS

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
Fitting A. Initial fitting B. Final contouring C. Remove band in preparation for cementation D. Sand blast inside of band		

CEMENTING ORTHODONTIC BANDS

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
Cementing A. Mixing, preparation, and loading of orthodontic cement B. Rinse dry and load band with cement C. Isolate and dry quadrant D. Position and seat orthodontic band E. Remove excess cement F. Final contouring and burnishing G. Perform final curing if using curing light		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation Documented Criteria

SIZING & FITTING ORTHODONTIC BAND	
Evaluation Criteria	
Points	**Description**
10 Points	➨ Separators are removed without trauma to tissue ➨ Teeth are clean and pumiced ➨ Band fits well to anatomy and height of contour ➨ Band seats by finger pressure to one third of the way to the final position ➨ Field is totally isolated and maintained during procedure
7.5 Points	➨ Separators are removed with small amount of tissue trauma. ➨ Teeth are relatively clean and pumiced ➨ Band fits relatively well to anatomy and height of contour. ➨ Band seats by finger pressure to one third of the way to the final position ➨ Field is adequately isolated and maintained during procedure
5 Points	➨ Separators are removed with tissue trauma ➨ Teeth are not cleaned ➨ Band does not fit well to anatomy and height of contour. ➨ Band does not seat by finger pressure to one third of the way to the final position ➨ Isolation is faulty and saliva penetrates area
3 Points	➨ Separators are removed with gross tissue trauma. ➨ Teeth are not cleaned ➨ Band does not fit to anatomy and height of contour ➨ Band does not seat on tooth ➨ Isolation is not attempted

Product Evaluation Documented Criteria

CEMENTING ORTHODONTIC BAND	
Evaluation Criteria	
Points	**Description**
10 Points	➨ Material is carefully prepared according to manufacturer's directions ➨ Material is evenly applied to inside of band without voids. ➨ Band does not interfere with occlusion ➨ Cement is properly monitored and or cured appropriately. ➨ Excess cement is completely removed ➨ Oral cavity is rinsed all debris is removed
7.5 Points	➨ Material is prepared reasonably accurate to manufacturer's directions ➨ Minor air bubbles in material inside of band ➨ Band does not interfere with occlusion ➨ Cement is adequately monitored and or cured appropriately ➨ Excess cement is removed ➨ Oral cavity is adequately rinsed with most debris removed
5 Points	➨ Material is carelessly prepared ➨ Material is either uneven, irregular or in excess. ➨ Band interferes with occlusion ➨ Cement is not properly monitored and or cured appropriately ➨ Excess cement inadequately removed ➨ Oral cavity is inadequately rinsed with visible debris
3 Points	➨ Material is crudely manipulated ➨ Material is applied with voids ➨ Bands and excess cement interfere with occlusion ➨ Cement is properly monitored and or cured appropriately ➨ Excess cement is not removed ➨ Oral cavity is not rinsed

Course Requirements

During this session, students will practice sizing, fitting and The following is an overview of the course requirements and the protocol followed for laboratory and clinical practice, the written and clinical examination.

Minimum Number of Satisfactory Performances

All students will perform at a minimum the following procedures in order to achieve minimum competence in the various protocols used in the sizing, fitting and cementing orthodontic bands.

On a typodont and patients, the student will perform the following under OSHA and DBC guidelines:

- On the typodont: Sizing, fitting and cementing orthodontic bands will be completed at the very least on four posterior first molars a minimum of two times, with two used for a practical exam according to the specified criteria.
- On the patient: Identify teeth for sizing, fitting and cementing orthodontic bands using appropriate technique with the focus on safety and comfort of the patient. Sizing, fitting and cementing orthodontic bands on four posterior first molars on at least two patients according to the specified criteria with one of each of the four times used for a practical examination with 75% accuracy.

Students are required to meet the specified minimal number of satisfactory performances as indicated above. The student operator grades his/her own performance, the student assistant grades the performance of the student operator and the instructor will assess the student operator's performance and the grading method of both students.

When the student reaches the 75% minimum performance for sizing, fitting and cementing orthodontic bands and 100% performance on all infection control protocol, the instructor evaluates the procedure for the minimal number of satisfactory performances. If a student does not fulfill the minimum grade for the number of satisfactory performances additional laboratory and/or clinical practice procedures will be assigned.

Objective Evaluation Criteria

Objective evaluation criteria shall be provided to each student prior the performance of any procedure. The student will receive information provided by the instructor prior to performing any laboratory or clinical procedures. The instructor shall supply the student with general program, individualized cognitive and psychomotor objectives and criteria for evaluation. Objective criteria will be utilized in the performance of all laboratory and clinical requirements.

Preparation Criteria (Prior to Sizing, Fitting & Cementing Orthodontic Bands)

1. Will review the medical/dental history, make a general assessment, and oral inspection on each patient prior to treatment, checking for information that may contraindicate the performance of the procedure
2. Will set up the required armamentaria for band removal and cement removal with a hand instrument
3. Will use aseptic techniques according to OSHA and DBC throughout performance on all patients
4. Will place protective barriers, seat and position the patient
5. Will evaluate the teeth scheduled for sizing, fitting and cementing orthodontic bands
6. Will explain to patient the treatment planned for that day
7. Will perform sizing, fitting and cementing orthodontic bands
8. Will isolate four posterior first molars for sizing, fitting and cementing orthodontic bands on two patients

Fitting and Sizing of Orthodontic Bands Criteria

1. Will identify teeth for fitting and sizing
2. Will fit and size orthodontic bands using appropriate armamentarium
3. Will proceed safely and with the patient's comfort as a primary focus
4. Will identify special circumstances that require adaptation to treatment to ensure no damage results to tissues or restorations

Cementing of Orthodontic Bands Criteria

1. Will isolate quadrant with dry angles, retractors and cotton rolls as needed
2. Will rinse and dry and prepare to place bands
3. Will evenly place cement free of voids or excess inside of the orthodontic band
4. Will seat band initially with finger pressure followed by full seating with band pushers and bite sticks
5. Will take care when removing excess cement
6. Will be meticulous in monitoring debris to prevent swallowing or aspirating residual cement
7. Will take care not to injure soft or hard tissues

General Criteria

1. Will provide pertinent and individualized patient education
2. Will provide follow up appointment as identified in the treatment plan
3. Will meet ethical and legal requirements for this procedure
4. Will provide accurate chart entries for this procedure
5. Will utilize OSHA and DBC guidelines for instrument processing, removing waste and cleaning/disinfecting treatment area

The above criteria will be used to evaluate and access appropriate fitting, sizing and cementing orthodontic bands with a minimum of 75% accuracy for laboratory and clinical patients.

General Clinical Practice Protocol

Students will complete procedures on two clinical patients. The following general procedures will occur:

Patient Selection Criteria

The following criteria must apply for each patient:

1. Patient must be an active orthodontic patient
2. Patient must be in good health (medical history form will be completed prior to treatment, reviewed and approved by the instructor)
3. Each patient will have a minimum of two posterior first molars for fitting, sizing and cementing orthodontic bands

The student will function as an operator, an assistant and a patient. Working as partners (operator and assistant) an operator will perform the procedure, the assistant will observe, and evaluate each step of the procedure. When complete each student will do the procedure, observe and evaluate.

The following general procedures will occur for each of the patients:

1. Operatory will be set up following the infection control guidelines
2. Medical history will be completed by the patient prior to seating
3. Equipment and supplies will be checked by the student
4. Patient will be seated and prepared for treatment
5. Student operator will review the medical history and perform a visual exam
6. The instructor will review the medical history and perform a visual exam
7. Instructor will accept the patient for fitting, sizing, and cementing orthodontic bands
8. Student operator will perform the following according to the stated criteria:
    a. Identify teeth for sizing, fitting and cementing orthodontic bands
    b. Remove separators
    c. Pumice teeth prior to sizing, fitting and cementing orthodontic bands
    d. Size, fit and cement orthodontic bands
    e. Rinse and remove isolation products
    f. Evaluate the product
    g. Provide individualized patient education
    h. Dismiss the patient
    i. Make appropriate chart notes
    j. Perform operatory clean-up/instrument processing according to infection control guidelines

After sizing fitting and cementing orthodontic bands procedure, the student operator, student assistant and the instructor complete evaluation using the worksheet and product evaluation form.

During this time period, the following will occur:

1. Student operator will evaluate his/her own work according to stated criteria using worksheet and product evaluation forms
2. Student assistant will assist, observe, evaluate operator's performance according to stated criteria using the worksheet and product evaluation forms
3. The instructor will evaluate both students' work according to stated criteria using the worksheet and product evaluation forms. Results will be discussed

A 75% must be obtained for passage of sizing, fitting and cementing bands.

General Examination Protocol

Written Examination

A comprehensive written examination of 42 questions on the entire curriculum will be administered. The student must receive a minimum score of 75% on the examination to pass the class. One hour has been reserved for the written examination.

Clinical Final Examination

The clinical final examination occurs during the process of working on the two active orthodontic patients during the sizing, fitting and cementing of orthodontic bands on four posterior first molars following patient selection criteria and procedures outlined in the module's clinical practice protocol.

Written Examination

1. Modern orthodontic band features include:
   a. Fine medical grade stainless steel
   b. Smooth surface and comfortable fit
   c. Permanent laser marking for size and tooth location
   d. Anatomical form corresponds to the morphology of tooth
   e. a and b
   f. b and d
   g. a, b, c, and d
2. The band is first seated on the _____ aspect when being sized for mandibular premolars and molars.
   a. Buccal
   b. Lingual
   c. Mesial
   c. Distal

Match the definitions to their corresponding terms:

3. Separating pliers _____
4. Band removing pliers _____
5. Band pusher _____
6. Mechanical band seater _____
7. Bite stick _____
8. Howe pliers _____
9. Band crimping pliers _____
   a. High impact plastic with varied tip design preferred method for band seating
   b. Sometimes used for holding a band and bracket combination, seating and assisting with crimping the band
   c. Specialized plier to hold and place separators
   d. Specialize plier for crimping gingival aspect of band to improve fit
   e. Handled instrument with solid serrated tip to push bands into place and assist in gross contouring
   f. Hammer device similar to band pusher
   g. Pliers with specialized tips with one tip with a plastic stop placed on occlusal cusp of tooth for leverage

10. Classifications of cements used for orthodontic band cementation are:
    a. Water-based
    b. Resin-modified glass ionomer
    c. Resin-based
    d. a and c
    e. a, b and c
11. Cementation armamentarium includes a mixing slab or pad, mixing spatula and a plastic instrument.
    a. True
    b. False
12. Mixing orthodontic band cements varies considerably with the type of luting cement mixed. To increase mixing time a warm glass slab should be used.
    a. The first statement is false and the second is true
    b. The first statement is true and the second is false
    c. Both statements are true
    d. Both statements are false
13. Zinc phosphate is a water-based cement that is used for orthodontic band cementation. Since zinc phosphate is water-soluble and susceptible to dissolving it can lead to loss of cement and possible decalcification of enamel.
    a. The first statement is false and the second is true
    b. The first statement is true and the second is false
    c. Both statements are true
    d. Both statements are false
14. Documentation in the chart regarding size used for each banded tooth is not necessary when cementing bands.
    a. True
    b. False
15. The assistant should arrange all bands in order of cementation according to the orthodontist's preference. Each band is placed on a square of masking tape with the gingival side down.
    a. The first statement is false and the second is true
    b. The first statement is true and the second is false
    c. Both statements are true
    d. Both statements are false

16. During isolation for band cementation the assistant should place cotton rolls and dry the teeth using an air syringe.
    a. True
    b. False
17. With the advent of brackets the use of orthodontic bands has decreased. Despite the broad use of bonded brackets, there are a number of circumstances where bands remain a preferred option.
    a. The first statement is false and the second is true
    b. The first statement is true and the second is false
    c. Both statements are true
    d. Both statements are false
18. Orthodontic bands provide:
    a. Foundation for supporting passive appliances in the mixed dentition
    b. A platform to solder appliances for arch expansion
    c. a and b
19. Orthodontic bands must fit the tooth and offer resistance to:
    a. Bite sticks
    b. Chewing forces
    c. Corrosion
    d. a, b and c
20. Today most orthodontic bands are fabricated using:
    a. Precious metal alloys
    b. Stainless steel
    c. Gold alloy
    d. a and b
    e. a, b and c
21. Bands must possess reduced sensitivity or allergy in the majority of patients.
    a. True
    b. False

Match the terms to their corresponding definitions:

22. Malleability _____
23. Ductility _____
24. Stiffness _____
25. Work hardening _____
    a. Material property that resists deforming with mastication, seating bands & tooth movement
    b. A materials ability to be compressed into a thin sheet by hammering or rolling without forming or fractures
    c. Describes the property by which a metal or alloy fractures when continually bent
    d. Typically have the property of being able to be drawn or stretched without breakage to form thin wires and sheets.
26. Stainless steel orthodontic bands are:
    a. .005-.007 inches thick
    b. 1/2 inches tall
    d. a and b
27. Manufacturers offer preformed bands in progressive sizes. They are designed to fit both anterior and posterior maxillary and mandibular teeth.
    a. The first statement is true the second is false
    b. Both statements are true
    c. Both statements are false
    d. The first statement is false and the second is true
28. A well-fitted band encompasses the height of contour of the tooth with the occlusal aspects of the band located at the height of the marginal ridges both mesial and distal.
    a. True
    b. False
29. You should be able to remove the band easily with fingers prior to cementing.
    a. True
    b. False
30. Fitting the band also includes adapting the occlusal and gingival margin of the band.
    a. True
    b. False

31. Loose bands will lead to:
    a. Thick cement lines reducing retention
    b. Cement washout
    c. a and b
32. Initial sizing of bands is always done in the patient's mouth. The initial sizing of bands can occur utilizing the study model.
    a. The first statement is true and the second is false
    b. The first statement is false and the second is true
    c. Both statements are true
    d. Both statements are false
33. Bands not selected for use but have been placed in the mouth are sterilized and placed back into inventory.
    a. True
    b. False
34. When fitting bands the tendency is to select a final band, which is too small. This is common when the separation is insufficient and the band is forced through the contact
    a. The first statement is true and the second is false
    b. The first statement is false and the second is true
    c. Both statements are true
    d. Both statements are false
35. The orthodontic band is merely the foundation for a large number of different attachments or accessories. Orthodontists order bands with specific attachments or plain bands depending on the application required.
    a. The first statement is true and the second is false
    b. The first statement is false and the second is true
    c. Both statements are false
    d. Both statements are true

Match the following attachments that are available preassembled on the orthodontic band:

36. Brackets _____
37. Lingual sheaths _____
38. Cleats or seating lugs _____
39. Buttons and hooks _____
    a. These attachments have pads that can be welded to individual bands in the office using an orthodontic spot welder
    b. Include single, double and triple tube configurations, headgear tube and rectangular slot combinations.
    c. Are welded to the lingual aspect of maxillary and mandibular molars
    d. Provide a positive seat for bite sticks
40. Water-based cements used for cementing orthodontic bands include:
    a. Zinc Phosphate
    b. Zinc polycarboxylate
    c. Glass Ionomer
    d. Resin-modified Glass Ionomer Cement
    e. All of the above
    f. a, b and c
41. _____was developed in 1972 and releases fluoride.
    a. Zinc Phosphate
    b. Zinc polycarboxylate
    c. Glass Ionomer
42. Dental cements are:
    a. Hard
    b. Brittle
    c. Some are viscous materials that harden by light-curing
    d. All of the above

Written Examination Answer Key

1. g
2. b
3. c
4. g
5. e
6. f
7. a
8. b
9. d
10. e
11. a
12. b
13. c
14. b
15. b
16. a
17. c
18. d
19. d
20. b
21. a
22. b
23. d
24. a
25. c
26. a
27. b
28. a
29. b
30. a
31. c
32. b
33. a
34. b
35. d
36. b
37. c
38. d
39. a
40. f
41. c
42. d

Module 3

Removal of Orthodontic Bands and Cement Removal with a Hand Instrument

By: Matt Molitor

PERFORMANCE OBJECTIVES

After completing the following areas of didactic, laboratory, and clinical instruction in removing orthodontic bands and removing cement with a hand instrument, the student will be able to:

1. Identify who may legally remove orthodontic bands and residual supragingival cement
2. Identify teeth with orthodontic bands
3. Remove orthodontic bands using appropriate armamentarium
4. Describe techniques and steps for orthodontic band removal
5. Describe steps for identifying residual cement
6. Describe steps for supra-gingival cement removal
7. Remove orthodontic bands from an orthodontically banded typodont and cement a minimum of four times with one of the four times used for a practical examination to a 75% minimum proficiency level
8. Maintain patient safety and comfort during removal of bands and residual cement
9. Remove orthodontic bands and residual cement on at least two patients to a 75% minimum proficiency level
10. Student, partner and instructor will evaluate the process according to the stated criteria. Identify techniques to improve and or modify
11. Maintain infection control to standards defined by OSHA and DBC

On typodont teeth and patients, the student will be able to:

1. Assemble appropriate armamentarium for orthodontic band removal and cement removal with a hand instrument.
2. Determine the teeth where bands will be removed.
3. Identify residual cement.
4. Remove bands from typodont teeth at least four times with one of the four times used for a practical examination according to specific criteria to a 75% level.
5. Remove residual cement supragingival from typodont teeth at least four times with one of the four times used for a practical examination according to specific criteria to a 75% level.
6. Evaluate and assess appropriate orthodontic band removal and cement removal with a hand instrument.
7. Provide appropriate patient education.
8. Maintain appropriate infection control during orthodontic band removal and cement removal with a hand instrument.

Outline

DIDACTIC SESSION

4 Hours

1. Identifying Teeth with Orthodontic Bands
    a. Teeth most likely to have bands
    b. Differentiating bands from other orthodontic appliances
    c. Components of an orthodontic band and attachments
2. Removal of Orthodontic Bands
    a. Instruments used (armamentarium)
    b. Technique for removal of bands
3. Patient Safety and Comfort during Removal of Bands
    a. Explain the procedure and patient experience
    b. Prevention of swallowing/aspiration
    c. Special care for soft and hard tissues
4. Special Circumstances
    a. Crowns, fillings, possibility of fracture or damage
    b. Inflamed tissue
    c. Patients with limited opening
5. Identifying residual cement
    a. Types of band cement
    b. Differentiating from stain/discoloration
    c. Identifying decalcification or white spots and proper action to take
    d. Factors influencing amount of residual cement (etched teeth, bands)
    e. Likely places to find residual cement (band space, interproximal areas, etc.)
6. Supragingival removal of residual cement with a hand instrument
    a. Instruments used (armamentarium)
    b. Technique for removal of residual cement
7. Patient safety and comfort during removal of cement
    a. Prevention of swallowing/aspiration (use of suction)
    b. Special care for soft and hard tissues
    c. Patient home care instruction to reduce inflammation and hypertrophy

LABORATORY SESSION

2 Hours

During this session, students will practice the removal of orthodontic bands as well as the techniques for removal of cement with a hand instrument on a typodont.

PRECLINICAL SESSION

2 Hours

During this session, students will practice the removal of orthodontic bands as well as the techniques for removal of cement with a hand instrument on each other after bands were cemented in the second module. Students will work with a partner during the process of these procedures; the assisting student will observe each stage of the process for evaluation.

WRITTEN FINAL EXAMINATION

1 Hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

CLINICAL INSTRUCTION

4 Hours

During this session, the students will participate in the removal of excess cement supra gingivally from orthodontic bands with a hand instrument on at least two active patients.

Laboratory, Preclinical and Clinical Instruction

LABORATORY SESSION

2 Hours

During this session, students will practice the removal of orthodontic bands as well as techniques for removal of cement with a hand instrument on a typondont. Students will work in pairs during these procedures. One student will be the operator while the other will assist the operator. The assisting student will observe each stage of the process for subsequent evaluation. Once the first operator is finished, the students will switch duties.

Laboratory Instructions

The following is a step-by-step description of the procedures that should be followed during the laboratory practice session:

1. Each student will set up his/her armamentaria for removal of bands and residual cement.
2. Student will be provided with a typodont with banded posterior teeth (cemented) and a bench mount.
3. Instructor will review procedures for removal of bands and excess cement.
4. Instructor will provide ideal examples that will be passed around for viewing.
5. Student will remove the bands from the typodont tooth while partner observes, evaluates and records on worksheet. Student will also evaluate him/herself on the procedure. Instructor evaluates the removal of the bands as well as the cement removal.
6. The bands will be re-cemented for further practice as needed based on instructor's evaluation.
7. The entire process will continue to be evaluated on the worksheet by the student, partner/assistant and instructor.
8. Students will complete a minimum of four band removals and cement removals with one of the four times used for a practical examination.
9. Partners then switch places—the operator becomes the evaluating assistant, and the former evaluating assistant becomes the operator so both student partners have completed four typodont teeth.
10. The worksheets and product evaluation forms are then reviewed and discussed by students and instructor.

PRECLINICAL SESSION

2 Hours

During this session, students will practice the removal of orthodontic bands as well as the techniques for removal of cement with a hand instrument on each other after bands were cemented in the second module. Student partners work on each other in simulation as previously described and demonstrated by instructor.

The following general procedures will occur:

1. Each student will set up his/her armamentaria for removal of bands and residual cement.
2. Each student will serve as the patient with the previously cemented banded posterior teeth.
3. Instructor will review procedures for removal of bands and excess cement.
4. Instructor will provide ideal examples that will be passed around for viewing.
5. Student will remove the bands from the partner while the partner observes in a patient mirror and records evaluation on worksheet. Student will also evaluate him/herself on the procedure.
6. Instructor evaluates the removal of the bands as well as the cement removal.
7. The bands will be re-cemented for further practice as needed based on instructor's evaluation.
8. The entire process will continue to be evaluated on the worksheet by the student, partner/assistant and instructor.
9. Band removal and cement removal will be completed a minimum of four times with one of the four times used for a practical examination.
10. Partners switch places, the operator becomes the patient, and the patient becomes the operator.
11. The worksheets and product evaluations will be evaluated by the students and instructor.

WRITTEN EXAMINATION

1 Hour

CLINICAL SESSION

4 Hours

During this session, the students will participate in the removal of excess cement supra gingivally from orthodontic bands with a hand instrument on at least two active patients.

1. Each student will set up his/her armamentaria for removal of bands and residual cement.
2. Student will be provided with two patients.
3. Instructor will review procedures for removal of bands and excess cement.
4. Student will remove the bands from the patients while partner observes, evaluates and records on worksheet.
5. Student will also evaluate him/herself on the procedure.
6. Instructor evaluates the removal of the bands as well as the cement removal. The entire process will continue to be evaluated on the worksheet by the student, partner/assistant and instructor.
7. Students will complete a minimum of four band removals and cement removals with one of the four times used for a clinical examination.
8. Partners switch places, the operator becomes the assistant, and the assistant becomes the operator, both student partners have completed at this point four teeth on each patient.
9. The worksheets are then evaluated by the students and instructor.

Worksheets

LABORATORY & CLINICAL PATIENT WORKSHEETS

General Information on Worksheets

The student operator, student assistant, and instructor use these forms. Each of these individuals will watch the performance of the specified steps of the given procedure and then identify if any of these steps are not followed and/or inadequately performed by the student operator. During the learning process, errors can and will occur. Students and clinical instructors identify common errors encountered during each step of the entire procedure utilizing the worksheets. Worksheets are not grade sheets, but they assist the student to identify his or her own errors during performance of these steps. They are used for measuring student's progress toward attainment of clinical proficiency.

General Procedures

An important part of the learning experience in the process of orthodontic band removal and cement removal with a hand instrument is the ability to identify technique errors, understand their causes and find solutions. Equally important is to determine the degree of error and when it constitutes a need to redo an inadequately cemented band. The first step in this process is to identify the error(s). Using the Removal of Orthodontic Bands and Cement Removal Laboratory and Clinical Patient Worksheets does this. The worksheets are not grade sheets but are documents that are used to assist students in learning to identify common technique errors related to the procedures associated with orthodontic band removal and cement removal with a hand instrument. The student uses this form in the following manner:

The worksheet consists of a column titled Procedure-Laboratory and Procedure-Clinical, which is the step-by-step description of the procedures associated with preparing teeth for bonding brackets. The procedures are subdivided into the following categories:

- Infection Control/Patient Safety
- Assemble Armamentaria
- Band and Cement Removal
- Identify Residual Cement
- Patient Education
- Infection Control/Patient Safety/Clean-up

How Worksheets Are Used by Student Operator and Student Assistant

1. When performing multiple procedures either in the laboratory or on clinical patients, all of the errors from these series are placed on one worksheet.
2. Each laboratory/clinical experience is graded in a different column.
3. When an error occurs in any of the individual steps described in the Procedure column, a check is placed in the box corresponding to the laboratory/clinical experience.

For example, on the clinical patient worksheet there would be a box for each step of the clinical practice patients. For the laboratory worksheet, there would be a box for the typodont teeth. With worksheet check-offs, the student can identify a clustering pattern of errors in any particular step. When an instructor evaluates the student's performance, he/she cannot only see how a student performs, but whether or not the student can identify errors that he/she makes.

How the Student Identifies Cause and the Correction of Errors

After the student identifies the error(s) performed, he/she will write the cause of the error and how it shall be rectified. The student then identifies whether the error is significant enough to require re-sizing, re-fitting, re-cementing. During this process, the student will review the criteria for successful band removal and cement removal with a hand instrument.

How the Instructor Uses the Worksheets

The instructor watches the student operator during the entire process of band removal and cement removal with a hand instrument. The instructor will check the appropriate box on the same worksheet used by the student operator and the student assistant. The instructor observes both students, and then evaluates the grading completed by both students for accuracy. The instructor reviews the worksheets for information related to: cause, solution and whether any part of the procedure requires additional steps. The instructor can provide additional assistance where needed. This process of identification of errors, causes and solutions will ensure the student will progress towards clinical competence and expected course objectives will be met. This process will continue throughout all laboratory and clinical requirements. When the clinical final exam is administered the student should be clinically competent in orthodontic band removal and cement removal with a hand instrument.

Satisfactory Performances of Psychomotor Skills

Students will practice psychomotor skills during the laboratory and preclinical sessions until they reach a competence level of 75% utilizing the documented criteria evaluated using the behaviorally anchored rating scale. Students must achieve a passing score on a minimum of two typodont teeth or natural teeth before progressing on to successive laboratory, preclinical and clinical sessions.

Worksheet – Laboratory/Preclinical

REMOVAL OF BANDS/CEMENT WITH HAND INSTRUMENT

Date:

Student/Operator Name:

Student/Assistant Name:

Faculty Name:

Minimum of 4 anterior teeth banded with cement removal. Record tooth number(s):

Minimum of 4 posterior teeth banded with cement removal. Record tooth number(s):

Use this worksheet to identify errors in procedures. Place a check mark in the box each time a step in the procedure is incorrectly performed or omitted. After each section, the instructor will check before the student continues with the following section.

Infection Control/Armamentarium	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
Infection Control/Patient Safety			
1. Barriers placed on chair, unit, air-water syringe, HVE, saliva ejector, SP hand piece, curing light			
2. PPE: mask, gloves, scrubs, gown, eye wear, patient safety glasses			
Assemble Armamentaria			
3. Basic set-up: mirror, explorer, cotton pliers			
4. Air-water syringe, syringe tip, HVE, saliva ejector			
5. Low-speed hand piece with disposable prophy angle			
6. Pumice/prophy paste with fluoride			
7. Isolation products-long and short cotton rolls, cheek retractors, tongue guard/ etc.			
8. Band Removing Pliers			
9. Sickle Scaler			

10. Typodont with appropriate teeth and bench mount/pole			
11. High speed hand piece/fluted bur/green stone (DDS use only)			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Band and Cement Removal	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
12. Verify teeth for band removal			
13. Use band-removing pliers to safely remove the band from the tooth with minimal pressure and discomfort to the patient			
14. Primary focus is patient safety, prevention of swallowed or aspirated bands			
15. Teeth that have restorations takes special care when removing bands			
16. Inflamed tissue bleeds easily; suction should be employed to remove blood and excess saliva			
Identify Residual Cement	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
17. Use an instrument to "feel" for visual inspection may not be reliable			
18. Use explorer to detect residual cement			
19. Inspect the interproximal areas where residual cement may be hiding			
20. Use modified pen grasp to remove residual cement using a sickle scaler while employing a secure fulcrum			
21. The blade of the scaler is used to detect and dislodge cement. Apply blade at less than 90 degrees but no less than 45 degrees. Employ pull stroke			
22. Suction small fragments as they are removed			
23. If residual cement cannot be removed with a hand instrument the orthodontist should use the high-speed hand piece and bur for final removal			
24. Rinse and suction remaining debris			

25. Polish using prophy paste with fluoride			
26. Remove any remaining isolation materials and rinse well			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Patient Education	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
27. Give post-operative instructions to the patient or parent			
28. Document procedure in patient chart to include: date, HH review or update, teeth where bands and or cement were removed, products used, problems encountered, operator signature, and instructor or DDS signature			
Infection Control/Patient Safety/Clean-Up	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
29. Surface disinfect			
30. Prepare and institute sterilization procedures			
31. Manage PPE: gloves, mask, gown, scrubs, eye wear and patient safety glasses			
32. Unit is checked for completion			

Comments:

STUDENT OPERATOR EXPLANATION OF CHECKMARKS

Procedure #s

Cause(s)

Solution(s)

Re-do? Yes No Tooth #s

Worksheet – Clinical Patient

REMOVAL OF BANDS/CEMENT WITH HAND INSTRUMENT

Date:

Student/Operator Name:

Student/Assistant Name:

Faculty Name:

Circle one: Patient #1 Patient #2

Patient Name:

Minimum of 4 anterior teeth banded with cement removal. Record tooth number(s):

Minimum of 4 posterior teeth banded with cement removal. Record tooth number(s):

Use this worksheet to identify errors in procedures. Place a check mark in the box each time a step in the procedure is incorrectly performed or omitted. After each section, the instructor will check before the student continues with the following section.

Infection Control/Armamentarium	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
Infection Control/Patient Safety			
1. Barriers placed on chair, unit, air-water syringe, HVE, saliva ejector, SP hand piece, curing light			
2. PPE: mask, gloves, scrubs, gown, eye wear, patient safety glasses			
Assemble Armamentaria			
3. Basic set-up: mirror, explorer, cotton pliers			
4. Air-water syringe, syringe tip, HVE, saliva ejector			
5. Low-speed hand piece with disposable prophy angle			
6. Pumice/prophy paste with fluoride			
7. Isolation products-long and short cotton rolls, cheek retractors, tongue guard/ etc.			

8. Band Removing Pliers			
9. Sickle Scaler			
10. High speed hand piece/fluted bur/green stone (DDS use only)			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Band and Cement Removal	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
11. Verify teeth for band removal			
12. Use band-removing pliers to safely remove the band from the tooth with minimal pressure and discomfort to the patient			
13. Primary focus is patient safety, prevention of swallowed or aspirated bands			
14. Teeth that have restorations takes special care when removing bands			
15. Inflamed tissue bleeds easily; suction should be employed to remove blood and excess saliva			
Identify Residual Cement	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
16. Use an instrument to "feel" for visual inspection may not be reliable			
17. Use explorer to detect residual cement			
18. Inspect the interproximal areas where residual cement may be hiding			
19. Use modified pen grasp to remove residual cement using a sickle scaler while employing a secure fulcrum			
20. The blade of the scaler is used to detect and dislodge cement. Apply blade at less than 90 degrees but no less than 45 degrees. Employ pull stroke			
21. Suction small fragments as they are removed			
22. If residual cement cannot be removed with a hand instrument the orthodontist should use the high-speed hand piece and bur for final removal			
23. Rinse and suction remaining debris			

24. Polish using prophy paste with fluoride			
25. Remove any remaining isolation materials and rinse well			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Patient Education	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
26. Give post-operative instructions to the patient or parent.			
27. Document procedure in patient chart to include: date, HH review or update, teeth where bands and or cement were removed, products used, problems encountered, operator signature, and instructor or DDS signature.			
Infection Control/Patient Safety/Clean-Up	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
28. Surface disinfect			
29. Prepare and institute sterilization procedures			
30. Manage PPE: gloves, mask, gown, scrubs, eye wear and patient safety glasses			
31. Unit is checked for completion			

Comments:

STUDENT OPERATOR EXPLANATION OF CHECKMARKS

Procedure #s

Cause(s)

Solution(s)

Re-do? Yes No Tooth #s

Product Evaluation Forms

REMOVAL OF BANDS/CEMENT WITH HAND INSTRUMENT

General Procedures

Product evaluation evaluates the end result of any performance, not the steps. This facility utilizes the behaviorally anchored rating scale (BARS) system. This 10-point system clusters the critical incidents into categories. The instructor can score objectively the end result of sizing, fitting and cementing orthodontic bands by choosing the criteria specified in each point level. Performance is assessed according to established criteria for each of these procedures. The points are then converted to a pass or fail grade.

How Instructor Uses Product Evaluation Form

A product evaluation form will be used for each patient. In the "scores" area on the form you will note that an open box rather than specific grids occurs. This open box allows you to enter a score for each of the posterior first molars.

The student must maintain a minimum point value of 7.5 on all clustered critical incidences per tooth. He/she must receive this minimum score for all four posterior first molars selected for orthodontic band removal and cement removal with a hand instrument in order to pass this module. A grade of 7.5 represents a 75% passing score.

Product Evaluation Point Conversion

The student will receive points for a given level of achievement from the point scale utilized for product evaluation.

POINT SYSTEM TO A PASS/ FAIL SCORE

Conversion

Points	Grades
10	➨ Pass-Excellent
7.5	➨ Pass
5	➨ Fail-Critical Error(s)
3	➨ Fail-Critical Errors-no concept

Product Evaluation/Practical Examination – Lab Session

REMOVAL OF BANDS/CEMENT WITH HAND INSTRUMENT

Student Name:

Patient Name: Typodont

Minimum number of satisfactory performances:

1 first molar band removed and cement removed with a hand instrument. Record tooth number(s):

BAND REMOVAL

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Assemble armamentarium B. Remove separators C. Pumice teeth		

CEMENT REMOVAL

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Identify cement to be removed B. Remove cement safely and comfortably C. Removal of residual cement complete D. Coronal polish E. Provide individualized patient education		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation/Practical Examination – Preclinical Session

REMOVAL OF BANDS/CEMENT WITH HAND INSTRUMENT

Student Name:

Patient Name:

Minimum number of satisfactory performances:

1 first molar band removed and cement removed with a hand instrument. Record tooth number(s):

BAND REMOVAL

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Assemble armamentarium B. Remove separators C. Pumice teeth		

CEMENT REMOVAL

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Identify cement to be removed B. Remove cement safely and comfortably C. Removal of residual cement complete D. Coronal polish E. Provide individualized patient education		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation/Practical Examination – Clinical Session

REMOVAL OF BANDS/CEMENT WITH HAND INSTRUMENT

Student Name:

Patient Name:

Minimum number of satisfactory performances:

1 first molar band removed and cement removed with a hand instrument. Record tooth number(s):

BAND REMOVAL

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Assemble armamentarium B. Remove separators C. Pumice teeth		

CEMENT REMOVAL

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Identify cement to be removed B. Remove cement safely and comfortably C. Removal of residual cement complete D. Coronal polish E. Provide individualized patient education		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation Documented Criteria

BAND REMOVAL	
Evaluation Criteria	
Points	**Description**
10 Points	➨ Teeth identified correctly ➨ Band removing pliers used appropriately ➨ Band removed safely ➨ Care was taken for a banded tooth with special circumstances ➨ Patient's comfort was considered
7.5 Points	➨ Teeth identified correctly ➨ Band removing pliers varies slightly from ideal ➨ Band removed safely ➨ Care was taken for a banded tooth with special circumstances ➨ Patient's comfort was considered
5 Points	➨ Teeth identified incorrectly ➨ Band removing pliers used inappropriately ➨ Band removal varies from ideal ➨ Care was not taken for a banded tooth with special circumstances ➨ Patient's comfort was not considered
3 Points	➨ Teeth identified incorrectly ➨ Band removing pliers used inappropriately ➨ Band removal varies more than slightly from ideal ➨ Care was not taken for a banded tooth with special circumstances ➨ Patient's comfort was not considered

Product Evaluation Documented Criteria

CEMENT REMOVAL WITH A HAND INSTRUMENT	
Evaluation Criteria	
Points	**Description**
10 Points	➨ Cement identified using an explorer, buccal, lingual, and interproximally ➨ Cement is removed safely supra-gingivally with a scaler using a fulcrum ➨ Care was taken for a tooth with special circumstances ➨ Patient's comfort was considered and maintained ➨ Debris/cement is identified/removed completely ➨ Tooth coronally polished to restore luster (coronal polish class taken)
7.5 Points	➨ Cement identified using an explorer, buccal, lingual, and interproximally ➨ Cement is removed safely supra-gingivally with a scaler using a fulcrum ➨ Care was taken for a tooth with special circumstances ➨ Patient's comfort was considered and maintained ➨ Debris/cement is identified and removed completely ➨ Tooth coronally polished to restore luster (coronal polish class taken)
5 Points	➨ Difficulty identifying cement with explorer ➨ Removal of cement using an inadequate fulcrum making this step unsafe ➨ Patient is uncomfortable during cement removal ➨ Debris/cement is not identified or completely removed ➨ Tooth is polished but not well (coronal polish class taken)
3 Points	➨ Unable to identify residual cement with a scaler ➨ Uses explorer in an attempt to remove residual cement ➨ Patient is uncomfortable during cement removal ➨ Debris/cement is not identified or completely removed ➨ Tooth is polished but not well (coronal polish class taken)

Course Requirements

The following is an overview of the course requirements and the protocol followed for laboratory and clinical practice, the written and clinical examination.

Minimum Number of Satisfactory Performances

All students will perform at a minimum the following procedures in order to achieve minimum competence in the various protocols used in the removal of bands and cement removal with a hand instrument.

On a typodont and patients, the student will perform the following under OSHA and DBC guidelines:

- On the typodont: band removal will be completed at the very least on four posterior first molars a minimum of two times, with one used for a practical exam according to the specified criteria.
- On the patient: Identify teeth with bands that will be removed with band removal pliers using proper technique with the focus on safety and comfort of the patient. Removing four posterior first molar bands on at least two patients according to the specified criteria with one of each of the four times used for a practical examination with 75% accuracy.

Students are required to meet the specified minimal number of satisfactory performances as indicated above. The student operator grades his/her own performance, the student assistant grades the performance of the student operator and the instructor will assess the student operator's performance and the grading method of both students.

When the student reaches the 75% minimum performance for removal of bands and cement removal with a hand instrument and 100% performance on all infection control protocol, the instructor evaluates the procedure for the minimal number of satisfactory performances. If a student does not fulfill the minimum grade for the number of satisfactory performances additional laboratory and/or clinical practice procedures will be assigned.

Objective Evaluation Criteria

Objective evaluation criteria shall be provided to each student prior the performance of any procedure. The student will receive information provided by the instructor prior to performing any laboratory or clinical procedures. The instructor shall supply the student with general program, individualized cognitive and psychomotor objectives and criteria for evaluation. Objective criteria will be utilized in the performance of all laboratory and clinical requirements.

Preparation Prior to Band Removal

1. Will review the medical/dental history, make a general assessment, and oral inspection on each patient prior to treatment, checking for information that may contraindicate the performance of the procedure
2. Will set up the required armamentaria for band removal and cement removal with a hand instrument
3. Will use aseptic techniques according to OSHA and DBC throughout performance on all patients
4. Will place protective barriers, seat and position the patient
5. Will evaluate the teeth scheduled to have band removal and cement removal with a hand instrument
6. Will explain to patient the treatment planned for that day
7. Will perform band removal and cement removal with a hand instrument
8. Will isolate four posterior first molars in preparation for band removal and subsequent cement removal with a hand instrument on two patients

Removal of Orthodontic Bands Criteria

1. Identify teeth with orthodontic bands
2. Will remove the orthodontic bands using appropriate armamentarium
3. Will proceed safely and with the patient's comfort as a primary focus
4. Will identify special circumstances that require adaptation to treatment to ensure no damage results to tissues or restorations

Removal of Cement with Hand Instrument Criteria

1. Will remove residual cement with a hand instrument following band removal
2. Will explore areas where residual cement will be found (band space). These areas will be on the buccal, lingual and interproximal
3. Will remove residual cement supra-gingivally with a hand instrument
4. Care will be taken to use a stable fulcrum
5. Care will be taken while using a pull stroke with the sickle scaler when removing residual cement
6. Will be meticulous in monitoring debris to prevent swallowing or aspirating residual cement
7. Will take care not to injure soft or hard tissues

General Criteria

1. Will provide pertinent and individualized patient education
2. Will provide follow up appointment as identified in the treatment plan
3. Will meet ethical and legal requirements for this procedure
4. Will provide accurate chart entries for this procedure
5. Will utilize OSHA and DBC guidelines for instrument processing, removing waste and cleaning/disinfecting treatment area

The above criteria will be used to evaluate and access appropriate removal of bands with subsequent removal of residual cement with a hand instrument with a minimum of 75% accuracy for laboratory and clinical patients.

General Clinical Practice Protocol

Students will complete procedures on two clinical patients. The following general procedures will occur:

Patient Selection Criteria

The following criteria must apply for each patient:

1. Patient must be an active orthodontic patient
2. Patient must be in good health (medical history form will be completed prior to treatment, reviewed and approved by the instructor).
3. Each patient will have a minimum of four posterior first molars with bands.

The student will function as an operator, an assistant and a patient. Working as partners (operator and assistant) an operator will perform the procedure, the assistant will observe, and evaluate each step of the procedure. When complete each student will do the procedure, observe and evaluate.

The following general procedures will occur for each of the patients:

1. Operatory will be set up following the infection control guidelines
2. Medical history will be completed by the patient prior to seating
3. Equipment and supplies will be checked by the student
4. Patient will be seated and prepared for treatment
5. Student operator will review the medical history and perform a visual exam
6. The instructor will review the medical history and perform a visual exam
7. Instructor will accept the patient for band removal and subsequent cement removal with a hand instrument
8. Student operator will perform the following according to the stated criteria:
    a. Identify teeth with orthodontic bands
    b. Remove orthodontic bands
    c. Remove residual cement with a hand instrument
    d. Coronal polish
    e. Rinse and remove isolation products
    f. Evaluate the product
    g. Provide individualized patient education
    h. Dismiss the patient
    i. Make appropriate chart notes
    j. Perform operatory clean-up/instrument processing according to infection control guidelines

After band removal and subsequent removal of residual cement with a hand instrument procedures, the student operator, student assistant and the instructor complete evaluation using the worksheet and product evaluation form.

During this time period, the following will occur:

1. Student operator will evaluate his/her own work according to stated criteria using worksheet and product evaluation forms.
2. Student assistant will assist, observe, evaluate operator's performance according to stated criteria using the worksheet and product evaluation forms.
3. The instructor will evaluate both students' work according to stated criteria using the worksheet and product evaluation forms. Results will be discussed.

A 75% must be obtained for passage of removal of bands and removal of residual cement with a hand instrument.

General Examination Protocol

Written Examination

A comprehensive written examination of 20 questions on the entire curriculum will be administered. The student must receive a minimum score of 75% on the examination to pass the class. One hour has been reserved for the written examination.

Clinical Final Examination

The clinical final examination occurs during the process of working on the two active orthodontic patients during the removal of orthodontic bands for subsequent removal of residual cement with a hand instrument on four posterior first molars following patient selection criteria and procedures outlined in the module's clinical practice protocol.

Written Examination

1. An orthodontic band is:
    a. A fixed appliance
    b. Stainless steel
    c. Used only on anterior teeth
    d. Generally used on posterior teeth
    e. a, b and d
    f. a, b and c
2. Orthodontic bands attach to the teeth circumferentially like a "ring" around the tooth. Seeing a band going around the tooth especially on the lingual aspect confirms it is a bracket and not a band.
    a. The first statement is false and the second is true
    b. The first statement is true and the second is false
    c. Both statements are true
    d. Both statements are false
3. Orthodontic bands can have a variety of components and attachments. Which of the following are an attachment or component of orthodontic bands?
    a. Bracket or tube that is welded to the band on the buccal
    b. Welded lingual attachments
    c. Rapid palatal expander that is directly welded to the lingual
    d. All of the above
4. Orthodontic brackets are made of stainless steel, translucent ceramic or acrylic.
    a. True
    b. False
5. The primary instrument used in the removal of orthodontic bands is the band removing plier.
    a. True
    b. False
6. The band-removing plier is designed to safely remove the band from the tooth with minimal pressure and discomfort to the patient.
    a. True
    b. False
7. The band-removing plier has a soft, padded portion that is designed to go on the occlusal aspect of the tooth. The other side has a sharp edge that is designed to grab the gingival edge of the band.
    a. The first statement is false and the second is true
    b. The first statement is true and the second is false
    c. Both statements are true
    d. Both statements are false
8. During band removal teeth are often sensitive and may be slightly mobile. In addition, the soft tissue may be inflamed.
    a. The first statement is false and the second is true
    b. The first statement is true and the second is false
    c. Both statements are true
    d. Both statements are false
9. Special care does not have to be taken when removing bands from teeth when they have restorations.
    a. True
    b. False
10. Patients with limited opening can make the use of band removing instruments more difficult because the access to the band is more limited.
    a. True
    b. False
11. Cements used to cement orthodontic bands include glass ionomer that releases fluoride to prevent caries around the band.
    a. True
    b. False
12. The cements used resemble the natural color of tooth structure making it more difficult to identify residual cement. The assistant should use an instrument to feel for residual cement since visual inspection may not be reliable.
    a. The first statement is false and the second is true
    b. The first statement is true and the second is false
    c. Both statements are true
    d. Both statements are false

13. The easiest surface to inspect is usually the lingual surface
    a. True
    b. False
14. Residual cement may be hidden. If it is not removed it could lead to periodontal problems.
    a. The first statement is false and the second is true
    b. The first statement is true and the second is false
    c. Both statements are true
    d. Both statements are false
15. Following band removal the residual subgingival cement is removed with a scaler.
    a. True
    b. False
16. Scalers generally have dull tips. Finger rests (fulcrums) are not necessary while removing residual cement.
    a. The first statement is false and the second is true
    b. The first statement is true and the second is false
    c. Both statements are true
    d. Both statements are false
17. Most cements will come off the enamel in large pieces.
    a. True
    b. False
18. Patients should wear safety glasses during cement removal to protect their eyes.
    a. True
    b. False
19. Our primary focus during band removal and residual cement removal is the patient's comfort and safety
    a. True
    b. False
20. If cement cannot be removed with a scaler the assistant may use the high speed handpiece with a bur.
    a. True
    b. False

Written Examination Answer Key

1. e
2. b
3. d
4. a
5. a
6. a
7. c
8. c
9. b
10. a
11. a
12. c
13. b
14. c
15. a
16. d
17. a
18. a
19. a
20. b

Module 4

Preparing Teeth for Bonding

By: Michael Payne

PERFORMANCE OBJECTIVES

After completing the following areas of didactic, laboratory and clinical instruction in preparing teeth for bonding, the student will be able to:

1. Identify basic key terms and concepts of etching and bonding dental materials
2. Identify the characteristics of etchant and bonding materials and the manipulation and storage of materials
3. Identify the legal requirements associated with etching and bonding application
4. Describe the goals of preparing teeth for bonding of orthodontic brackets
5. Identify the precautions taken to protect the operator and patient related to the bonding materials
6. Describe the role of the bonding materials in the orthodontic practice
7. Describe and identify the armamentaria used for preparation and placement of bonding materials
8. Demonstrate the steps involved in the appropriate preparation, acid etching and bonding of four anterior and four posterior typodont teeth according to the stated criteria
9. Prepare, etch, apply bonding agents, and bond anterior and posterior teeth on a minimum of two clinical patients to a 75% minimum proficiency level
10. Student, partner, and instructor will evaluate all etchant and bonding applications according to the stated criteria. Identify the techniques to improve and or modify faulty placement
11. Maintain infection control protocol, to include operator protection, operatory, surface disinfection or barrier placement and instrument processing/sterilization related to tooth preparation according to standards defined by OSHA and DBC
12. Identify the emergency procedures for the dental training facility, which includes the classroom, laboratory and clinical training areas

On typodont teeth and patients, the student will be able to:

1. Assemble appropriate armamentaria for preparing the tooth for bracket placement
2. Perform coronal polish on the teeth that will be prepared for bracket placement
3. Isolate and dry teeth in areas where teeth will be prepared for bracket placement
4. Prepare etchant and bond according to the manufacturer's recommendations
5. Apply etchant, bonding agent to the four anterior and four posterior typodont teeth four times according to the specified criteria with 75% accuracy (Preparing teeth for bonding and placement of brackets)
6. Apply etchant, bonding agents and composite material on brackets for two active orthodontic patients according to specified criteria with 75% accuracy
7. Evaluate and assess appropriate etchant, bonding agent placement and bracket preparation and placement for laboratory and clinical patient experience with 75% accuracy
8. Maintain appropriate infection control protocol throughout all procedures
9. Protect him/herself and the patient from hazardous situations as defined in the MSDS sheets for etchant and primer

Outline

DIDACTIC SESSION

4 Hours

1. Understanding the Factors for Bonding Success
2. General Concepts in Bonding to Enamel Surfaces
3. Armamentarium
4. Patient Assessment and Education
5. Cleaning Tooth Surfaces
6. Isolation and Moisture Control
7. Acid Etching
8. Acid Etch Removal
9. Rinsing Tooth Surfaces
10. Drying Tooth Surfaces
11. Application of Bonding Primers and Resins
12. Bonding to Enamel vs. Restorative Materials

LABORATORY SESSION – 1

1 Hour

During this session, students will practice the preparation of teeth for bonding with the application materials on typodont teeth using appropriate etchants/primers according to type of enamel or restorative material simulated to be bonded. Students will practice procedures and product applications on a minimum of four typodont teeth for each assigned tooth materials to include enamel, porcelain and plastic tooth materials.

LABORATORY SESSION – 2

1 Hour

Laboratory practice on typodont teeth continues, including specialized products used for bonding atypical enamel, porcelain, plastic, gold etc. and practice protocol for contaminated teeth and indirect bonding. Students will practice applications on a minimum of four typodont teeth for each assigned tooth material to include enamel, porcelain, and plastic tooth materials with one serving as a practical examination.

PRECLINICAL SESSION

2 Hours

During this session, students will practice the preparation of teeth for bonding working on each other in simulation. Taking turns, each student functions as an operator and applies etchant (faux) and bonding materials on four posterior and four anterior teeth with one procedure used as a practical examination.

WRITTEN FINAL EXAMINATION

1 Hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

CLINICAL INSTRUCTION

4 Hours

During this session, the instructor will demonstrate the sequence of tooth preparation for bonding on active patients.

Laboratory, Preclinical and Clinical Instruction

Students will complete study material for Module 4 (preparing teeth for bonding) and Module 5 (bracket placement) prior to proceeding with the laboratory section which will include instruction in the continuum of both procedures.

LABORATORY SESSION 1

1 Hour

During this session, students will practice the preparation of teeth for bonding with the application of materials on typodont teeth using appropriate etchants and primers according to type of enamel or restorative material being bonded.

Typodont Experience

- Practice protocol for bonding to enamel
- Practice protocol for bonding to porcelain
- Practice protocol for bonding to plastic
- Practice protocol for bonding to gold/metal
- Practice protocol for bonding to atypical enamel
- Practice protocol for contaminated tooth

Laboratory Instructions

Students will work with a partner during the process of these procedures. The assisting student will observe each stage of the process for evaluation. The following is a step-by-step description of the procedures that should be followed during the laboratory practice sessions:

1. Each student will set up his/her armamentaria for etchant and bonding placement.
2. Student will be provided with a typodont, a bench mount and four anterior and four posterior typodont teeth. In addition, the student will be provided with individualized packets that will include:
    a. Description of packet
    b. Etchant material in disposable syringe or bottle
    c. Brushes/applicators for etchant application
    d. Liquid wells or disposable sheets for dispensing materials
    e. Bonding agent/primer in bottle or disposable syringe
3. Instructor will review procedures and present information on how to use worksheet for etchant and bonding placement.
4. Instructor will present criteria for ideal etchant, bonding resin placement. Instructor will provide ideal examples that will be passed around for viewing.
5. Student will place etchant on typodont tooth, partner observes, evaluates and records on worksheet. Student will also evaluate him/herself on the procedure. Instructor evaluates the etching process. The entire process will continue to be evaluated on the worksheet by the student, partner/assistant and instructor.
6. Partners switch places, the operator becomes the assistant, and the assistant becomes the operator. Both students complete three typodont teeth.
7. Instructor will now present product evaluation form and how it is used to evaluate final etchant and bonding application.
8. Using the product evaluation form, the student operator and the student assistant and instructor grade the final etchant, bonding process for each other.
9. Discussion on product evaluation is conducted in small groups

LABORATORY SESSION 2

1 Hour

Laboratory practice on typodont teeth continues but now for specialized products used for bonding atypical enamel, porcelain, plastic, gold etc. and practice protocol for contaminated teeth.

PRECLINICAL SESSION

2 Hours

During this session, student partners work on each other in simulation as described and demonstrated by instructor. The following general procedures will occur:

Working with a partner, each student functions as an operator and applies etchant (faux) and bonding materials. Student will then function as an assistant, observe and evaluate placement with partner.

The following general procedures will occur for each patient:

1. Operatory will be set up following the infection control guidelines.
2. Medical history will be completed by student/patient prior to seating.
3. Equipment and supplies will be checked by student.
4. Student/patient will be seated and prepared for treatment.
5. Student operator will review medical history and perform a patient assessment; instructor will follow-up with same procedures.
6. Patient is given instructions/explanation of procedures.
7. Student operator will perform the following according to the stated criteria:
    a. Perform coronal polish
    b. Isolate one quadrant and dry
    c. Perform etchant (faux/simulated product) application procedures
    d. Suction "etchant" from tooth
    e. Rinse and dry etched tooth/teeth
    f. Apply primer/bonding material(s)
    g. Cure material (2 seconds only during simulation for easy removal)
    h. Apply composite resin material
    i. Cure composite resin material
    j. Evaluate product using ideal criteria
    k. Give patient post-op instructions
    l. Dismiss patient
    m. Perform operatory clean-up according to infection control guidelines

During the procedure, the following will take place:

1. The student/operator will evaluate his/her own work according to stated criteria using the worksheet and product evaluation forms.
2. The student/assistant will assist, observe and evaluate operator's performance according to criteria using the worksheet and product evaluation forms.
3. The instructor will evaluate both student's work/performance using stated criteria using the worksheet and product evaluation forms. Discussion on results will be conducted.
4. The instructor will demonstrate and explain clinical examination protocol. When student performs last procedure on student partner it will be termed "mock exam" in preparation for the final exam on a clinical patient.

WRITTEN FINAL EXAMINATION

1 hour

CLINICAL SESSION – MODULE 4 AND 5

4 hours

During this session, the instructor will demonstrate the sequence of tooth preparation for bonding on active patients.

The following procedures will be demonstrated:

1. Perform coronal polish
2. Isolate one quadrant and dry
3. Perform etchant application procedures
4. Suction etchant from tooth
5. Rinse and dry etched tooth/teeth
6. Apply primer/bonding material(s)
7. Cure material
8. Apply composite resin material
9. Cure composite resin material

Student experience on active patients will include preparation for subsequent bracket bonding on four anterior and four posterior teeth a minimum of four times each, with one of each of the four times used for a practical exam.

The following general procedures will occur for each patient:

1. Operatory will be set up following the infection control guidelines.
2. Medical history will be completed by the patient prior to seating.
3. Equipment and supplies will be checked by student/operator.
4. The patient will be seated and prepared for treatment.
5. Student operator will review medical history and perform a patient assessment; instructor will follow-up with same procedures.
6. Patient is given instructions/explanation of procedures.
7. Student operator will perform the following according to the stated criteria:
    a. Perform coronal polish
    b. Isolate one quadrant and dry
    c. Perform etchant application procedures
    d. Suction etchant from tooth.
    e. Rinse and dry etched tooth/teeth
    f. Apply primer/bonding material(s)
    g. Cure material
    h. Apply composite resin material
    i. Cure composite resin material
    j. Evaluate product using ideal criteria
    k. Give patient post-op instructions
    l. Dismiss patient
    m. Perform operatory clean-up according to infection control guidelines

After the student operator completes the sequence of procedures, the student operator, the assistant and the instructor will evaluate the performance of the student operator using the worksheet and product evaluation.

During this time period the following procedures will occur:

1. The student/operator will evaluate his/her own work according to stated criteria using the worksheet and product evaluation forms.
2. The student/assistant will assist, observe and evaluate operator's performance according to criteria using the worksheet and product evaluation forms.
3. The instructor will evaluate both students' work/performance using stated criteria using the worksheet and product evaluation forms. Discussion on results will be conducted.

Worksheets

LABORATORY & CLINICAL PATIENT WORKSHEETS

General Information on Worksheets

The student operator, student assistant, and instructor use these forms. Each of these individuals will watch the performance of the specified steps of the given procedure and then identify if any of these steps are not followed and/or inadequately performed by the student operator. During the learning process, errors can and will occur. Students and clinical instructors identify common errors encountered during each step of the entire procedure utilizing the worksheets. Worksheets are not grade sheets, but they assist the student to identify his or her own errors during performance of these steps. They are used for measuring student's progress toward attainment of clinical proficiency.

General Procedures

An important part of the learning experience in the processes of preparing teeth for bonding and bracket placement and removal is the ability to identify technique errors, understand their causes and find solutions. Equally important is to determine the degree of error and when it constitutes a need to redo the procedure. The first step in this process is to identify the error(s). Using the Laboratory and Clinical Patient Worksheets does this. The worksheets are not grade sheets but are documents that are used to assist students in learning to identify common technique errors related to the procedures associated with preparing teeth for bonding and bracket placement and removal. The student uses this form in the following manner:

The worksheet consists of a column titled Procedure-Laboratory and Procedure-Clinical, which is the step-by-step description of the procedures associated with preparing teeth for bonding and bracket placement and removal. The procedures are subdivided into the following categories:

- Infection Control/Patient Safety
- Assemble Armamentaria
- Fitting
- Trimming
- Ligating
- Patient Education
- Infection Control/Patient Safety/Clean-up

How Worksheets Are Used by Student Operator and Student Assistant

1. When performing multiple procedures either in the laboratory or on clinical patients, all of the errors from these series are placed on one worksheet.
2. Each laboratory/clinical experience is graded in a different column.
3. When an error occurs in any of the individual steps described in the Procedure column, a check is placed in the box corresponding to the laboratory/clinical experience.

For example, on the clinical patient worksheet there would be a box for each step of the clinical practice patients. For the laboratory worksheet, there would be a box for the typodont teeth. With worksheet check-offs, the student can identify a clustering pattern of errors in any particular step. When an instructor evaluates the student's performance, he/she cannot only see how a student performs, but whether or not the student can identify errors that he/she makes.

How the Student Identifies Cause and the Correction of Errors

After the student identifies the error(s) performed, he/she will write the cause of the error and how it shall be rectified.

How the Instructor Uses the Worksheets

The instructor watches the student operator during the entire process. The instructor will check the appropriate box on the same worksheet used by the student operator and the student assistant. The instructor observes both students, and then evaluates the grading completed by both students for accuracy. The instructor reviews the worksheets for information related to: cause, solution and whether any part of the procedure requires additional steps. The instructor can provide additional assistance where needed. This process of identification of errors, causes and solutions will ensure the student will progress towards clinical competence and expected course objectives will be met. This process will continue throughout all laboratory and clinical requirements. When the clinical final exam is administered the student should be clinically competent in the stated procedure.

Satisfactory Performances of Psychomotor Skills

Students will practice psychomotor skills during the laboratory and preclinical sessions until they reach a competence level of 75% utilizing the documented criteria evaluated using the behaviorally anchored rating scale. Students must achieve a passing score on a minimum of two typodont teeth or natural teeth before progressing on to successive laboratory, preclinical and clinical sessions.

Modules 4 and 5 have been combined on the laboratory and preclinical worksheets as these procedures would be combined in the educational setting and bracket bonding would be followed by bracket removal.

Worksheet – Laboratory/Preclinical

BRACKET PREPOSITIONING, BOND CURING & REMOVAL OF ORTHODONTIC BRACKETS

Date:

Student/Operator Name:

Student/Assistant Name:

Faculty Name:

Minimum of 4 anterior teeth to be prepared, brackets bonded and removed. Record tooth number(s):

Minimum of 4 posterior teeth to be prepared, brackets bonded and removed. Record tooth number(s):

Use this worksheet to identify errors in procedures. Place a check mark in the box each time a step in the procedure is incorrectly performed or omitted. After each section, the instructor will check before the student continues with the following section.

*** = Critical error**

Infection Control/Armamentarium	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
Infection Control/Patient Safety			
1. Barriers placed on chair, unit, air-water syringe, HVE, saliva ejector, SP hand piece, curing light			
2. PPE: mask, gloves, scrubs, gown, eye wear, patient safety glasses			
Assemble Armamentaria			
3. Basic set-up: mirror, explorer, cotton pliers			
4. Air-water syringe, syringe tip, HVE, saliva ejector			
5. Low-speed hand piece with disposable prophy angle			
6. Pumice/prophy paste without fluoride or oil			

7. Isolation products-long and short cotton rolls, dri-aids, dry angles, cheek retractors, tongue guard, etc.			
8. Etchant, primer, bonding agent, materials required for bonding to dental restorations			
9. Curing light, tinted safety glasses or shield			
10. Typodont with appropriate teeth and bench mount/pole			
11. High speed hand piece for roughening surface of restoration			
12. Micro-etcher for roughening surface of restoration			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Tooth Preparation	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
13. Verify teeth to be prepared for bonding*			
14. Remove plaque/pellicle from teeth with non-fluoridated/flavored prophy paste = orthodontic prophy paste			
15. Rinse and suction Use explorer to check surface of the tooth to be sure there is no calculus or remaining pumice Rinse again and dry			
16. Isolate with appropriate cotton rolls, holders etc.*			
17. Completely dry teeth and maintain isolation			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Etchant Placement	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
18. Place etchant onto surface to be sealed, covering an area larger than the bracket base, avoiding excessive amounts*			
19. Allow etchant to remain on teeth 15-30 seconds or increase for highly mineralized enamel and or primary teeth			

20. Thoroughly rinse, removing etchant, while keeping teeth isolated If teeth become contaminated, re-etch 10-15 seconds			
21. Thoroughly rinse surface for 20-30 seconds followed by drying for at least 20 seconds* Etch pattern should appear frosty or a matte finish for enamel Etch pattern will not appear on typodont teeth			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Bonding and Curing	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
22. Apply thin layer of bonding agent to the prepared surface where the bracket will be placed* Apply light stream of air for 10 seconds			
23. Polymerize the bonding agent* Hold curing light as close to surface without actually touching material Standard curing light 10 seconds, high-energy light-5 seconds			
24. Apply bracket cement to base working into bracket mesh*			
25. Polymerize the composite resin material * Standard curing light 20 seconds, high- energy light-10 seconds once position confirmed by orthodontist			
26. Bracket is bonded to tooth as stated in bonding bracket module/section*			
27. Check for voids in composite resin material and proper placement of bracket			
28. Remove isolation materials, rinse and dry			
29. Patient education (not provided for typodont but student could practice dialogue that would be used during clinical experience)			

Bracket Removal	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
30. Prepare patient for bracket removal with instructions on what patient may experience during procedure			
31. Will remove brackets with bracket removing pliers			
32. Will support tooth to minimize patient discomfort while applying pliers pressure and occlusal rotation to remove bracket			
Patient Education	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
33. Give post-operative instructions to the patient or parent			
34. Document procedure in patient chart to include: date, HH review or update, materials used, operator signature, and instructor or DDS signature			
Infection Control/Patient Safety/Clean-Up	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
35. Remove barriers from chair, light, air- water syringe, hoses, HVE, saliva ejector, handpiece			
36. Surface disinfect			
37. Prepare and institute sterilization procedures			
38. Manage PPE: gloves, mask, gown, scrubs, eye wear and patient safety glasses			
39. Unit is checked for completion			

Comments:

STUDENT OPERATOR EXPLANATION OF CHECKMARKS

Procedure #s

Cause(s)

Solution(s)

Re-do? Yes No Tooth #s

Worksheet – Clinical Patient

BRACKET PREPOSITIONING, BOND CURING & REMOVAL OF ORTHODONTIC BRACKETS

Date:

Student/Operator Name:

Student/Assistant Name:

Faculty Name

Circle one: Patient #1 Patient #2

Patient Name:

Minimum of 4 anterior teeth to be prepared, brackets bonded and removed. Record tooth number(s):

Minimum of 4 posterior teeth to be prepared, brackets bonded and removed. Record tooth number(s):

Use this worksheet to identify errors in procedures. Place a check mark in the box each time a step in the procedure is incorrectly performed or omitted. After each section, the instructor will check before the student continues with the following section.

*** = Critical Error**

Infection Control/Armamentarium	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
Infection Control/Patient Safety			
1. Barriers placed on chair, unit, air-water syringe, HVE, saliva ejector, SP hand piece, curing light			
2. PPE: mask, gloves, scrubs, gown, eye wear, patient safety glasses			
Assemble Armamentaria			
3. Basic set-up: mirror, explorer, cotton pliers			
4. Air-water syringe, syringe tip, HVE, saliva ejector			
5. Low-speed hand piece with disposable prophy angle			
6. Pumice/prophy paste without fluoride or oil			
7. Isolation products-long and short cotton rolls, dri-aids, dry angles, cheek retractors, tongue guard, etc.			

8. Etchant, primer, bonding agent, materials required for bonding to dental restorations			
9. Curing light, tinted safety glasses or shield			
10. High speed hand piece for roughening surface of restoration			
11. Micro-etcher for roughening surface of restoration			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Tooth Preparation	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
12. Verify teeth to be prepared for bonding*			
13. Remove plaque/pellicle from teeth with non-fluoridated/flavored prophy paste = orthodontic prophy paste			
14. Rinse and suction Use explorer to check surface of the tooth to be sure there is no calculus or remaining pumice Rinse again and dry			
15. Isolate with appropriate cotton rolls, holders etc.*			
16. Completely dry teeth and maintain isolation			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Etchant Placement	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
17. Place etchant onto surface to be sealed, covering an area larger than the bracket base, avoiding excessive amounts*			
18. Allow etchant to remain on teeth 15-30 seconds or increase for highly mineralized enamel and or primary teeth			
19. Thoroughly rinse, removing etchant, while keeping teeth isolated If teeth become contaminated, re-etch 10-15 seconds			

20. Thoroughly rinse surface for 20-30 seconds followed by drying for at least 20 seconds* Etch pattern should appear frosty or a matte finish for enamel Etch pattern will not appear on typodont teeth			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Bonding and Curing	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
21. Apply thin layer of bonding agent to the prepared surface where the bracket will be placed* Apply light stream of air for 10 seconds			
22. Polymerize the bonding agent* Hold curing light as close to surface without actually touching material Standard curing light 10 seconds, high-energy light-5 seconds			
23. Apply bracket cement to base working into bracket mesh*			
24. Polymerize the composite resin material * Standard curing light 20 seconds, high- energy light-10 seconds once position confirmed by orthodontist			
25. Bracket is bonded to tooth as stated in bonding bracket module/section*			
26. Check for voids in composite resin material and proper placement of bracket			
27. Remove isolation materials, rinse and dry			
28. Patient education (not provided for typodont but student could practice dialogue that would be used during clinical experience)			
Bracket Removal	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
29. Prepare patient for bracket removal with instructions on what patient may experience during procedure			
30. Will remove brackets with bracket removing pliers			
31. Will support tooth to minimize patient discomfort while applying pliers pressure and occlusal rotation to remove bracket			

Patient Education	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
32. Give post-operative instructions to the patient or parent			
33. Document procedure in patient chart to include: date, HH review or update, materials used, operator signature, and instructor or DDS signature			
Infection Control/Patient Safety/Clean-Up	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
34. Remove barriers from chair, light, air- water syringe, hoses, HVE, saliva ejector, handpiece			
35. Surface disinfect			
36. Prepare and institute sterilization procedures			
37. Manage PPE: gloves, mask, gown, scrubs, eye wear and patient safety glasses			
38. Unit is checked for completion			

Comments:

STUDENT OPERATOR EXPLANATION OF CHECKMARKS

Procedure #s

Cause(s)

Solution(s)

Re-do? Yes No Tooth #s

Product Evaluation Forms

BRACKET PREPOSITIONING, BOND CURING & REMOVAL OF ORTHODONTIC BRACKETS

General Procedures

Product evaluation evaluates the end result of any performance, not the steps. This facility utilizes the behaviorally anchored rating scale (BARS) system. This 10-point system clusters the critical incidents into categories. The instructor can score objectively the end result of each procedure by choosing the criteria specified in each point level. Performance is assessed according to established criteria for each of these procedures. The points are then converted to a pass or fail grade.

How Instructor Uses Product Evaluation Form

A product evaluation form will be used for each patient. In the "scores" area on the form you will note that an open box rather than specific grids occurs. This open box allows you to enter a score for each of the posterior first molars.

The student must maintain a minimum point value of 7.5 on all clustered critical incidences per tooth. He/she must receive this minimum score for all four posterior first molars selected for orthodontic band removal and cement removal with a hand instrument in order to pass this module. A grade of 7.5 represents a 75% passing score.

Product Evaluation Point Conversion

The student will receive points for a given level of achievement from the point scale utilized for product evaluation.

POINT SYSTEM TO A PASS/ FAIL SCORE

Conversion

Points	Grades
10	➨ Pass-Excellent
7.5	➨ Pass
5	➨ Fail-Critical Error(s)
3	➨ Fail-Critical Errors-no concept

Product Evaluation/Practical Examination – Lab Session 1

BRACKET PREPOSITIONING, BOND CURING & REMOVAL OF ORTHODONTIC BRACKETS

Student Name:

Patient Name: Typodont

Minimum number of satisfactory performances:

4 anterior teeth to be prepared for bonding brackets. Record tooth number(s):

4 posterior teeth to be prepared for bonding brackets. Record tooth number(s):

PREPARATION AND ETCHANT

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores *(Enter a score for anterior/posterior)*	Comments
Preparation of Field A. Teeth are free of stains/plaque B. Coronal polish/teeth pre-cleaning C. Isolation of selected area **Etching** A. Etchant application B. Etchant removal		

PLACEMENT OF MAETIALS FOR BONDING BRACKETS

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores *(Enter a score for anterior/posterior)*	Comments
Bonding/Primer/Composite Application A. Assemble armamentarium B. Identify and select bracket types for each tooth C. Properly clean tooth surface D. Avoid contamination of bracket bases E. Apply bonding material to bracket base F. Preposition brackets G. Brackets cured after evaluation by instructor H. Postoperative instructions reviewed I. Prepare patient for bracket removal with instructions of what patient may experience during procedure J. Will remove brackets with bracket removing pliers K. Will support tooth to minimize patient discomfort while applying pliers pressure and occlusal rotation to remove bracket		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation/Practical Examination – Lab Session 2

BRACKET PREPOSITIONING, BOND CURING & REMOVAL OF ORTHODONTIC BRACKETS

Student Name:

Patient Name: Typodont

Minimum number of satisfactory performances:

4 anterior teeth to be prepared for bonding brackets. Record tooth number(s):

4 posterior teeth to be prepared for bonding brackets. Record tooth number(s):

PREPARATION AND ETCHANT

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores *(Enter a score for anterior/posterior)*	Comments
Preparation of Field A. Teeth are free of stains/plaque B. Coronal polish/teeth pre-cleaning C. Isolation of selected area **Etching** A. Etchant application B. Etchant removal		

PLACEMENT OF MAETIALS FOR BONDING BRACKETS

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores *(Enter a score for anterior/posterior)*	Comments
Bonding/Primer/Composite Application A. Assemble armamentarium B. Identify and select bracket types for each tooth C. Properly clean tooth surface D. Avoid contamination of bracket bases E. Apply bonding material to bracket base F. Preposition brackets G. Brackets cured after evaluation by instructor H. Postoperative instructions reviewed I. Prepare patient for bracket removal with instructions of what patient may experience during procedure J. Will remove brackets with bracket removing pliers K. Will support tooth to minimize patient discomfort while applying pliers pressure and occlusal rotation to remove bracket		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation/Practical Examination – Preclinical Session

BRACKET PREPOSITIONING, BOND CURING & REMOVAL OF ORTHODONTIC BRACKETS

Student Name:

Patient Name:

Minimum number of satisfactory performances:

4 anterior teeth to be prepared for bonding brackets. Record tooth number(s):

4 posterior teeth to be prepared for bonding brackets. Record tooth number(s):

PREPARATION AND ETCHANT

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores *(Enter a score for anterior/posterior)*	Comments
Preparation of Field A. Teeth are free of stains/plaque B. Coronal polish/teeth pre-cleaning C. Isolation of selected area **Etching** A. Etchant application B. Etchant removal		

PLACEMENT OF MAETIALS FOR BONDING BRACKETS

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores *(Enter a score for anterior/posterior)*	Comments
Bonding/Primer/Composite Application A. Assemble armamentarium B. Identify and select bracket types for each tooth C. Properly clean tooth surface D. Avoid contamination of bracket bases E. Apply bonding material to bracket base F. Preposition brackets G. Brackets cured after evaluation by instructor H. Postoperative instructions reviewed I. Prepare patient for bracket removal with instructions of what patient may experience during procedure J. Will remove brackets with bracket removing pliers K. Will support tooth to minimize patient discomfort while applying pliers pressure and occlusal rotation to remove bracket		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation/Practical Examination – Clinical Session

BRACKET PREPOSITIONING, BOND CURING & REMOVAL OF ORTHODONTIC BRACKETS

Student Name:

Patient Name:

Minimum number of satisfactory performances:

4 anterior teeth to be prepared for bonding brackets. Record tooth number(s):

4 posterior teeth to be prepared for bonding brackets. Record tooth number(s):

PREPARATION AND ETCHANT

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores *(Enter a score for anterior/posterior)*	Comments
Preparation of Field A. Teeth are free of stains/plaque B. Coronal polish/teeth pre-cleaning C. Isolation of selected area **Etching** A. Etchant application B. Etchant removal		

PLACEMENT OF MAETIALS FOR BONDING BRACKETS

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores *(Enter a score for anterior/posterior)*	Comments
Bonding/Primer/Composite Application A. Assemble armamentarium B. Identify and select bracket types for each tooth C. Properly clean tooth surface D. Avoid contamination of bracket bases E. Apply bonding material to bracket base F. Preposition brackets G. Brackets cured after evaluation by instructor H. Postoperative instructions reviewed I. Prepare patient for bracket removal with instructions of what patient may experience during procedure J. Will remove brackets with bracket removing pliers K. Will support tooth to minimize patient discomfort while applying pliers pressure and occlusal rotation to remove bracket		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation Documented Criteria

PREPARING TEETH FOR BONDING

PREPARATION & ETCHING	
Evaluation Criteria	
Points	**Description**
10 Points	➨ Teeth are clean and coronally polished ➨ Field is totally isolated and maintained dry throughout procedure ➨ Etchant is carefully applied and time is precisely monitored ➨ Etchant is carefully and completely rinsed ➨ Enamel surface appears white, opaque, and frosty
7.5 Points	➨ Teeth are relatively clean and coronal polish is acceptable ➨ Field is isolated and maintained dry during procedure ➨ Etchant timing and placement vary slightly from ideal ➨ Etchant removal is adequate ➨ Enamel surface appears adequately white, opaque and frosty
5 Points	➨ Teeth have not been cleaned ➨ Isolation of tooth is faulty and saliva penetrates area ➨ Etchant placement and timing are careless/Gingival areas are involved in etching process ➨ Removal of etchant is careless and inadequate ➨ Enamel surface appears either smooth or normal color
3 Points	➨ Teeth have not been cleaned and stain remains. Debris and plaque are plainly visible. ➨ Saliva washes over field during etching. Isolation fails. ➨ No attempt is made to time etchant application/No attempt is made to confine etchant to application area/Gingival areas are grossly affected by etching material ➨ Removal of solution is very poor. ➨ Enamel surface appears grossly mottled, pitted, or irregular.

Product Evaluation Documented Criteria

BRACKETS PREPOSITIONING, BOND CURING & BRACKET REMOVAL

MATERIAL PLACEMENT	
Evaluation Criteria	
Points	**Description**
10 Points	➨ Material is carefully prepared according to manufacturer's directions ➨ Contamination of bracket base avoided with careful technique ➨ Material is evenly applied well incorporated into bracket mesh ➨ Polymerization time is carefully monitored ➨ Confinement of material within bracket base ideal
7.5 Points	➨ Material is prepared to manufacturer's directions reasonably accurately ➨ Contamination of bracket base avoided ➨ Material is acceptably incorporated into bracket mesh/Thickness may vary slightly from ideal ➨ Polymerization time is adequate ➨ Material placed within confines of bracket base with minor discrepancies
5 Points	➨ Material is carelessly handled ➨ Student touches bracket base contaminating surface ➨ Material is not well incorporated into bracket mesh/Thickness is uneven, irregular, or in excess ➨ Material goes outside boundaries of bracket base ➨ Polymerization time is not monitored/composite not completely hardened
3 Points	➨ Material is crudely manipulated and dispensed ➨ Student touches bracket base contaminating surface ➨ Material placement in bracket mesh poor/The coverage area is insufficient which will result in bracket failure ➨ Material goes outside boundaries of bracket base ➨ Poor attention to polymerization times

Product Evaluation Documented Criteria

BRACKETS PREPOSITIONING, BOND CURING & BRACKET REMOVAL

BRACKET REMOVAL	
Evaluation Criteria	
Points	**Description**
10 Points	► Clear description for bracket removal given to prepare patient ► Properly support tooth to minimize patient discomfort while applying pliers pressure and occlusal rotation to remove bracket
7.5 Points	► Clear description for bracket removal given to prepare patient ► Adequately support teeth to minimize patient discomfort while applying pliers pressure and occlusal rotation to remove bracket
5 Points	► Adequate description for bracket removal given to prepare patient ► Provided support to tooth though mild patient discomfort while applying pliers pressure and occlusal rotation to remove bracket
3 Points	► Poor description for bracket removal given to prepare patient ► Tooth unsupported during bracket removal causing discomfort to patient with inadequate occlusal rotation to remove bracket

Course Requirements

The following is an overview of the course requirements and the protocol followed for laboratory and clinical practice, the written and clinical examination.

Minimum Number of Satisfactory Performances

All students will perform at a minimum the following procedures in order to achieve minimum competence in the various protocols used in the preparation of teeth for bonding brackets:

On a typodont and patients, the student will perform the following under OSHA and DBC guidelines:

- On the typodont: apply etchant and other appropriate materials for subsequent bracket bonding on four anterior and four posterior typodont teeth a minimum of four times each, with one used for a practical exam according to the specified criteria.
- On the patient: Apply etchant in preparation for bracket bonding on four anterior and four posterior teeth a minimum of four times each on at least two patients according to the specified criteria with one of each of the four times used for a practical examination with 75% accuracy.

Students are required to meet the specified minimal number of satisfactory performances as indicated above. The student operator grades his/her own performance, the student assistant grades the performance of the student operator and the instructor will assess the student operator's performance and the grading method of both students.

When the student reaches the 75% minimum performance for preparing the tooth for subsequent bracket bonding and 100% performance on all infection control protocol, the instructor evaluates the procedure for the minimal number of satisfactory performances. If a student does not fulfill the minimum grade for the number of satisfactory performances additional laboratory and/or clinical practice procedures will be assigned.

Objective Evaluation Criteria

Objective evaluation criteria shall be provided to each student prior the performance of any procedure. The student will receive information provided by the instructor prior to performing any laboratory or clinical procedures. The instructor shall supply the student with general program, individualized cognitive and psychomotor objectives and criteria for evaluation. Objective criteria will be utilized in the performance of all laboratory and clinical requirements.

Preparation Prior to Etching

1. Will review the medical/dental history, make a general assessment, and oral inspection on each patient prior to treatment, checking for information that may contraindicate the performance of the procedure. Criteria for choosing specific materials for preparing surface for bonding brackets:
    a) Indications
        i) Enamel
        ii) Gold
        iii) Porcelain
        iv) Amalgam
        v) Plastic/composite
    b) Contraindications
        i) Tooth surface with caries
2. Will set up the required armamentaria for coronal polish, etchant and other bonding materials for subsequent bracket bonding
3. Will use aseptic techniques according to OSHA and DBC throughout performance on all patients
4. Will place protective barriers, seat and position the patient
5. Will evaluate the teeth scheduled to be prepared for bonding for subsequent bonding of brackets
6. Will explain to patient the treatment planned for that day
7. Will perform coronal polish on the teeth, ensuring a completely cleaned surface
8. Will isolate, thoroughly clean and dry, four anterior teeth and four posterior teeth prior to application of etchant and bonding materials for subsequent bonding brackets

Etching Criteria

1. Will apply etchant material according to the manufacturer's directions covering the target area of the tooth while avoiding excess amounts over areas of the tooth where the bracket will not be bonded (interproximal); the etchant shall remain in place for 15-30 seconds (average)
2. Will rinse thoroughly etched area for 20-30 seconds with a steady stream of water
3. Will dry thoroughly for at least 20 seconds
4. Will ensure that the etched surface appears dull, matte, chalky, frosty-white

Placing Bonding Agents Criteria

1. Isolated and etched teeth will be rechecked prior to subsequent application of bonding agents
2. Materials will be prepared/dispensed according to manufacturer's directions
3. Overuse of all materials will be avoided
4. Care will be taken to use thin layer of bonding agents
5. Holding the curing light as close as possible without touching the material expose the bond agent for polymerization as directed by manufacturer
6. The isolation material will be removed
7. If excess material is present, it will be removed with a hand instrument or an ultrasonic scaler
8. Will evaluate etchant and preparation of teeth for bonding with subsequent bracket placement procedures, identify problem-solving methods to improve or modify procedures

General Criteria

1. Will provide pertinent and individualized patient education
2. Will provide follow up appointment to evaluate bracket retention
3. Will meet ethical and legal requirements for this procedure
4. Will provide accurate chart entries for this procedure
5. Will utilize OSHA and DBC guidelines for instrument processing, removing waste and cleaning/disinfecting treatment area

The above criteria will be used to evaluate and assess appropriate use of materials with subsequent bracket placement with a minimum of 75% accuracy for laboratory and clinical patients.

General Clinical Practice Protocol

Students will have their first clinical practice by preparing four anterior and four posterior teeth a minimum of four times each, with one of each of the four times used for a clinical exam. They will also complete procedures on two clinical patients. The following general procedures will occur:

Patient Selection Criteria

The following criteria must apply for each patient:

1. Patient must be an active orthodontic patient
2. Patient must be in good health (medical history form will be completed prior to treatment, reviewed and approved by the instructor).
3. Each patient will have a minimum of four anteriors and four posteriors per arch for tooth preparation with subsequent bonding of brackets

The student will function as an operator, an assistant and a patient. Working as partners (operator and assistant) an operator will perform the procedure, the assistant will observe, and evaluate each step of the procedure. When complete each student will do the procedure, observe and evaluate.

The following general procedures will occur for each of the patients:

1. Operatory will be set up following the infection control guidelines
2. Medical history will be completed by the patient prior to seating
3. Equipment and supplies will be checked by the student
4. Patient will be seated and prepared for treatment
5. Student operator will review the medical history and perform a visual exam
6. The instructor will review the medical history and perform a visual exam
7. Instructor will accept the patient for preparation of teeth for subsequent bonding

8. Student operator will perform the following according to the stated criteria:
    a. Perform coronal polish
    b. Isolate and dry
    c. Perform etchant application and procedure
    d. Rinse and dry etched tooth/teeth
    e. Employ additional bonding materials for specific needs
    f. Cure bonding resin for subsequent bracket placement
    g. Evaluate the product
    h. Provide individualized patient education
    i. Dismiss the patient
    j. Make appropriate chart notes
    k. Perform operatory clean-up/instrument processing according to infection control guidelines

After etchant and bonding for subsequent bracket bonding procedures, the student operator, student assistant and the instructor complete evaluation using the worksheet and product evaluation form.

During this time period, the following will occur:

1. Student operator will evaluate his/her own work according to stated criteria using worksheet and product evaluation forms.
2. Student assistant will assist, observe, evaluate operator's performance according to stated criteria using the worksheet and product evaluation forms.
3. The instructor will evaluate both students' work according to stated criteria using the worksheet and product evaluation forms. Results will be discussed.

A 75% must be obtained for passage of preparing teeth/ bonding brackets on a practice patient and a minimum of two clinical patients.

General Examination Protocol

Written Examination

A comprehensive written examination of 50 questions on the entire curriculum will be administered. The student must receive a minimum score of 75% on the examination to pass the class. One hour has been reserved for the written examination.

Clinical Final Examination

The clinical final examination occurs during the process of working on the two active orthodontic patients during the preparation of teeth for subsequent bonding following patient selection criteria and procedures outlined in the module's clinical practice protocol.

Written Examination

1. A patient history is always necessary before coronal polishing because patients might have or be:
   a. Immunosuppressed
   b. Respiratory or pulmonary diseases
   c. Allergies
   d. All of the above
2. The following ingredient should not be included in polishing paste when performing a coronal polish prior to placing etchant:
   a. Fluoride
   b. Silicon dioxide
   c. Glycerin
   d. Pumice
3. Successful bonding technique is an absolute necessity in orthodontics.
   a. True
   b. False
4. The goal is to create a thin surface layer of bonded resin on the tooth that is tightly bound and sealed.
   a. True
   b. False
5. No option that has yet been tested is as efficient and as effective as phosphoric acid for etching tooth structure.
   a. True
   b. False
6. The phosphoric acid strength commonly used in orthodontics is 50%.
   a. True
   b. False
7. Prophylaxis of the enamel surfaces removes plaque, food particles and surface minerals.
   a. True
   b. False
8. The Wharton's duct opens adjacent to the maxillary second molars.
   a. True
   b. False
9. The Stenson's duct opens under the tongue adjacent to the lower anterior teeth:
   a. True
   b. False
10. The following are major salivary glands found in the oral cavity except the:
    a. Sublingual gland
    b. Parotid gland
    c. Lachrymal gland
    d. Submandibular gland
11. The vestibule lies between the tongue and the mandible.
    a. True
    b. False
12. The parotid gland is more of an isolation concern when preparing teeth for bracket placement on tooth number 3 and 14. If a dri-aid or dry angle is used it should not be an issue.
    a. Both statements are true
    b. Both statements are false
    c. The first statement is true the second is false
    d. The first statement is false the second is true
13. Bond failures are directly related to:
    a. Bond strengths
    b. When any of the steps are missed or inadequately followed
    c. Brackets dislodging prematurely
    d. All of the above
14. After tooth surfaces are polished, plaque forms within minutes.
    a. True
    b. False
15. Buonocore observed adhesion to metal surfaces by paints improved when acids were used to etch thus increasing strength of bond in:
    a. 1940
    b. 1945
    c. 1950
    d. 1955

16. When using acid etch the operator should wear safety glasses and gloves. The patient should wear safety glasses and be allowed to lick the etchant.
    a. Both statements are true
    b. Both statements are false
    c. The first statement is true and the second is false
    d. The first statement is false and the second is true
17. Important factors related to effective bonding of brackets include understanding processes and ability to maintain good isolation. The patient's cooperation and good access into the mouth also determines success of bonding brackets.
    a. Both statements are false
    b. The first statement is true the second is false
    c. The first statement is false the second is true
    d. Both statements are true
18. Methods of isolation prior to bracket placement include:
    a. Cheek retractors and cotton rolls
    b. Tongue guards and saliva ejectors
    c. Dry angles
    d. All of the above
    e. a and b only
19. During the etching process the etchant comes in contact with the eyes, the first aid measures should include rinsing with copious amounts of water for:
    a. Five minutes
    b. Ten minutes
    c. Fifteen minutes
    d. Twenty minutes
20. The etchant used for etching enamel in orthodontics include all of the following except:
    1. 50% Phosphoric Acid
    2. 10% Phosphoric Acid
    3. 37% Phosphoric Acid
    4. 10% Hydrofluoric Acid
    5. Plastic conditioner
    a. Only number 4
    b. 1, 2, and 3
    c. 2, 3, and 4
    d. 1, 2, 3, 4, and 5
    e. 1, 2, 4, and 5
21. You have just bonded a bracket on tooth number 30 and when checked you determine the bracket is easily dislodged from the tooth. Which of the following are likely causes:
    1. Saliva contamination occurred following the etching procedure
    2. The pumice used to clean the tooth surface contained fluoride
    3. The pumice you used contained glycerin liquid
    4. The light-curing unit was not producing enough light
    a. 1, 2, 3 and 4
    b. 1, 2, and4
    c. 2, 3, and 4
    d. 3 and 4
    e. 1, 3 and 4
22. If a tooth becomes contaminated after etchant removal, but before bonding you would proceed with bonding; a little saliva should not be a problem.
    a. True
    b. False

23. After acid etching the tooth an appropriate amount of time the tooth surface should appear:
    1. Chalky
    2. Glossy
    3. Dull
    4. Frosty-white
    5. Matte
        a. 1 only
        b. 1, 2 and 3
        c. 1,3,4 and 5
        d. 2, 4 and 5
24. For optimal cured bonded brackets the curing-light tip is placed:
    a. Should contact the band/bonding material
    b. Should contact the bonding material
    c. 3-5 mm from the bonding material
    d. 1-2 mm from the bonding material
25. The curing light/shield characteristics include which of the following?
    1. Shield is surface disinfected after use
    2. Used to harden or cure dental materials
    3. Hardened material can remain on the tip with no adverse effects
    4. Hardened material must be removed from tip regularly
    5. During use the curing light should be protected with a plastic barrier
        a. 1, 2 and 4
        b. 1, 2, 4 and 5
        c. 1, 2, 3 and 4
26. Universal precautions must be used in all patient care, including the bonding of brackets. Under universal precautions, saliva of all patients is considered potentially infectious for:
    1. HIV
    2. HBV
    3. Other blood-borne pathogens
        a. 1 only
        b. 1 and 2
        c. 1, 2 and 3
        d. None of the above
27. One guideline for the use of protective masks include that they should be changed every third patient. Additionally, the mask should contact the mouth when worn.
    a. Both statements are false
    b. Both statements are true
    c. The first statement is true the second is false
    d. The first statement is false and the second is true
28. Face shields provide adequate eye protection. They also provide enough protection so that a mask need not be worn.
    a. The first statement is true the second is false
    b. The first statement is false and the second is true
    c. Both statements are false
    d. Both statements are true
29. When bonding material is placed it should be:
    1. Handled carefully and prepared according to manufacturer's directions
    2. Material is evenly applied without air bubbles/voids
    3. Polymerization time is carefully monitored
    4. Confined to the entire facial/buccal surface of the tooth
        a. 1, 2 and 4
        b. 1, 2 and 3
        c. 1, 2, 3 and 4
        d. 1, 3 and 4
        e. 2, 3 and 4
30. What type of gloves should be worn when opening drawers during dental procedures?
    a. Sterile gloves
    b. Utility gloves
    c. Over-gloves
    d. Powder-free latex gloves
31. An example of PPE is:
    a. Dental dam
    b. Gloves
    c. Suction tip
    d. Patient bib

32. When bonding brackets to porcelain the surface is prepared in the following way:
    1. Removal of glaze
    2. Pumice surface
    3. Use of 10% Hydrofluoric acid
    4. Micro-etch
    5. Porcelain primer
        a. 1, 2, 3 and 5
        b. 1, 2 and 3
        c. 1, 3 and 4
        d. 1, 3 and 5
33. Self-etching primers are designed to streamline the bonding steps. Self-etching primers combine the etching and bonding materials in a single solution.
    a. The first statement is true the second is false
    b. The first statement is false and the second is true.
    c. Both statements are false
    d. Both statements are true
34. Contaminated waste is waste that has been in contact with blood or other body fluids:
    a. Appropriate PPE should be worn while handling
    b. Includes used barriers and patient napkins
    c. a and b
35. When should utility gloves be worn?
    a. While taking out the trash
    b. While disinfecting the treatment area
    c. While preparing instruments for sterilization
    d. b and c
36. Gold crowns require special preparation to bond brackets to them. First the surface must be prepared by the orthodontic assistant with a carbide or diamond bur or micro-etcher.
    a. The first statement is true the second is false
    b. The first statement is false and the second is true
    c. Both statements are false
    d. Both statements are true
37. The appropriate steps in order for gold crown preparation include:
    a. Pumice, bur prep, metal primer, bonding paste
    b. Micro-etch or bur prep, metal primer, bonding agent, bonding paste
    c. Micro-etch or bur prep, bonding paste
38. Hyper-mineralized teeth have an excessive layer on the enamel due to:
    1. Tooth is located near the salivary gland ducts
    2. Etching time remains the same
    3. Using hydrofluoric acid etching time must be increased
    4. Using phosphoric acid etching time should be at least 60 seconds
        a. 1 and 4
        b. 1 and 2
        c. 1 and 3
39. For patient protection during the etching process the location of the etchant should be monitored at all times. If the etchant comes in contact with oral soft tissue it can cause injury.
    a. The first statement is false and the second is true
    b. Both statements are false
    c. Both statements are true
    d. The first statement is true and the second is false
40. If the etchant comes in contact with the oral soft tissue the tissue should be rinsed for:
    a. 1-2 minutes
    b. 5 minutes
    c. 10 minutes
    d. 15 minutes
41. Additional measures for the patient's protection includes the use of safety glasses to avoid eye exposure.
    a. True
    b. False
    c. The patient doesn't need to wear glasses but should know where the eye wash station is located and know how to operate it.

42. Isolation should include all of the following except:
    1. Protection of soft and hard tissues
    2. Prevention of moisture contamination
    3. Cotton rolls should be effective for all patients in the retraction of cheeks and lips
    4. Select the cotton roll lengths that will best fit and remain in the vestibule
    5. Dry angles/dri-aids can assist with moisture control from Wharton's ducts
        a. 5, 3 and 2
        b. 5 and 3
        c. 5, 4, 3 and 2
        d. 5, 3 and 1
43. Cheek retractors are available to aid in retraction of the cheeks and lips. Tongue guards and saliva ejectors also provide additional moisture control.
    a. The first statement is true the second is false
    b. The first statement is false and the second is true
    c. Both statements are false
    d. Both statements are true
44. Occasionally despite following procedures an etched and dried enamel surface may become contaminated by saliva prior to placement of the bonding agent. If this occurs the next step would be:
    a. Bond and continue with procedure
    b. Etch the surface again; etching for 30 seconds
    c. Contamination must be corrected, etch for 10-15 seconds
    d. Clean the enamel surface with pumice, etch for 15 seconds and continue with procedure
45. OSHA is the federal regulatory agency that ensures the safety and health of America's workers.
    a. True
    b. False
46. Hazardous chemical is defined as any chemical that can cause a physical or a health hazard.
    a. True
    b. False
47. Primary enamel structure is organized, as is the enamel of the permanent adult tooth. The primary enamel requires the same amount of time for etching to provide adequate bond strength.
    a. The first statement is true the second is false
    b. The first statement is false and the second is true
    c. Both statements are false
    d. Both statements are true
48. At the end of the rinse cycle (after etching) before air-drying the teeth and the oral cavity should be inspected for residual etchant material. Removing the etchant at this time can eliminate prolonged contact and subsequent chemical irritation.
    a. Both statements are false
    b. Both statements are true
    c. The first statement is true the second is false
    d. The first statement is false and the second is true
49. The following is/are true regarding hand washing:
    1. Hands are washed prior to glove placement
    2. Hands are washed immediately after glove removal
    3. Liquid soap should be used
    4. Bar soap may be used
    5. Hands should be completely dry before placement of gloves.
        a. 1, 2, 3, 4 and 5
        b. 1, 2 and 5
        c. 1, 2, 3 and 5
        d. 1, 2, 4 and 5
50. Etchant material has potential health effects to the skin, upon ingestion or inhalation. Repeated contact to the skin may lead to burns and rashes.
    a. Both statements are false
    b. Both statements are true
    c. The first statement is true the second is false
    d. The first statement is false and the second is true

Written Examination Answer Key

1. d
2. a
3. a
4. a
5. a
6. b
7. a
8. b
9. b
10. c
11. b
12. a
13. d
14. b
15. d
16. c
17. d
18. d
19. c
20. e
21. b
22. b
23. c
24. d
25 b
26. c
27. a
28. a
29. b
30. c
31 b
32. d
33. d
34. c
35 d
36. a
37. b
38. a
39. c
40. d
41. a
42. b
43. d
44. c
45. a
46. a
47. d
48. b
49. c
50. b

Module 5

Bracket Placement & Removal

By: Greg Nachaljian

PERFORMANCE OBJECTIVES

After completing the following areas of didactic, laboratory and clinical instruction in preparing teeth for bonding, the student will be able to:

1. Understand the concepts of bracket design
2. Describe the key concepts of bracket placement on teeth
3. Know the different materials used for bonding brackets to teeth
4. Describe the steps for placing and curing brackets on teeth
5. Describe the proper technique for placing bonding material on a bracket base
6. Describe the armamentarium and steps involved in bracket placement
7. Describe direct bonding and indirect bonding and their differences
8. Know the instrumentation and steps in removing brackets from teeth

On typodont teeth and patients, the student will be able to:

1. Assemble appropriate armamentaria for bracket placement, curing and removal
2. Confirm the type of bracket to be used
3. Verify teeth that will receive brackets
4. Prevent contamination of the bracket base by not touching it with hands or gloves
5. Identify the properly positioned bracket
6. Orient the bracket to four different dimensions: vertical, horizontal, tip, and torque
7. Choose bonding material
8. Follow application techniques and curing times
9. Place and cure brackets by quadrant
10. Evaluate product using ideal criteria with 75% accuracy
11. Provide appropriate patient education
12. Maintain appropriate infection control throughout all procedures

Outline

DIDACTIC SESSION

4 Hours

1. Bracket Design and Bracket-Archwire Interaction
2. Bracket Placement Criteria
3. Bonding Material Characteristics, Application Techniques and Curing Time Factors
4. Armamentaria for Bracket Placement
5. Procedures for Direct Bracket Bonding with Different Materials
6. Rationale for Indirect Bracket Bonding
7. Armamentaria for Indirect Bracket Placement
8. Procedure for Indirect Bracket Bonding
9. Bracket Removal Considerations
10. Armamentaria for Bracket Removal
11. Procedures for Bracket or Tube Removal

LABORATORY SESSION 1

2 Hours

During this session, students will practice the selection, preparation of brackets, etching, prepositioning, final positioning by orthodontist and bracket removal on typodont teeth. Students will work with a partner during the process of these procedures; the assisting student will observe each state of the process for evaluation. Students will load brackets and position on a minimum of four anterior and four posterior typodont teeth, with one of each of the four times used for a practical exam.

LABORATORY SESSION 2

2 Hours

Laboratory practice on typodont teeth continues, but now for specialized techniques for direct and indirect bonding with review of considerations for products used for bonding atypical enamel, porcelain, plastic, gold etc. and practice protocol for contaminated teeth. Students working in pairs will select, etch and place orthodontic brackets followed by inspection by the orthodontist and then bracket removal. Students will practice applications on a minimum of four typodont teeth for each assigned tooth material to include enamel, porcelain, and plastic tooth materials with one serving as a practical examination.

WRITTEN FINAL EXAMINATION

1 Hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

CLINICAL INSTRUCTION

4 Hours

During this session, the instructor will demonstrate the sequence of tooth preparation for bonding on active patients. Student experience on active patients will include bracket bonding on four anterior and four posterior teeth a minimum of four times each, with one of each of the four times used for a practical exam and removal of brackets on four anterior and four posterior teeth a minimum of four times each, with one of each of the four times used for a practical exam.

Laboratory and Clinical Instruction

LABORATORY SESSION 1

2 Hours

During this session, students will practice selection, preparation of brackets, etching, prepositioning, final positioning by orthodontist, and bracket removal on typodont teeth.

Laboratory Instructions

Students will work with a partner during the process of these procedures. The assisting student will observe each stage of the process for evaluation. The following is a step-by-step description of the procedures that should be followed during the laboratory practice sessions:

1. Each student will set up his/her armamentaria for bonding and bracket placement.
2. Student will be provided with a typodont, a bench mount and four anterior and four posterior typodont teeth. In addition, the student will be provided with individualized packets that will include:
    a. Description of packet
    b. Bracket cements
    c. Bracket bonding instruments and supplies
3. Instructor will review procedures and present information on how to use the lab worksheet for selecting, etching, bracket positioning, bond curing and bracket removal.
4. Instructor will present criteria for ideal bracket cement loading, application techniques, and removal of orthodontic brackets. Instructor will demonstrate application techniques and provide ideal examples that will be passed around for viewing.
5. Student will load brackets and position on a minimum of four anterior and four posterior typodont teeth according to the following procedure:
    a. Select orthodontic brackets for each typodont tooth
    b. Perform coronal polish
    c. Isolate one quadrant
    d. Etch and prepare teeth for orthodontic bonding
    e. Load orthodontic brackets with bonding cement
    f. Preposition brackets on typodont teeth
    g. Orthodontist to check final positions of brackets
    h. Cure orthodontic brackets
    i. Evaluate product using ideal criteria
6. Perform bracket removal
    a. Set up appropriate armamentaria for debonding procedure
    b. Using appropriate technique, remove brackets from teeth starting with the posterior brackets and moving forward.
    c. Using composite removing plier, remove adhesive from the teeth
    d. Prophy and finish.
    e. Evaluate product using ideal criteria
7. One of each of the four times is used for a practical exam; partner observes, evaluates and records on worksheet. Student will also evaluate him/herself on the procedure. Instructor evaluates the bracket bonding techniques. The entire process will continue to be evaluated on the worksheet by the student, partner/assistant and instructor.
8. Partners switch places, the operator becomes the assistant, and the assistant becomes the operator. Both students complete eight typodont teeth.
9. Instructor will now present product evaluation form and how it is used to evaluate final application of bonding materials, bracket placement techniques and the bonding process.
10. Using the product evaluation form, the student operator and the student assistant and instructor grade the application of bonding materials, bracket placement techniques and the bonding process for each other.
11. Discussion on product evaluation is conducted in small groups.

LABORATORY SESSION 2

2 Hours

During this session, students will practice selection, preparation of brackets, etching, prepositioning, final positioning by orthodontist, and bracket removal on typodont teeth.

Laboratory Instructions

Laboratory practice on typodont teeth continues but now for specialized techniques for direct and indirect bonding with review of considerations for products used for bonding atypical enamel, porcelain, plastic, gold etc. and practice protocol for contaminated teeth. Working with a partner, each student functions as an operator and selects, etches, and places orthodontic brackets followed by inspection by the orthodontist and then bracket removal. Student will then function as an assistant and observe and evaluate placement with partner.

WRITTEN EXAMINATION

1 Hour

CLINICAL SESSION – MODULE 4 AND 5

4 Hours

During this session, the instructor will demonstrate the sequence of tooth preparation for bonding on active patients (module 4) and the sequence of bracket positioning, bond curing and bracket removal on select patients (module 5).

The following procedures will be demonstrated:

FROM MODULE 4

1. Perform coronal polish
2. Isolate one quadrant and dry
3. Perform etchant application procedures
4. Suction etchant from tooth
5. Rinse and dry etched tooth/teeth
6. Apply primer/bonding material(s)
7. Cure material
8. Apply composite resin material
9. Cure composite resin material

FROM MODULE 5

10. Select brackets for specified teeth for bracket bonding
11. Load brackets with bonding cements
12. Preposition brackets on teeth
13. Cure brackets once position is verified by orthodontist
14. Remove brackets on selected patients

Student experience on active patients will include preparation for subsequent bracket bonding, bracket bonding and removal of brackets on four anterior and four posterior teeth a minimum of four times each, with one of each of the four times used for a practical exam.

The following general procedures will occur for each patient:

1. Operatory will be set up following the infection control guidelines.
2. Medical history will be completed by the patient prior to seating.
3. Equipment and supplies will be checked by student/operator.
4. The patient will be seated and prepared for treatment.
5. Student operator will review medical history and perform a patient assessment; instructor will follow-up with same procedures.
6. Patient is given instructions/explanation of procedures.
7. Student operator will perform the following according to the stated criteria: Somehow denote that a-j are from module 4 and k-o are from module 5
    a. Perform coronal polish
    b. Isolate one quadrant and dry
    c. Perform etchant application procedures
    d. Suction etchant from tooth.
    e. Rinse and dry etched tooth/teeth
    f. Apply primer/bonding material(s)
    g. Cure material
    h. Apply composite resin material
    i. Cure composite resin material
    j. Evaluate product using ideal criteria
    k. Select brackets for specified teeth for bracket bonding
    l. Load brackets with bonding cements
    m. Preposition brackets on teeth
    n. Cure brackets once position is verified by orthodontist
    o. Remove brackets on selected patients
    p. Give patient post-op instructions
    q. Dismiss patient
    r. Perform operatory clean-up according to infection control guidelines

After the student operator completes the sequence of procedures, the student operator, the assistant and the instructor will evaluate the performance of the student operator using the worksheet and product evaluation.

During this time period the following procedures will occur:

1. The student/operator will evaluate his/her own work according to stated criteria using the worksheet and product evaluation forms.
2. The student/assistant will assist, observe and evaluate operator's performance according to criteria using the worksheet and product evaluation forms.
3. The instructor will evaluate both students' work/performance using stated criteria using the worksheet and product evaluation forms. Discussion on results will be conducted.

Worksheets

Students will complete study material for Module 4 (preparing teeth for bonding) and Module 5 (bracket placement) prior to proceeding with the laboratory section which will include instruction in the continuum of both procedures. See Module 4 for forms used with laboratory instruction for both modules.

Course Requirements

The following is an overview of the course requirements and the protocol followed for laboratory and clinical practice, the written and clinical examination.

Minimum Number of Satisfactory Performances

All students will perform at a minimum the following procedures in order to achieve minimum competence in the various protocols used in the preparation of teeth for bonding brackets:

On a typodont and patients, the student will perform the following under OSHA and DBC guidelines:

- On the typodont: Apply etchant and other appropriate materials preposition brackets, cure, and remove brackets on four anterior and four posterior typodont teeth a minimum of four times, with one of each of the four times used for a practical exam according to the specified criteria.
- On the patient: Apply etchant and other appropriate materials preposition brackets, cure, and remove brackets on four anterior and four posterior teeth a minimum of four times each on at least two patients according to the specified criteria with one of each of the four times used for a practical examination with 75% accuracy.

Students are required to meet the specified minimal number of satisfactory performances as indicated above. The student operator grades his/her own performance, the student assistant grades the performance of the student operator and the instructor will assess the student operator's performance and the grading method of both students.

When the student reaches the 75% minimum performance for bracket placement and removal and 100% performance on all infection control protocol, the instructor evaluates the procedure for the minimal number of satisfactory performances. If a student does not fulfill the minimum grade for the number of satisfactory performances additional laboratory and/or clinical practice procedures will be assigned.

Objective Evaluation Criteria

Objective evaluation criteria shall be provided to each student prior the performance of any procedure. The student will receive information provided by the instructor prior to performing any laboratory or clinical procedures. The instructor shall supply the student with general program, individualized cognitive and psychomotor objectives and criteria for evaluation. Objective criteria will be utilized in the performance of all laboratory and clinical requirements.

Preparing and Prepositioning Brackets

1. Will review the medical/dental history, make a general assessment, and oral inspection on each patient prior to treatment, checking for information that may contraindicate the performance of the procedure; Criteria for choosing specific materials for preparing surface for bonding brackets:
    a. Indications:
        i. Enamel
        ii. Gold
        iii. Porcelain
        iv. Amalgam
        v. Plastic/composite
    b. Contraindications:
        i. Tooth surface with caries
2. Will set up the required armamentaria for coronal polish, etchant and other bonding materials for subsequent bracket bonding
3. Will use aseptic techniques according to OSHA and DBC throughout performance on all patients.
4. Will place protective barriers, seat and position the patient
5. Will evaluate the teeth scheduled to for brackets
6. Will explain to patient the treatment planned for that day
7. Will perform coronal polish on the teeth, ensuring a completely cleaned surface
8. Will isolate, thoroughly clean and dry teeth, four anteriors and four posteriors prior to application of etchant and bonding agents for subsequent bonding brackets
9. Will select brackets specific to teeth treatment planned for bracket bonding
10. Will load bracket base with bonding cement in preparation for placement of brackets

Bracket Loading Criteria

1. Will apply bonding cement to mesh of brackets according to the manufacturer's directions covering the target area of the bracket, thoroughly working material into mesh, while avoiding excess amounts beyond areas of the bracket base
2. Will load bracket onto a bracket holder in preparation for placement on tooth

Prepositioning Brackets on Teeth (with final position determined by orthodontist) Criteria

1. Brackets will be placed by student on tooth in ideal vertical and horizontal position
2. Orthodontist will finalize bracket position and remove excess cement
3. Student will hold the curing light as close as possible without touching the bracket and will cure bracket form both mesial, distal, and occlusal for at least 20 seconds for a full cure
4. Care will be taken to avoid contact with bracket and possible alteration of final bracket position prior to curing
5. Student will vary curing times based on manufacturers recommendations for curing units and bonding cements to achieve complete polymerization
6. The isolation material will be removed.
7. If excess material is present, it will be removed with a hand instrument or an ultrasonic scaler.
8. Will evaluate bracket placement, cement integrity, and identify problem-solving methods to improve or modify procedures

Bracket Removal Criteria

1. Will prepare patient for bracket removal with instructions on what patient may experience during procedure
2. Will remove brackets with bracket removing pliers
3. Will support tooth to minimize patient discomfort while applying pliers pressure and occlusal rotation to remove bracket.

General Criteria

1. Will provide pertinent and individualized patient education
2. Will provide follow up appointment to evaluate bracket retention
3. Will meet ethical and legal requirements for this procedure
4. Will provide accurate chart entries for this procedure
5. Will utilize OSHA and DBC guidelines for instrument processing, removing waste and cleaning/disinfecting treatment area

The above criteria will be used to evaluate and assess appropriate use of materials with subsequent bracket placement with a minimum of 75% accuracy for laboratory and clinical patients.

General Clinical Practice Protocol

Students will have their first clinical practice by preparing four anterior and four posterior teeth a minimum of four times each, with one of each of the four times used for a clinical exam. They will also complete procedures on two clinical patients. The following general procedures will occur:

Patient Selection Criteria

The following criteria must apply for each patient:

1. Patient must be an active orthodontic patient
2. Patient must be in good health (medical history form will be completed prior to treatment, reviewed and approved by the instructor)
3. Each patient will have a minimum of four anteriors and four posteriors per arch for tooth preparation with subsequent bonding of brackets
4. Criteria for selected patients will apply for removal of brackets as these will likely be different patients considering the process of bracket bonding and r emoval in orthodontic treatment practices

The student will function as an operator, an assistant and a patient. Working as partners (operator and assistant) an operator will perform the procedure, the assistant will observe, and evaluate each step of the procedure. When complete each student will do the procedure, observe and evaluate.

The following general procedures will occur for each of the patients:

1. Operatory will be set up following the infection control guidelines
2. Medical history will be completed by the patient prior to seating
3. Equipment and supplies will be checked by the student
4. Patient will be seated and prepared for treatment
5. Student operator will review the medical history and perform a visual exam
6. The instructor will review the medical history and perform a visual exam
7. Instructor will accept the patient for preparation of teeth for subsequent bonding
8. Student operator will perform the following according to the stated criteria:

a. Perform coronal polish

b. Isolate and dry

c. Perform etchant application and procedure

d. Rinse and dry etched tooth/teeth

e. Employ additional bonding materials for specific needs

f. Cure bonding resin for subsequent bracket placement

g. Load and preposition brackets with final position determined by the orthodontist

h. Evaluate the product

i. Provide individualized patient education

j. Dismiss the patient

k. Make appropriate chart notes

l. Perform operatory clean-up/instrument processing according to infection control guidelines

After etchant and bonding for subsequent bracket bonding and removal procedures, the student operator, student assistant and the instructor complete evaluation using the worksheet and product evaluation form.

During this time period, the following will occur:

1. Student operator will evaluate his/her own work according to stated criteria using worksheet and product evaluation forms.
2. Student assistant will assist, observe, evaluate operator's performance according to stated criteria using the worksheet and product evaluation forms.
3. The instructor will evaluate both students' work according to stated criteria using the worksheet and product evaluation forms. Results will be discussed.

A 75% must be obtained for passage of preparing teeth/ bonding brackets on a practice patient and a minimum of two clinical patients.

General Examination Protocol

Written Examination

A comprehensive written examination of 20 questions on the entire curriculum will be administered. The student must receive a minimum score of 75% on the examination to pass the class. One hour has been reserved for the written examination.

Clinical Final Examination

The clinical final examination occurs during the process of working on the two active orthodontic patients during the preparation of teeth for subsequent bonding, bracket placement and removal following patient selection criteria and procedures outlined in the module's clinical practice protocol.

Written Examination

1. Brackets can be manufactured using composites, titanium, and stainless steel.
    a. True
    b. False
2. Bracket cements are composed of:
    a. Resin binding agents
    b. Water
    c. Inorganic fillers
    d. Tar
    e. a and b
    f. b and c
    g. a and c
    h. All of the above
3. Bracket cements polymerization is initiated with:
    a. A catalyst and accelerators
    b. Photons of light
    c. Heat
    d. Cold
    e. a and b
    f. b and c
    g. a, b and c
    h. a, b, c, and d
4. Light curing composites require the use of a curing unit that uses heat to polymerize the bonding cement.
    a. True
    b. False
5. Self-cured composites cure by initiation of a chemical reaction. This reaction hardens the material in minutes with up to 90% of the strength in the first 2 minutes.
    a. Both statements are false
    b. The first statement is true and the second statement is false
    c. The first statement is false the second statement is true
    d. Both statements are true
6. Brackets consist of the following components:
    a. Bracket base
    b. Retention mesh
    c. Band
    d. Bracket Slot
    e. Tie wings
    f. a, b and c
    g. b, c and d
    h. a, b, d and e
7. The bracket slot is where the archwire is placed.
    a. True
    b. False
8. Bonding cements can be placed on a mixing pad and left uncovered as these materials are only sensitive to high intensity lights.
    a. True
    b. False
9. Indirect bracket bonding is a technique used by al orthodontists. This method requires more time to place brackets then direct bonding.
    a. Both statements are false
    b. The first statement is true and the second statement is false
    c. The first statement is false the second statement is true
    d. Both statements are true
10. Indirect bonding has the following advantages:
    a. Reduced chairside time for the doctor
    b. Less laboratory time
    c. Shortened appointment for patient for initial bonding
    d. Potentially more accurate bracket positioning
    e. a, b and c
    f. a, c and d
    g. a, b, c and d

11. Indirect bonding has some disadvantages:
    a. More laboratory time with multiple steps to prepare bonding trays
    b. More chairside time for the doctor
    c. Distortions in the model may introduce bracket bonding failures
    d. a and b
    e. a and c
    f. a, b and c
12. Brackets are designed with a mesh material on the base. This material provides chemical retention of the bracket cement to the bracket.
    a. Both statements are false.
    b. The first statement is true and the second statement is false
    c. The first statement is false the second statement is true
    d. Both statements are true
13. The dental practice act allows dental assistants to utilize high speed burs and hand pieces to remove bracket cement.
    a. True
    b. False
14. The following instruments are routinely used for removal of orthodontic brackets:
    a. Pin cutters
    b. Bracket removing pliers
    c. Distal end cutters
    d. Band removing pliers
    e. a and b
    f. a and c
    g. c and d
15. When removing a full set of brackets, the archwires are always removed first.
    a. True
    b. False
16. Light cured bracket cements require 5 seconds for a full cure when using a conventional halogen curing light.
    a. True
    b. False
17. Ceramic brackets typically require longer curing times.
    a. True
    b. False
18. Brackets placement on the tooth is not critical as the wires are usually bent to place the tooth in the correct positions.
    a. True
    b. False
19. Self-ligating brackets were designed with a door or other mechanism to hold the archwire. Though these mechanisms are convenient for the assistant to close the components are susceptible to plaque buildup when compared to ligated brackets.
    a. Both statements are false
    b. The first statement is true and the second statement is false
    c. The first statement is false the second statement is true
    d. Both statements are true
20. Brackets provide the force in orthodontics that moves the teeth.
    a. True
    b. False

Written Examination Answer Key

1. a
2. g
3. g
4. b
5. d
6. h
7. a
8. b
9. a
10. f
11. e
12. b
13. b
14. e
15. b
16. b
17. b
18. b
19. b
20. b

Module 6

Archwire Placement & Ligation

By: Greg Adams

PERFORMANCE OBJECTIVES

After completing the following areas of didactic, laboratory and clinical instruction in the placement of archwires and ligation, the student will be able to:

1. Describe the key concepts of archwire placement and ligation
2. Describe the different alloy types, shapes, sizes and increasing levels, forces used with archwire progression
3. Describe the different ligation systems
4. Describe the proper techniques for archwire placement and ligation
5. Describe the armamentarium and steps involved in archwire placement and ligation

On typodont teeth and patients, the student will be able to:

1. Assemble appropriate armamentaria for archwire placement and ligation
2. Identify and mark the midline of the archwire
3. Estimate the length of the wire prior to placement in mouth
4. Allow wire to rest buccal to the terminal bracket in the arch
5. Use distal end cutter to remove gross excess
6. Place the archwire using utility plier in the first molar tube or second if applicable
7. Confirm midline-ligate the wire to the brackets beginning from the tooth mesial to the first molar
8. Work around the arch until all teeth are secured
9. Cut excess wire length
10. Check archwire ensuring it is not too long or too short
11. Evaluate product using ideal criteria with 75% accuracy
12. Provide appropriate patient education
13. Maintain appropriate infection control throughout all procedures

Outline

DIDACTIC SESSION

2 Hours

1. Archwire Characteristics
    a. Alloy types
    b. Shapes
    c. Dimensions
    d. Forces
2. Armamentaria
3. Procedures for Placement
4. Ligature Systems

LABORATORY SESSION 1

4 Hours

During this session, students will practice the insertion of a preformed maxillary and mandibular archwire and ligation using elastic or metal ligatures or self-ligating brackets on typodont teeth. Students will work with a partner during the process of these procedures; the assisting student will observe each state of the process for evaluation. Students will practice each skill a minimum of four times per arch with one of each of the four times used for a practical exam.

LABORATORY SESSION 2

2 Hours

During this session, students continue to practice the insertion of a preformed maxillary and mandibular archwire and ligation using elastic or metal ligatures or self-ligating brackets on typodont teeth. Students will work with a partner during the process of these procedures; the assisting student will observe each state of the process for evaluation. Students will practice each skill a minimum of four times per arch with one of each of the four times used for a practical exam.

WRITTEN FINAL EXAMINATION

1 Hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

CLINICAL INSTRUCTION

8 Hours

During this session, the student will practice inserting a preformed maxillary and mandibular archwire and ligating archwires using a combination of elastic and metal ligatures or self-ligating brackets on at least two active patients, with one patient's maxillary and mandibular archwire placement used as a clinical examination.

Laboratory and Clinical Instruction

LABORATORY SESSION 1 & 2

6 Hours

During lab sessions, students will practice archwire placement and ligation on typodont teeth.

Laboratory Instructions

Students will work with a partner during the process of these procedures. The assisting student will observe each stage of the process for evaluation. The following is a step-by-step description of the procedures that should be followed during the laboratory practice sessions:

1. Each student will set up his/her armamentaria for archwire placement and ligation on a typodont.
2. Student will be provided with a typodont and a bench mount. In addition, the student will be provided with individualized packets that will include:
    a. Description of packet
    b. Assortment of archwires and ligating materials
    c. All armamentarium for archwire placement and ligation
3. Instructor will review procedures and present information on how to use the lab worksheet for archwire placement and ligation.
4. Instructor will present criteria for ideal archwire placement and ligation. Instructor will demonstrate techniques and provide ideal examples that will be passed around for viewing.
5. Student will place maxillary and mandibular archwires and ligate on a typodont a minimum of four times.
6. One of each of the four times is used for a practical exam; partner observes, evaluates and records on worksheet. Student will also evaluate him/herself on the procedure. Instructor evaluates the archwire placement and ligation. The entire process will continue to be evaluated on the worksheet by the student, partner/assistant and instructor.
7. Partners switch places, the operator becomes the assistant, and the assistant becomes the operator. Both students complete three archwire placements and ligation.
8. Instructor will now present product evaluation form and how it is used to evaluate final archwire placement and ligation.
9. Using the product evaluation form, the student operator and the student assistant and instructor grade the final archwire placement and ligation.
10. Discussion on product evaluation is conducted in small groups.

WRITTEN FINAL EXAMINATION

1 hour

CLINICAL INSTRUCTION

8 hours

During this session, the student will practice inserting a preformed maxillary and mandibular archwire and ligating archwires using a combination of elastic and metal ligatures or self-ligating brackets on at least two active patients. Student operator will perform the following according to the stated criteria:

1. Each student will set up his/her armamentaria for archwire placement and ligation.
2. Student will be provided with two patients.
3. Instructor will review procedures for archwire placement and ligation.
4. Student will place archwires and ligate on the patients while partner observes, evaluates and records on worksheet.
5. Student will also evaluate him/herself on the procedure.
6. Instructor evaluates the archwire placement and ligation. The entire process will continue to be evaluated on the worksheet by the student, partner/assistant and instructor.
7. Students will complete a minimum of four times with one of the four times used for a clinical examination.
8. Partners switch places, the operator becomes the assistant, and the assistant becomes the operator, both student partners have completed at this placement of four archwires with ligation.
9. The worksheets are then evaluated by the students and instructor.

Worksheets

LABORATORY & CLINICAL PATIENT WORKSHEETS

General Information on Worksheets

The student operator, student assistant and instructor use these forms. Each of these individuals will watch the performance of the specified steps of the given procedure and then identify if any of these steps are not followed and/or inadequately performed by the student operator. During the learning process, errors can and will occur. Students and clinical instructors identify common errors encountered during each step of the entire procedure utilizing the worksheets. Worksheets are not grade sheets, but they assist the student to identify his or her own errors during performance of these steps. They are used for measuring student's progress toward attainment of clinical proficiency.

General Procedures

An important part of the learning experience in the process of archwire placement and ligation is the ability to identify technique errors, understand their causes and find solutions. Equally important is to determine the degree of error and when it constitutes a need to redo the procedure. The first step in this process is to identify the error(s). Using the Archwire Placement and Ligation Laboratory and Clinical Patient Worksheets does this. The worksheets are not grade sheets but are documents that are used to assist students in learning to identify common technique errors related to the procedures associated with archwire placement and ligation. The student uses this form in the following manner:

The worksheet consists of a column titled Procedure-Laboratory and Procedure-Clinical, which is the step-by-step description of the procedures associated with archwire placement and ligation. The procedures are subdivided into the following categories:

- Infection Control/Patient Safety
- Assemble Armamentaria
- Fitting
- Trimming
- Ligating
- Patient Education
- Infection Control/Patient Safety/Clean-up

How Worksheets Are Used by Student Operator and Student Assistant

1. When performing multiple procedures either in the laboratory or on clinical patients, all of the errors from these series are placed on one worksheet.
2. Each laboratory/clinical experience is graded in a different column.
3. When an error occurs in any of the individual steps described in the Procedure column, a check is placed in the box corresponding to the laboratory/clinical experience.

For example, on the clinical patient worksheet there would be a box for each step of the clinical practice patients. For the laboratory worksheet, there would be a box for the typodont teeth. With worksheet check-offs, the student can identify a clustering pattern of errors in any particular step. When an instructor evaluates the student's performance, he/she cannot only see how a student performs, but whether or not the student can identify errors that he/she makes.

How the Student Identifies Cause and the Correction of Errors

After the student identifies the error(s) performed, he/she will write the cause of the error and how it shall be rectified. The student then identifies whether the error is significant enough to require re-fitting archwire and/or re-ligating. During this process, the student will review the criteria for successful archwire placement and ligation.

How the Instructor Uses the Worksheets

The instructor watches the student operator during the entire process of archwire placement and ligation. The instructor will check the appropriate box on the same worksheet used by the student operator and the student assistant. The instructor observes both students, and then evaluates the grading completed by both students for accuracy. The instructor reviews the worksheets for information related to cause, solution and whether any part of the procedure requires additional steps. The instructor can provide additional assistance where needed. This process of identification of errors, causes and solutions will ensure the student will progress towards clinical competence and expected course objectives will be met. This process will continue throughout all laboratory and clinical requirements. When the clinical final exam is administered the student should be clinically competent in archwire placement and ligation.

Satisfactory Performances of Psychomotor Skills

Students will practice psychomotor skills during the laboratory and preclinical sessions until they reach a competence level of 75% utilizing the documented criteria evaluated using the behaviorally anchored rating scale. Students must achieve a passing score on a minimum of two typodont teeth or natural teeth before progressing on to successive laboratory, preclinical and clinical sessions.

Worksheet – Laboratory

ARCHWIRE PLACEMENT & LIGATION

Date:

Student/Operator Name:

Student/Assistant Name:

Faculty Name:

Minimum of 4 Maxillary Archwires Placed. Record tooth number(s):

Minimum of 4 Mandibular Archwires Placed. Record tooth number(s):

Use this worksheet to identify errors in procedures. Place a check mark in the box each time a step in the procedure is incorrectly performed or omitted. After each section, the instructor will check before the student continues with the following section.

*** = Critical Error**

Infection Control/Armamentarium	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
Infection Control/Patient Safety			
1. Barriers placed on chair, unit, air-water syringe, HVE, saliva ejector, SP hand piece, curing light			
2. PPE: mask, gloves, scrubs, gown, eye wear, patient safety glasses			
Assemble Armamentaria			
3. Basic set-up: mirror, explorer, cotton pliers Weingart or utility pliers, distal cutters, and Mathieu pliers or hemostats			
4. Air-water syringe, syringe tip, HVE, saliva ejector			
Archwire Placement	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
5. Identifies the midline of the archwire*			
6. Estimates the length of the wire prior to placing in the mouth*			
7. Allows the wire to rest buccal to the terminal bracket in the arch*			

8. Uses the distal end cutter to remove gross excess*			
9. Does not remove too much or too little*			
10. Final length is trimmed with wire placed and ligated in bracket slots*			
11. Uses utility plier to place archwire in the first molar tube*			
12. Slides wire through to the second molar if applicable			
Ligate Archwire			
13. Ligates the wire to brackets*			
14. Begins from the tooth mesial to the first molar*			
15. Works around the arch to the contralateral until all teeth secured*			
16. Severely misaligned tooth ligated first*			
17. Cuts excess wire length*			
18. Looks and feel for wires that extend past the appliance*			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Patient Education	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
19. Give post-operative instructions to the patient or parent			
20. Document procedure in patient chart to include: date, HH review or update, materials used, operator signature, and instructor or DDS signature			
Infection Control/Patient Safety/Clean-Up	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
21. Surface disinfect			
22. Prepare and institute sterilization procedures			
23. Manage PPE: gloves, mask, gown, scrubs, eye wear and patient safety glasses			
24. Unit is checked for completion			

Comments:

STUDENT OPERATOR EXPLANATION OF CHECKMARKS

Procedure #s

Cause(s)

Solution(s)

Re-do? Yes No Tooth #s

Worksheet – Clinical Patient

ARCHWIRE PLACEMENT & LIGATION

Date:

Student/Operator Name:

Student/Assistant Name:

Faculty Name:

Circle one: Patient #1 Patient #2

Patient Name:

Minimum of 2 Maxillary Preformed Archwires Placed. Record tooth number(s):

Minimum of 2 Mandibular Preformed Archwires Placed. Record tooth number(s):

Use this worksheet to identify errors in procedures. Place a check mark in the box each time a step in the procedure is incorrectly performed or omitted. After each section, the instructor will check before the student continues with the following section.

Critical Errors = *

Infection Control/Armamentarium	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
Infection Control/Patient Safety			
1. Barriers placed on chair, unit, air-water syringe, HVE, saliva ejector, SP hand piece, curing light			
2. PPE: mask, gloves, scrubs, gown, eye wear, patient safety glasses			
Assemble Armamentaria			
3. Basic set-up: mirror, explorer, cotton pliers Weingart or utility pliers, distal cutters, and Mathieu pliers or hemostats			
4. Air-water syringe, syringe tip, HVE, saliva ejector			

Archwire Placement	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
5. Identifies the midline of the archwire*			
6. Estimates the length of the wire prior to placing in the mouth*			
7. Allows the wire to rest buccal to the terminal bracket in the arch*			
8. Uses the distal end cutter to remove gross excess*			
9. Does not remove too much or too little*			
10. Final length is trimmed with wire placed and ligated in bracket slots*			
11. Uses utility plier to place archwire in the first molar tube*			
12. Slides wire through to the second molar if applicable			
Ligate Archwire			
13. Ligates the wire to brackets*			
14. Begins from the tooth mesial to the first molar*			
15. Works around the arch to the contralateral until all teeth secured*			
16. Severely misaligned tooth ligated first*			
17. Cuts excess wire length*			
18. Looks and feel for wires that extend past the appliance*			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Patient Education	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
19. Give post-operative instructions to the patient or parent.			
20. Document procedure in patient chart toinclude: date, HH review or update, materials used, operator signature, and instructor or DDS signature.			
Infection Control/Patient Safety/Clean-Up	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
21. Surface disinfect			
22. Prepare and institute sterilization procedures			
23. Manage PPE: gloves, mask, gown, scrubs, eye wear and patient safety glasses			
24. Unit is checked for completion			

Comments:

STUDENT OPERATOR EXPLANATION OF CHECKMARKS

Procedure #s

Cause(s)

Solution(s)

Re-do? Yes No Tooth #s

Product Evaluation Forms

ARCHWIRE PLACEMENT & LIGATION

General Procedures

Product evaluation evaluates the end result of any performance, not the steps. This facility utilizes the behaviorally anchored rating scale (BARS) system. This 10-point system clusters the critical incidents into categories. The instructor can score objectively the end result of sizing, fitting and cementing orthodontic bands by choosing the criteria specified in each point level. Performance is assessed according to established criteria for each of these procedures. The points are then converted to a pass or fail grade.

How Instructor Uses Product Evaluation Form

A product evaluation form will be used for each patient. In the "scores" area on the form you will note that an open box rather than specific grids occurs. This open box allows you to enter a score for each archwire placed.

The student must maintain a minimum point value of 7.5 on all clustered critical incidences per archwire placed. He/she must receive this minimum score for all four archwires placed in order to pass this module. A grade of 7.5 represents a 75% passing score.

Product Evaluation Point Conversion

The student will receive points for a given level of achievement from the point scale utilized for product evaluation.

POINT SYSTEM TO A PASS/ FAIL SCORE

Conversion

Points	Grades
10	➨ Pass-Excellent
7.5	➨ Pass
5	➨ Fail-Critical Error(s)
3	➨ Fail-Critical Errors-no concept

Product Evaluation/Practical Examination – Lab Session 1

ARCHWIRE PLACEMENT & LIGATION

Student Name:

Patient Name: Typodont

Minimum number of satisfactory performances:

1 maxillary preformed archwire placed. Record tooth number(s):

1 mandibular preformed archwire placed. Record tooth number(s):

PLACEMENT OF ARCHWIRE

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Midline of archwire identified B. Estimate length of wire C. Final length is trimmed D. Wire placed first molar tube (or second) E. Cut precisely		

LIGATION

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Ligate wire to brackets B. Work around the arch-begin mesial to first molar C. Works around arch until all brackets are ligated D. Severely misaligned teeth are ligated first E. Look and feel for wires that extend past the appliance		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation/Practical Examination – Lab Session 2

ARCHWIRE PLACEMENT & LIGATION

Student Name:

Patient Name: Typodont

Minimum number of satisfactory performances:

1 maxillary preformed archwire placed. Record tooth number(s):

1 mandibular preformed archwire placed. Record tooth number(s):

PLACEMENT OF ARCHWIRE

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Midline of archwire identified B. Estimate length of wire C. Final length is trimmed D. Wire placed first molar tube (or second) E. Cut precisely		

LIGATION

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Ligate wire to brackets B. Work around the arch-begin mesial to first molar C. Works around arch until all brackets are ligated D. Severely misaligned teeth are ligated first E. Look and feel for wires that extend past the appliance		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation/Practical Examination – Clinical Session

ARCHWIRE PLACEMENT & LIGATION

Student Name:

Patient Name:

Minimum number of satisfactory performances:

1 maxillary preformed archwire placed. Record tooth number(s):

1 mandibular preformed archwire placed. Record tooth number(s):

PLACEMENT OF ARCHWIRE

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Midline of archwire identified B. Estimate length of wire C. Final length is trimmed D. Wire placed first molar tube (or second) E. Cut precisely		

LIGATION

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Ligate wire to brackets B. Work around the arch-begin mesial to first molar C. Works around arch until all brackets are ligated D. Severely misaligned teeth are ligated first E. Look and feel for wires that extend past the appliance		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation Documented Criteria

ARCHWIRE PLACEMENT	
Evaluation Criteria	
Points	**Description**
10 Points	➨ Identifies the midline of the archwire ➨ Estimate the length of the wire prior to placing in the mouth; Allows the wire to rest buccal to the terminal bracket in the arch; Uses the distal end cutter to remove gross excess ➨ Does not remove too much or too little ➨ Final length is trimmed with wire placed and ligated in bracket slots ➨ Uses utility plier to place archwire in the first molar tube ➨ Slides wire through to the second molar if applicable
7.5 Points	➨ Adequately identifies the midline of the archwire ➨ Estimates the length of the wire adequately prior to placement; Allows the wire to adequately rest buccal to the terminal bracket; Uses the distal end cutter adequately to remove gross excess ➨ Adequately removes enough/not too much ➨ Final length is trimmed with wire placed and ligated in bracket slots ➨ Uses utility plier adequately to place archwire in the first molar tube ➨ Slides wire through to the second molar if applicable
5 Points	➨ Does not identify the midline of the archwire ➨ Does not estimate the length of the wire prior to placement; Does not allow the wire to rest buccal to the terminal bracket; Uses the distal end cutter to remove gross excess ➨ Final length is trimmed but too short ➨ Does not use utility pliers to place archwire in the first molar tube
3 Points	➨ Does no identify the midline of the archwire ➨ Does not estimate the length of the wire prior to placement; Does not allow the wire to rest buccal to the terminal bracket; Does not use the distal end cutter to remove gross excess ➨ Final length is not trimmed with wire placed and ligated in bracket slots ➨ Does not use utility plier to place archwire in the first molar tube

Product Evaluation Documented Criteria

LIGATION	
Evaluation Criteria	
Points	**Description**
10 Points	➨ Ligates the wire to the brackets ➨ Begins from the tooth mesial to the first molar ➨ Works around the arch to the contralateral until all teeth secured ➨ Severely misaligned tooth ligated first ➨ Cuts excess wire length ➨ Looks and feel for wires that extend past the appliance
7.5 Points	➨ Adequately ligates the wire to the brackets ➨ Begins from the tooth mesial to the first molar but varies slightly ➨ Works around the arch to the contralateral until all teeth adequately secured ➨ Severely misaligned tooth ligated first ➨ Cuts excess wire length adequately ➨ Looks and feel for wires that extend past the appliance
5 Points	➨ Does not adequately ligate the wire to the brackets ➨ Does not begin from the tooth mesial to the first molar ➨ Works around the arch to the contralateral secures most teeth but does not secure all teeth ➨ Severely misaligned tooth is not ligated first ➨ Excess wire is trimmed too short ➨ Does not look and feel for wires that extend past the appliance
3 Points	➨ Does not adequately ligate the wire to the brackets ➨ Does not begin from the tooth mesial to the first molar ➨ Secures some teeth but does not secure all teeth ➨ Severely misaligned tooth is not ligated ➨ Excess wire is not trimmed ➨ Does not look and feel for wires that extend past the appliance

Course Requirements

The following is an overview of the course requirements and the protocol followed for laboratory and clinical practice, the written and clinical examination.

Minimum Number of Satisfactory Performances

All students will perform at a minimum the following procedures in order to achieve minimum competence in the various protocols used in archwire placement and ligation.

On a typodont and patients, the student will perform the following under OSHA and DBC guidelines:

- On the typodont: placement of a preformed maxillary and mandibular archwire using elastic or metal ligatures or self-ligating brackets a minimum of four times per arch with one of each of the four times used for a practical exam according to the specified criteria.
- On the patient: Insertion of a preformed maxillary and mandibular archwire on at least two patients. Ligating both preformed maxillary and mandibular archwires using a combination of elastic and metal ligatures or self-ligating brackets on at least two patients for each according to the specified criteria with one of each of the four times used for a practical examination with 75% accuracy.

Students are required to meet the specified minimal number of satisfactory performances as indicated above. The student operator grades his/her own performance, the student assistant grades the performance of the student operator and the instructor will assess the student operator's performance and the grading method of both students.

When the student reaches the 75% minimum performance for archwire placement and ligation and 100% performance on all infection control protocol, the instructor evaluates the procedure for the minimal number of satisfactory performances. If a student does not fulfill the minimum grade for the number of satisfactory performances additional laboratory and/or clinical practice procedures will be assigned.

Objective Evaluation Criteria

Objective evaluation criteria shall be provided to each student prior the performance of any procedure. The student will receive information provided by the instructor prior to performing any laboratory or clinical procedures. The instructor shall supply the student with general program, individualized cognitive and psychomotor objectives and criteria for evaluation. Objective criteria will be utilized in the performance of all laboratory and clinical requirements.

Preparation for Archwire Placement and Ligation

1. Will review the medical/dental history, make a general assessment, and oral inspection on each patient prior to treatment, checking for information that may contraindicate the performance of the procedure
2. Will set up the required armamentaria archwire placement and ligation
3. Will use aseptic techniques according to OSHA and DBC throughout performance on all patients
4. Will place protective barriers, seat and position the patient
5. Will evaluate the maxillary and mandibular arches for archwire placement and ligation
6. Will explain to patient the treatment planned for that day
7. Will perform archwire placement and ligation
8. Will place archwires and ligate on at least two patients

Archwire Placement Criteria

1. Will identify the midline of the archwire
2. If a wire will be removed and replaced, will mark the midline with a wax marker for easy replacement
3. Will estimate the length of the wire prior to placement in the mouth
4. Will allow the wire to rest buccal to the terminal bracket in the arch
5. Will use distal end cutter to remove gross excess
6. Will trim the final length with the wire placed and ligated in the bracket slots
7. Will place the archwire using the utility plier place the archwire in the first molar tube, slide through to second molar tube if applicable

Ligation Cr iteria

1. Will confirm the midline and ligate archwire to the brackets
2. Will begin from the tooth mesial to the first molar
3. Will work around the arch to the contralateral or opposite side until all teeth are secured
4. If there is a severely misaligned tooth, will ligate this tooth first
5. Will cut excess wire length
6. Will check (look and feel) for wires that extend past the appliance

General Criteria

1. Will provide pertinent and individualized patient education
2. Will provide follow up appointment as identified in the treatment plan
3. Will meet ethical and legal requirements for this procedure
4. Will provide accurate chart entries for this procedure
5. Will utilize OSHA and DBC guidelines for instrument processing, removing waste and cleaning/disinfecting treatment area

The above criteria will be used to evaluate and assess appropriate archwire placement and ligation with a minimum of 75% accuracy for laboratory and clinical patients.

General Clinical Practice Protocol

Students will complete procedures on two clinical patients. The following general procedures will occur:

Patient Selection Criteria

The following criteria must apply for each patient:

1. Patient must be an active orthodontic patient
2. Patient must be in good health (medical history form will be completed prior to treatment, reviewed and approved by the instructor).
3. Each patient will have a minimum insertion of a preformed maxillary and mandibular archwire and ligation using a combination of elastic and metal ligatures or self-ligating brackets

The student will function as an operator, an assistant and a patient. Working as partners (operator and assistant) an operator will perform the procedure, the assistant will observe, and evaluate each step of the procedure. When complete each student will do the procedure, observe and evaluate.

The following general procedures will occur for each of the patients:

1. Operatory will be set up following the infection control guidelines
2. Medical history will be completed by the patient prior to seating
3. Equipment and supplies will be checked by the student
4. Patient will be seated and prepared for treatment
5. Student operator will review the medical history and perform a visual exam
6. The instructor will review the medical history and perform a visual exam
7. Instructor will accept the patient for archwire placement and ligation
8. Student operator will perform the following according to the stated criteria:
    a. Identify midline of archwire
    b. Estimate the length of the archwire
    c. Use distal end cutter to remove gross excess
    d. Final length will be trimmed after ligation
    e. Place the archwire using the utility plier placing into molar tube
    f. Confirm midline and ligate
    g. Ligate with a combination of elastic, metal or self-ligating brackets
    h. Evaluate the product
    i. Provide individualized patient education
    j. Dismiss the patient
    k. Make appropriate chart notes
    l. Perform operatory clean-up/instrument processing according to infection control guidelines

After archwire placement and ligation procedures, the student operator, student assistant and the instructor complete evaluation using the worksheet and product evaluation form.

DURING THIS TIME PERIOD, THE FOLLOWING WILL OCCUR:

1. Student operator will evaluate his/her own work according to stated criteria using worksheet and product evaluation forms.
2. Student assistant will assist, observe, evaluate operator's performance according to stated criteria using the worksheet and product evaluation forms.
3. The instructor will evaluate both students' work according to stated criteria using the worksheet and product evaluation forms. Results will be discussed.

A 75% must be obtained for passage of archwire placement and ligation.

General Examination Protocol

Written Examination

A comprehensive written examination of 25 questions on the entire curriculum will be administered. The student must receive a minimum score of 75% on the examination to pass the class. One hour has been reserved for the written examination.

Clinical Final Examination

The clinical final examination occurs during the process of working on the two active orthodontic patients during the archwire placement and ligation, with insertion of a preformed maxillary and mandibular archwire ligating both using a combination of elastic and metal ligatures or self-ligating brackets following patient selection criteria and procedures outlined in the module's clinical practice protocol.

Written Examination

1. Orthodontic archwires serve as the main force system and work in concert with orthodontic brackets.
    a. True
    b. False
2. The archwire discussion can be a complex issue because of:
    1. Alloy types
    2. Shapes
    3. Sizes
    4. Forces
        a. 1 and 2
        b. 2 and 3
        c. 1, 3 and 4
        d. 3 and 4
        e. 1, 2, 3 and 4
3. An ideal archwire would have:
    1. High strength
    2. Low strength
    3. Low stiffness
    4. High stiffness
    5. A long range of action
    6. High formability
    7. Low formability
        a. 2, 3, 5 and 7
        b. 1, 4, 5 and 6
        c. 1, 3, 5 and 6
        d. 2, 4, 5 and 7
4. There is no ideal archwire. For this reason, there are different sizes and wire materials that are used for different purposes.
    a. Both statements are false
    b. Both statements are true
    c. The first statement is true the second is false
    d. The first statement is false and the second is true
5. The original archwire was composed of precious metal alloys including gold until the 1960s when stainless was introduced.
    a. True
    b. False
6. Common archwires may be comprised of:
    1. Stainless steel
    2. Cobalt chromium
    3. Nickel titanium
    4. Beta titanium
        a. 1, 2, 3 and 4
        b. 1, 2 and 3
7. Introduction of newer wires has allowed significant clinical changes in orthodontic archwire progression and use. Newer wires are left in the mouth for shorter periods of time for the desired effect.
    a. Both statements are false
    b. Both statements are true
    c. The first statement is true the second is false
    d. The first statement is false and the second is true

Match the following stage of treatment with the type of archwire used during this stage:

8. Initial stages _____
9. Intermediate stages _____
10. Finishing stages _____
    a. Stainless steel, beta titanium or large dimension nickel titanium
    b. Small diameter nickel titanium, multi-strand stainless steel or multi-looped stainless steel
    c. Sectioning the stainless steel or titanium molybdenum alloys and light wires and multi-strand stainless steel

Match the following stages with desired treatment:

11. Initial stages _____
12. Intermediate stages _____
13. Finishing stages _____
    a. Inter-arch corrections while providing stability to the arch form
    b. Leveling and alignment
    c. Settling of occlusion following space closure
14. Archwires may be:
    a. Round
    b. Triangular
    c. Rectangular
    d. Square
    e. All of the above
    f. a, c and d

Match the following:

15. Stainless steel round wire _____
16. Stainless steel square wire _____
17. Stainless steel rectangular wire _____
    a. 0.016 x 0 .022ss
    b. 0.016ss
    c. 0.016 x 0.016ss
18. Armamentarium for placement of the archwire includes:
    1. Mouth mirror
    2. Weingart or utility pliers
    3. Distal end cutters
    4. Mathieu pliers or hemostat
        a. 2, 3 and 4
        b. 1, 2 and 3
        c. 1, 2, 3 and 4
19. Ligation is the process of securing the wire to the orthodontic fixed appliance. There are several systems/methods.
    a. Both statements are false
    b. Both statements are true
    c. The first statement is true the second is false
    d. The first statement is false and the second is true
20. The most common methods of ligation are:
    a. Elastic modules
    b. Steel ligatures
    c. Self-ligating bands
    d. a and b
    e. a, b and c
21. Elastic modules stretch thereby applying less force than wire ties and are less likely to debond brackets. The elastic modules do not attract more plaque and are changed less frequently than steel ligature ties.
    a. Both statements are false
    b. Both statements are true
    c. The first statement is true the second is false
    d. The first statement is false and the second is true
22. The elastic modules come in a variety of colors and appeal to the younger patients. They also deteriorate under intraoral conditions thus shorter periods of continuous force.
    a. Both statements are false
    b. Both statements are true
    c. The first statement is true the second is false
    d. The first statement is false and the second is true
23. Several types of ligature-less, self-ligation, high friction brackets have become available in recent years.
    a. True
    b. False
24. The self-ligating brackets are increasing in popularity.
    a. True
    b. False
25. Self-ligating brackets may offer advantages of:
    a. Saving time
    b. Reducing friction
    c. Increasing friction
    d. Probability of increasing patient comfort
    e. Probability of decreasing patient comfort
    f. a, b and c
    g. a, b and d

Written Examination Answer Key

1. a
2. e
3. c
4. b
5. b
6. a
7. c
8. b
9. a
10. c
11. b
12. a
13. c
14. f
15. b
16. c
17. a
18. c
19. b
20. e
21. c
22. b
23. b
24. a
25. g

Module 7

Ultrasonic Scaling for Cement Removal

PERFORMANCE OBJECTIVES

After completing the following areas of didactic, laboratory and clinical instruction in removal of cement around brackets and bands with an ultrasonic scaler the student will be able to:

1. Explain the concepts of removal of cement around brackets and bands with an ultrasonic scaler
2. Describe the criteria for cement removal around orthodontic bands using the ultrasonic scaler, including indications and contraindications
3. Describe and identify characteristics, manipulation and care of ultrasonic scaler unit when removing excess cement from orthodontically banded teeth
4. Explain the steps for ultrasonic scaling procedure
5. Explain and understand tooth morphology in relationship to the removal of cement with an ultrasonic scaler
6. Describe the armamentaria/equipment/supplies needed for cement removal with an ultrasonic scaler
7. Describe the proper technique of adaptation of ultrasonic tip/insert supra-gingivally upon the tooth's surface
8. Discuss the instrumentation and steps in removal of cement
9. Maintain infection control protocol, to include operator protection, operatory, surface disinfection, or barrier placement and instrument processing, sterilization related to bracket positioning, bond curing and orthodontic bracket removal according to standards defined by OSHA and DBC
10. Identify factors that may cause a health hazard to the operator by viewing a MSDS sheet and know preventive measures that should be employed

On typodont teeth and patients the student will be able to:

1. Assemble appropriate armamentaria for removal of cement around orthodontic bands with an ultrasonic scaler
2. Remove cement around orthodontic band adapting tip/insert without causing damage to soft or hard tissue
3. Provide appropriate patient education
4. Maintain patient comfort by evacuation and or isolation materials
5. Maintain appropriate infection control throughout all procedures
6. Protect herself/himself and the patient from any hazardous situations as defined in the MSDS forms for any cement materials used
7. Evaluate product using ideal criteria with 75% accuracy

Outline

Didactic and laboratory instruction will emphasize developing the student's ability to perform all the proper techniques for removal of excess cement from orthodontically banded teeth with competence. Lecture on manipulation and care of ultrasonic scaler, indications versus contraindications, effects of ultrasonic scalers on hard and soft tissue including root damage, enamel damage, thermal damage and soft tissue damage as well as safety in regards to patient with systemic medical complications and managing patients with pacemakers. In addition to ultrasonic basics criteria, use of instruments and fulcruming techniques, infection control protocols in relation to removal of excess cement using an ultrasonic scaler, use of PPE and instrument processing.

DIDACTIC SESSION

2 Hours

1. Introduction to Ultrasonic Scaling
    a. Review of OSHA Infection Control Protocol and Dental Board Regulations
    b. Review of Laboratory and Clinical Training Site Emergency Protocol
    c. Patient Requirements for Clinical Practice at Dental Facility
    d. Examination Requirements
    e. Procedures for Handling Dental Patients during Clinical Practice
    f. Supplies and Equipment Use
    g. Demonstration of Equipment
2. Proper Use and Care of Ultrasonic Cleaning Device
3. Infection Control During Ultrasonic Scaling for Cement Removal
4. Techniques and Use of Equipment
    a. Operator/patient positioning
    b. Device grasp
    c. Device types
5. Patient Health
    a. Indications and contraindications
    b. Health history
6. Procedure Outline

LABORATORY SESSION

4 Hours

During this session, students will practice ultrasonic scaler use in the removal of orthodontic cement from around bands and/or brackets on typodont teeth. Instructor will describe and demonstrate the following: criteria for ideal use of the ultrasonic scaler with appropriate selection and adaptation of tips, use of a fulcrum, operator/patient positioning, worksheet, product evaluation forms. Students will work with a partner during the process of these procedures; the assisting student will observe each state of the process for evaluation. Student, partner and instructor will evaluate all laboratory practice using stated criteria, worksheet and product evaluation sheets.

PRECLINICAL SESSION

4 Hours

During this session, students will continue practice of the use of the ultrasonic for removal of orthodontic cement on a minimum of four banded posterior first molars.

WRITTEN FINAL EXAMINATION

1 hour

A comprehensive written examination on all aspects of the course will be administered. Questions will appear on the exam in multiple choice, true/false or matching form. These questions will be chosen from a test bank. An item analysis will be conducted to determine question validity each time the examination is administered.

CLINICAL SESSION

4 Hours

Working with a partner, each student functions as operator using an ultrasonic scaler to remove orthodontic cement from four posterior first molars on a minimum of two patients. Student will function as an assistant and will observe and evaluate ultrasonic use in removal of cement with a partner.

Laboratory, Preclinical and Clinical Instruction

LABORATORY SESSION

4 Hours

During this session, students will practice ultrasonic scaler use in the removal of orthodontic cement from around bands and or brackets on typodont teeth.

Laboratory Instructions

Students will work with a partner during the process of these procedures. The assisting student will observe each stage of the process for evaluation. The following is a step-by-step description of the procedures that should be followed during the laboratory practice sessions:

1. Each student will set up his/her armamentaria for ultrasonic scaler use in the removal of orthodontic cement from around bands and/or brackets on typodont teeth.
2. Student will be provided with a typodont and a bench mount and at least four posterior typodont teeth. In addition, the student will be provided with individualized packets that will include:
    a. Description of packet
    b. Assortment of typodont teeth with bands or brackets with excess cement for removal using the ultrasonic scaler
    c. All armamentarium for cement removal with an orthodontic scaler
3. Instructor will review procedures and present information on how to use the lab worksheet for ultrasonic scaler use in the removal of orthodontic cement from around bands and or brackets on typodont teeth.
4. Instructor will present criteria for ideal cement removal with an ultrasonic scaler. Instructor will demonstrate techniques and provide ideal examples that will be passed around for viewing.
5. Student will remove cement with an ultrasonic scaler from around brackets or bands on typodont teeth, partner observes, evaluates and records on worksheet.
6. Partner observes, evaluates and records on worksheet. Student will also evaluate him/herself on the procedure. Instructor evaluates the cement removal process. The entire process will continue to be evaluated on the worksheet by the student, partner/assistant and instructor.
7. Partners switch places, the operator becomes the assistant, and the assistant becomes the operator. Both students complete three typodont teeth.
8. Instructor will now present product evaluation form and how it is used to evaluate final cement removal with an ultrasonic scaler around orthodontic bands on typodont on four first molars with cemented bands.
9. Using the product evaluation form, the student operator and the student assistant and instructor grade the final cemented orthodontic bands for each other.
10. Discussion on product evaluation is conducted in small groups.

PRECLINICAL SESSION

4 Hours

During this session, students continue practice of ultrasonic scaler use in the removal of orthodontic cement from around bands and or brackets. Student partners work on each other in simulation as previously described and demonstrated by instructor. The following general procedures occur:

1. Each student will set up his/her armamentaria for ultrasonic scaler use in the removal of orthodontic cement from around bands and or brackets
2. Operatory will be set up following the infection control guidelines.
3. Medical history will be completed by student/patient prior to seating.
4. Equipment and supplies will be checked by student.
5. Student/patient will be seated and prepared for treatment.
6. Student operator will review medical history and perform a patient assessment; instructor will follow-up with same procedures.
7. Patient is given instructions/explanation of procedures.
8. Student operator will perform the following according to the stated criteria:
    a. Identify teeth with excess cement around orthodontic bands or brackets
    b. Remove cement around orthodontic bands or brackets with an ultrasonic
    c. Remove excess cement remaining supra-gingivally with no tissue damage
    d. Rinse and remove isolation products
    e. Evaluate the product
    f. Provide individualized patient education

g. Dismiss the patient

h. Make appropriate chart notes

i. Perform operatory clean-up/instrument processing according to infection control

After the student operator completes the sequence of procedures, the student operator, the assistant and the instructor will evaluate the performance of the student operator using the worksheet and product evaluation.

During this time period the following procedures will occur:

1. The student/operator will evaluate his/her own work according to stated criteria using the worksheet and product evaluation forms.
2. The student/assistant will assist, observe and evaluate operator's performance according to criteria using the worksheet and product evaluation forms.
3. The instructor will evaluate both students' work/ performance using stated criteria using the worksheet and product evaluation forms. Discussion on results will be conducted.

WRITTEN FINAL EXAMINATION

1 hour

CLINICAL INSTRUCTION

4 hours

During this session, the student will practice ultrasonic scaler use in the removal of orthodontic cement from around bands on two active patients. Students will work with a partner during the process of these procedures the assisting student will observe each stage of the process for evaluation. Student operator will perform the following according to the stated criteria:

1. Each student will set up his/her armamentaria for ultrasonic scaler use in the removal of orthodontic cement from around bands and or brackets
2. Operatory will be set up following the infection control guidelines.
3. Medical history will be completed by student/patient prior to seating.
4. Equipment and supplies will be checked by student.
5. Patient will be seated and prepared for treatment.
6. Student operator will review medical history and perform a patient assessment; instructor will follow-up with same procedures.
7. Patient is given instructions/explanation of procedures.
8. Student operator will perform the following according to the stated criteria:

a. Identify teeth with excess cement around orthodontic bands or brackets

b. Remove cement around orthodontic bands or brackets with an ultrasonic

c. Remove excess cement remaining supra-gingivally with no tissue damage

d. Rinse and remove isolation products

e. Evaluate the product

f. Provide individualized patient education

g. Dismiss the patient

h. Make appropriate chart notes

i. Perform operatory clean-up/instrument processing according to infection control guidelines

After the student operator completes the sequence of procedures, the student operator, the assistant and the instructor will evaluate the performance of the student operator using the worksheet and product evaluation.

During this time period the following procedures will occur:

1. The student/operator will evaluate his/her own work according to stated criteria using the worksheet and product evaluation forms.
2. The student/assistant will assist, observe and evaluate operator's performance according to criteria using the worksheet and product evaluation forms.
3. The instructor will evaluate both students' work/ performance using stated criteria using the worksheet and product evaluation forms. Discussion on results will be conducted.

Worksheets

LABORATORY & CLINICAL PATIENT WORKSHEETS

General Information on Worksheets

The student operator, student assistant, and instructor use these forms. Each of these individuals will watch the performance of the specified steps of the given procedure and then identify if any of these steps are not followed and/or inadequately performed by the student operator. During the learning process, errors can and will occur. Students and clinical instructors identify common errors encountered during each step of the entire procedure utilizing the worksheets. Worksheets are not grade sheets, but they assist the student to identify his or her own errors during performance of these steps. They are used for measuring student's progress toward attainment of clinical proficiency.

General Procedures

An important part of the learning experience in the process of removing cement with an orthodontic scaler is the ability to identify technique errors, understand their causes and find solutions. Equally important is to determine the degree of error and when it constitutes remedial assistance. The first step in this process is to identify the error(s). Using the Removal of Cement with an Ultrasonic Scaler Laboratory and Clinical Patient Worksheets does this. The worksheets are not grade sheets but are documents that are used to assist students in learning to identify common technique errors related to the procedures associated with removal of cement with an ultrasonic scaler. The student uses this form in the following manner:

The worksheet consists of a column titled Procedure-Laboratory and Procedure-Clinical, which is the step-by-step description of the procedures associated with removal of cement with an ultrasonic scaler. The procedures are subdivided into the following categories:

- Infection Control/Patient Safety
- Assemble Armamentaria
- Patient Considerations
- Equipment Care & Usage
- Protecting/Avoiding Damage to Components of Tooth and/or Band or Bracket
- Patient Education
- Infection Control/Patient Safety/Clean-up

How Worksheets Are Used by Student Operator and Student Assistant

1. When performing multiple procedures either in the laboratory or on clinical patients, all of the errors from these series are placed on one worksheet.
2. Each laboratory/clinical experience is graded in a different column.
3. When an error occurs in any of the individual steps described in the Procedure column, a check is placed in the box corresponding to the laboratory/clinical experience.

For example, on the clinical patient worksheet there would be a box for each step of the clinical practice patients. For the laboratory worksheet, there would be a box for the typodont teeth. With worksheet check-offs, the student can identify a clustering pattern of errors in any particular step. When an instructor evaluates the student's performance, he/she cannot only see how a student performs, but whether or not the student can identify errors that he/she makes.

How the Student Identifies Cause and the Correction of Errors

After the student identifies the error(s) performed, he/she will write the cause of the error and how it shall be rectified. The student then identifies whether the error is significant enough to require remedial assistance. During this process, the student will review the criteria for successful cement removal around orthodontic bands or brackets with an ultrasonic scaler.

How the Instructor Uses the Worksheets

The instructor watches the student operator during the entire process of cement removal around orthodontic bands or brackets with an ultrasonic scaler. The instructor will check the appropriate box on the same worksheet used by the student operator and the student assistant. The instructor observes both students, and then evaluates the grading completed by both students for accuracy. The instructor reviews the worksheets for information related to: cause, solution and whether any part of the procedure requires additional steps. The instructor can provide additional assistance where needed. This process of identification of errors, causes and solutions will ensure the student will progress towards clinical competence and expected course objectives will be met. This process will continue throughout all laboratory and clinical requirements. When the clinical final exam is administered the student should be clinically competent in cement removal around orthodontic bands or brackets with an ultrasonic scaler.

Satisfactory Performances of Psychomotor Skills

Students will practice psychomotor skills during the laboratory and preclinical sessions until they reach a competence level of 75% utilizing the documented criteria evaluated using the behaviorally anchored rating scale. Students must achieve a passing score on a minimum of two typodont teeth or natural teeth before progressing on to successive laboratory, preclinical and clinical sessions.

Worksheet – Laboratory/Preclinical

ULTRASONIC SCALING FOR CEMENT REMOVAL

Date:

Student/Operator Name:

Student/Assistant Name:

Faculty Name:

Cement removal on minimum of 2 banded first molars. Record tooth number(s):

*** = Critical Error**

Infection Control/Armamentarium	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
Infection Control/Patient Safety			
1. Barriers placed on chair, unit, air-water syringe, HVE, saliva ejector, ultrasonic scaler			
2. PPE: mask, gloves, scrubs, gown, eye wear, patient safety glasses			
Assemble Armamentaria			
3. Basic set-up: mirror, explorer, cotton pliers			
4. Air-water syringe, syringe tip, HVE, saliva ejector			
5. Ultrasonic scaler			
6. Ultrasonic scaler tip/insert			
7. Isolation products-long and short cotton rolls, cheek retractors, tongue guard/ etc.			
8. Typodont with appropriate teeth and bench mount/pole			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Verify Teeth for Cement Removal	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
9. Verify teeth for cement removal*			
10. Use ultrasonic scaler/tip to safely remove the cement from the tooth with light sweeping movement to preserve integrity of hard and soft tissue*			
11. Primary focus is patient safety; maintain integrity of hard and soft tissue and prevention of swallowed or aspirated cement and or water*			
12. Teeth that have restorations takes special care when removing cement*			
Identify Excess Cement			
13. Use an instrument to "feel" for visual inspection may not be reliable*			
14. Use explorer to detect residual cement*			
15. Inspect the interproximal areas where excess cement may be hiding*			
Remove Excess Cement			
16. Use modified pen grasp to remove excess cement with a sweeping motion using an ultrasonic scaler while employing a secure fulcrum*			
17. Suction small fragments as they are removed as well as remove water*			
18. All excess cement is removed with out damage to hard or soft tissue around bands and brackets supra-gingivally*			
19. Check for loose bands or brackets*			
20. Rinse and suction remaining debris*			
21. Remove any remaining isolation materials and rinse well*			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Patient Education	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
22. Give post-operative instructions to the patient or parent			
23. Document procedure in patient chart to include: date, HH review or update, teeth where cement was removed, problems encountered, operator signature, and instructor or DDS signature			
Infection Control/Patient Safety/Clean-Up	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
24. Surface disinfect			
25. Prepare and institute sterilization procedures			
26. Manage PPE: gloves, mask, gown, scrubs, eye wear and patient safety glasses			
27. Unit is checked for completion			

Comments:

STUDENT OPERATOR EXPLANATION OF CHECKMARKS

Procedure #s

Cause(s)

Solution(s)

Re-do? Yes No Tooth #s

Worksheet – Clinical Patient

ULTRASONIC SCALING FOR CEMENT REMOVAL

Date

Student/Operator Name

Student/Assistant Name

Faculty Name

Circle one: Patient #1 Patient #2

Patient Name

Cement removal on minimum of 2 banded first molars. Record tooth number(s):

Use this worksheet to identify errors in procedures. Place a check mark in the box each time a step in the procedure is incorrectly performed or omitted. After each section, the instructor will check before the student continues with the following section.

Infection Control/Armamentarium	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
Infection Control/Patient Safety			
1. Barriers placed on chair, unit, air-water syringe, HVE, saliva ejector, ultrasonic scaler			
2. PPE: mask, gloves, scrubs, gown, eye wear, patient safety glasses			
Assemble Armamentaria			
3. Basic set-up: mirror, explorer, cotton pliers			
4. Air-water syringe, syringe tip, HVE, saliva ejector			
5. Ultrasonic scaler			
6. Ultrasonic scaler tip/insert			
7. Isolation products-long and short cotton rolls, cheek retractors, tongue guard/ etc.			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Verify Teeth for Cement Removal	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
8. Verify teeth for cement removal*			
9. Use ultrasonic scaler/tip to safely remove the cement from the tooth with light sweeping movement to preserve integrity of hard and soft tissue*			
10. Primary focus is patient safety; maintain integrity of hard and soft tissue and prevention of swallowed or aspirated cement and or water*			
11. Teeth that have restorations takes special care when removing cement*			
Identify Excess Cement			
12. Use an instrument to "feel" for visual inspection may not be reliable*			
13. Use explorer to detect residual cement*			
14. Inspect the interproximal areas where excess cement may be hiding*			
Remove Excess Cement			
15. Use modified pen grasp to remove excess cement with a sweeping motion using an ultrasonic scaler while employing a secure fulcrum*			
16. Suction small fragments as they are removed as well as remove water*			
17. All excess cement is removed with out damage to hard or soft tissue around bands and brackets supra-gingivally*			
18. Check for loose bands or brackets*			
19. Rinse and suction remaining debris*			
20. Remove any remaining isolation materials and rinse well*			

STOP! REMINDER INSTRUCTOR CHECKS PRIOR TO PROCEEDING TO NEXT SECTION.

Comments:

Patient Education	Operator Evaluator	Assistant Evaluator	Faculty Evaluator
21. Give post-operative instructions to the patient or parent			
22. Document procedure in patient chart to include: date, HH review or update, teeth where cement was removed, problems encountered, operator signature, and instructor or DDS signature			
Infection Control/Patient Safety/Clean-Up	**Operator Evaluator**	**Assistant Evaluator**	**Faculty Evaluator**
23. Surface disinfect			
24. Prepare and institute sterilization procedures			
25. Manage PPE: gloves, mask, gown, scrubs, eye wear and patient safety glasses			
26. Unit is checked for completion			

Comments:

STUDENT OPERATOR EXPLANATION OF CHECKMARKS

Procedure #s

Cause(s)

Solution(s)

Re-do? Yes No Tooth #s

Product Evaluation Forms

ULTRASONIC SCALING FOR CEMENT REMOVAL

General Procedures

Product evaluation evaluates the end result of any performance, not the steps. This facility utilizes the behaviorally anchored rating scale (BARS) system. This 10-point system clusters the critical incidents into categories. The instructor can score objectively the end result of cement removal with an ultrasonic scaler by choosing the criteria specified in each point level. Performance is assessed according to established criteria for each of these procedures. The points are then converted to a pass or fail grade.

How Instructor Uses Product Evaluation Form

A product evaluation form will be used for each patient. In the "scores" area on the form you will note that an open box rather than specific grids occurs. This open box allows you to enter a score for each of the posterior first molars.

The student must maintain a minimum point value of 7.5 on all clustered critical incidences per tooth. He/she must receive this minimum score for all four posterior first molars selected for cement removal with an ultrasonic scaler in order to pass this module. A grade of 7.5 represents a 75% passing score.

Product Evaluation Point Conversion

The student will receive points for a given level of achievement from the point scale utilized for product evaluation.

POINT SYSTEM TO A PASS/ FAIL SCORE

Conversion

Points	Grades
10	➨ Pass-Excellent
7.5	➨ Pass
5	➨ Fail-Critical Error(s)
3	➨ Fail-Critical Errors-no concept

Product Evaluation/Practical Examination – Lab Session

ULTRASONIC SCALING FOR CEMENT REMOVAL

Student Name:

Patient Name: Typodont

Minimum number of satisfactory performances:

3 banded first molars for cement removal. Record tooth number(s):

*** = Critical Error**

VERIFY TEETH/IDENTIFY CEMENT FOR REMOVAL

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Excess cement verified* B. Teeth identified*		

REMOVAL OF EXCESS CEMENT

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Excess removal was accomplished* B. No evidence of damage to hard or soft tissue or to band or bracket*		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation/Practical Examination – Preclinical Session

ULTRASONIC SCALING FOR CEMENT REMOVAL

Student Name:

Patient Name:

Minimum number of satisfactory performances:

3 banded first molars for cement removal. Record tooth number(s):

*** = Critical Error**

VERIFY TEETH/IDENTIFY CEMENT FOR REMOVAL

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Excess cement verified* B. Teeth identified*		

REMOVAL OF EXCESS CEMENT

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Excess removal was accomplished* B. No evidence of damage to hard or soft tissue or to band or bracket*		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation/Practical Examination – Clinical Session

ULTRASONIC SCALING FOR CEMENT REMOVAL

Student Name:

Patient Name:

Minimum number of satisfactory performances:

3 banded first molars for cement removal. Record tooth number(s):

*** = Critical Error**

VERIFY TEETH/IDENTIFY CEMENT FOR REMOVAL				
Date:	Grade Received:	Pass	Fail	Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Excess cement verified* B. Teeth identified*		

REMOVAL OF EXCESS CEMENT

Date: Grade Received: Pass Fail Faculty:

The following areas reflect the errors made that indicate a reduction in the grade.

Areas	Scores	Comments
A. Excess removal was accomplished* B. No evidence of damage to hard or soft tissue or to band or bracket*		

GRADING KEY: 10 = PASS-EXCELLENT | 7.5 = PASS | 5 = FAIL-CRITIAL ERRORS | 3 = FAIL-CRITIAL ERRORS NO CONCEPT

Student Signature: Date:

Instructor Signature: Date:

Product Evaluation Documented Criteria

VERIFY TEETH & IDENTIFY CEMENT	
Evaluation Criteria	
Points	**Description**
10 Points	➨ All teeth are identified with excess cement ➨ All excess cement is identified ➨ Proper use of explorer and or floss used to identify ➨ Uses modified pen grasp ➨ Uses stable fulcrum
7.5 Points	➨ All teeth are identified with excess cement ➨ Almost all excess cement is identified ➨ Proper use of explorer and or floss varies slightly from ideal ➨ Uses modified pen grasp quite well ➨ Uses stable fulcrum most of the time
5 Points	➨ All teeth are not identified with excess cement ➨ All excess cement is not identified ➨ Proper use of explorer is not employed ➨ Uses modified pen grasp only part of the time ➨ Does not use stable fulcrum consistently
3 Points	➨ All teeth are not identified with excess cement ➨ All excess cement is not identified ➨ Does not use explorer or floss for identification of cement ➨ Does not use modified pen grasp ➨ Does not use a fulcrum at any time

Product Evaluation Documented Criteria

CEMENT REMOVAL	
Evaluation Criteria	
Points	**Description**
10 Points	➨ Uses a modified pen grasp in the use of the ultrasonic tip ➨ Uses a light sweeping motion while using the ultrasonic tip ➨ Remains supra-gingivally while using the ultrasonic tip ➨ Uses fulcrum ➨ Manages water flow ➨ Uses HVE to control debris and water in oral cavity ➨ No loose bands detected at the end of cement removal
7.5 Points	➨ Uses a modified pen grasp adequately while using ultrasonic ➨ Uses a light sweeping motion but varies slightly ➨ Remains supra-gingivally while using the ultrasonic tip ➨ Uses fulcrum adequately ➨ Manages water flow adequately ➨ Uses HVE to adequately control debris and water ➨ No loose bands detected at the end of cement removal
5 Points	➨ Does not use a modified pen grasp while using ultrasonic ➨ Does not use a light sweeping motion while using the ultrasonic ➨ Does not remain supra-gingivally while using the ultrasonic ➨ Does not use a fulcrum ➨ Does not manage water flow, too much water ➨ Does not use HVE well to control debris and water ➨ A few loose bands are detected
3 Points	➨ Does not use a modified pen grasp while using ultrasonic ➨ Does not use a light sweeping motion while using the ultrasonic Does not remain supra-gingivally while using the ultrasonic ➨ Does not use a fulcrum ➨ Does not manage water flow, too much water ➨ Does not use HVE well to control debris and water ➨ Loose bands are detected

Course Requirements

The following is an overview of the course requirements and the protocol followed for laboratory and clinical practice, the written and clinical examination.

Minimum Number of Satisfactory Performances

All students will perform at a minimum the following procedures in order to achieve minimum competence in the various protocols used in the removal of cement with an ultrasonic scaler:

On a typodont and patients, the student will perform the following under OSHA and DBC guidelines:

- On the typodont: Complete cement removal at the very least on four posterior first molars a minimum of two times, with one used for a practical exam according to the specified criteria.
- On the patient: identify teeth with excess cement that will be removed with an ultrasonic scaler using proper technique with the focus on safety and comfort of the patient, as well as staying supra-gingivally with no damage to hard or soft tissue. Removing excess cement on four posterior first molars on at least two patients according to the specified criteria with one of each of the four times used for a practical examination with 75% accuracy.

Students are required to meet the specified minimal number of satisfactory performances as indicated above. The student operator grades his/her own performance, the student assistant grades the performance of the student operator and the instructor will assess the student operator's performance and the grading method of both students.

When the student reaches the 75% minimum performance for cement removal with an ultrasonic scaler and 100% performance on all infection control protocol, the instructor evaluates the procedure for the minimal number of satisfactory performances. If a student does not fulfill the minimum grade for the number of satisfactory performances additional laboratory and/or clinical practice procedures will be assigned.

Objective Evaluation Criteria

Objective evaluation criteria shall be provided to each student prior the performance of any procedure. The student will receive information provided by the instructor prior to performing any laboratory or clinical procedures. The instructor shall supply the student with general program, individualized cognitive and psychomotor objectives and criteria for evaluation. Objective criteria will be utilized in the performance of all laboratory and clinical requirements.

Preparation Prior to Cement Removal with an Ultrasonic Scaler

1. Will review the medical/dental history, make a general assessment, and oral inspection on each patient prior to treatment, checking for information that may contraindicate the performance of the procedure
2. Will set up the required armamentaria for removal of excess cement around bands or brackets with an ultrasonic scaler
3. Will use aseptic techniques according to OSHA and DBC throughout performance on all patients
4. Will place protective barriers, seat and position the patient
5. Will evaluate the teeth for cement removal with an ultrasonic scaler
6. Will explain to patient the treatment planned for that day
7. Will perform cement removal with an ultrasonic scaler
8. Will isolate four posterior first molars in preparation for cement removal with an ultrasonic scaler on two patients

Verify Teeth with Excess Cement and Identify Cement Criteria

1. Verify teeth with excess cement and identify cement.
2. Will remove excess cement using appropriate armamentarium (ultrasonic scaler).
3. Will proceed safely and with the patient's comfort as a primary focus as well as preventing damage to hard and soft tissues while staying supra-gingivally.
4. Will identify special circumstances that require adaptation to treatment to ensure no damage results to tissues or restorations.

Removal of Cement with Ultrasonic Scaler Criteria

1. Will remove excess cement with an ultrasonic scaler around bands and brackets
2. Will explore areas where excess cement will be found
3. Will remove excess cement supra-gingivally with an ultrasonic scaler
4. Care will be taken to use a stable fulcrum
5. Care will be taken while using a light sweeping motion with the ultrasonic scaler when removing excess cement
6. Will be meticulous in monitoring debris to prevent swallowing or aspirating residual cement
7. Will take care not to injure soft or hard tissues

General Criteria

1. Will provide pertinent and individualized patient education
2. Will provide follow up appointment as identified in the treatment plan
3. Will meet ethical and legal requirements for this procedure
4. Will provide accurate chart entries for this procedure
5. Will utilize OSHA and DBC guidelines for instrument processing, removing waste and cleaning/disinfecting treatment area

The above criteria will be used to evaluate and assess appropriate removal of cement around orthodontic bands and brackets while using the ultrasonic scaler

with a minimum of 75% accuracy for laboratory and clinical patients.

General Clinical Practice Protocol

Students will complete procedures on two clinical patients. The following general procedures will occur:

Patient Selection Criteria

The following criteria must apply for each patient:

1. Patient must be an active orthodontic patient
2. Patient must be in good health (medical history form will be completed prior to treatment, reviewed and approved by the instructor)
3. Each patient will have a minimum of four posterior first molars with bands

The student will function as an operator, an assistant and a patient. Working as partners (operator and assistant) an operator will perform the procedure, the assistant will observe, and evaluate each step of the procedure. When complete each student will do the procedure, observe and evaluate.

The following general procedures will occur for each of the patients:

1. Operatory will be set up following the infection control guidelines
2. Medical history will be completed by the patient prior to seating
3. Equipment and supplies will be checked by the student
4. Patient will be seated and prepared for treatment
5. Student operator will review the medical history and perform a visual exam
6. The instructor will review the medical history and perform a visual exam
7. Instructor will accept the patient for cement removal with an ultrasonic scaler
8. Student operator will perform the following according to the stated criteria:
    a. Identify teeth with excess cement around orthodontic bands or brackets
    b. Remove cement around orthodontic bands or brackets with an ultrasonic
    c. Remove excess cement remaining supra-gingivally with no tissue damage
    d. Rinse and remove isolation products
    e. Evaluate the product
    f. Provide individualized patient education
    g. Dismiss the patient
    h. Make appropriate chart notes
    i. Perform operatory clean-up/instrument processing according to infection control guidelines

After removing excess cement with an ultrasonic scaler procedures, the student operator, student assistant and the instructor complete evaluation using the worksheet and product evaluation form.

During this time period, the following will occur:

1. Student operator will evaluate his/her own work according to stated criteria using worksheet and product evaluation forms.
2. Student assistant will assist, observe, evaluate operator's performance according to stated criteria using the worksheet and product evaluation forms.
3. The instructor will evaluate both students' work according to stated criteria using the worksheet and product evaluation forms. Results will be discussed.

A 75% must be obtained for passage of removal of cement around orthodontic bands or brackets with an ultrasonic scaler on a practice patient and a minimum of two clinical patients.

General Examination Protocol

Written Examination

A comprehensive written examination of 20 questions on the entire curriculum will be administered. The student must receive a minimum score of 75% on the examination to pass the class. One hour has been reserved for the written examination.

Clinical Final Examination

The clinical final examination occurs during the process of working on the two active orthodontic patients during the removal of excess cement with an ultrasonic scaler on four posterior first molars following patient selection criteria and procedures outlined in the module's clinical practice protocol.

Written Examination

1. Which of the following would be considered a contraindication of using an ultrasonic scaler?
   a. Pregnancy
   b. Vitamin deficiency
   c. Headache
   d. Pacemaker
2. Which of the following would be considered the best position of utilizing a fulcrum during ultrasonic scaling?
   a. The tongue
   b. The lip
   c. The vestibule
   d. The adjacent tooth
3. Which is the most commonly used and preferred ultrasonic tip to use for orthodontic cement removal?
   a. Chisel
   b. Perio
   c. Beavertail
   d. None of the above
4. At what angle range should the operator use for tip placement in scaling off cement?
   a. 18 - 25 degrees
   b. 20 - 30 degrees
   c. 10 - 30 degrees
   d. 15 - 30 degrees
5. Which stroke pattern is to be used with the ultrasonic tip in removing cement?
   a. Up and down
   b. Side to side
6. Which term best describes the amount of water to be used as a coolant for the ultrasonic handpiece?
   a. Stream
   b. Halo
   c. Flood
   d. Maximum
7. When removing orthodontic cement, the ultrasonic tip should be placed where?
   a. On the enamel of the tooth
   b. On the band
   c. On the bracket
   d. On the cement
8. The tip of the ultrasonic scaler is always to reach under the sulcus.
   a. True
   b. False
9. The area most missed by the use of an ultrasonic scaler for cement removal is where?
   a. The distobuccal and distolingual surfaces of posterior teeth
   b. The distobuccal and distolingual surfaces of anterior teeth
   c. The mesiobuccal and mesiolingual surfaces of posterior teeth
   d. None of the above
10. What device will provide the maximum control/prevention measure during the spread of contaminated mist when using the ultrasonic handpiece?
    a. Saliva ejector
    b. Rubber dam
    c. HVE
    d. Patient bib
11. Using correct water flow and speed settings will _____ the potential for trauma during ultrasonic cement removal.
    a. Increase
    b. Decrease
    c. Not change
12. The use of _____ during scaling procedures will help reduce the level of bacterial contamination in the operatory?
    a. Surface barriers
    b. Alcohol
    c. Piezoelectric scalers
    d. None of the above

13. Which scaling device is made up of rods of ferromagnetic material which when magnetized create an elliptical motion of the tip?
    a. Magnetostrictive
    b. Piezoelectric
14. Which scaling device alternates electrical currents resulting in a linear or straight-line motion of the tip?
    a. Magnetostrictive
    b. Piezoelectric
15. Demineralized areas of the teeth may lose areas of remineralization due to_____ of the ultrasonic?
    a. Vibration
    b. Water
    c. Pressure
    d. Air
16. Under what level of supervision may a dental assistant perform ultrasonic scaling for cement removal?
    a. Direct
    b. General
    c. None of the above
17. Which edge of the ultrasonic tip should the operator use?
    a. Dull or flat
    b. Sharp or point
    c. None of the above
18. The correct operator zone for a right-handed operator would be:
    a. 6:00 - 10:00
    b. 7:00 - 12:00
    c. 12:00 - 5:00
    d. 12:00 - 4:00
19. The operator should always use _____ vision when using an ultrasonic scaler.
    a. Indirect
    b. Direct
20. Placing the patient in the _____ position will increase operator fatigue.
    a. Supine
    b. Sub-supine
    c. Semi- supine

Written Examination Answer Key

1. d
2. d
3. c
4. c
5. b
6. b
7. d
8. b
9. a
10. c
11. b
12. a
13. a
14. b
15. a
16. c
17. a
18. b
19. b
20. c