DENT 52 - Dental Materials and Procedures

Scope and objectives as required by American Dental Association and CA Code of Regulations

A. Ccourse and professional requirements
    1. Development and history of the science of dental materials
    2. American Dental Association Specification program and its importance to the profession and to the public
    3. Importance of a lmowledge of dental materials to the dental assistant
    4. How the course in dental materials will influence your responsibilities as a dental assistant
    5. General classroom safety procedures
    6. OSHA Regulations and MSDS requirements for dental materials and how they affect the members of the DHT; including the location for directions and education for personal care and safety
    7. CA Dental Board's Dental Material Fact Sheet and its use in dental offices
B. Dental materials and the oral environment
    1. Various factors present in the oral cavity which tend to alter the behavior of dental restoratives
    2. Values of biting forces, temperature changes and acidity fluctuation that occur in the oral cavity
    3. Various biological and physical (electrical and mechanical properties) considerations that are involved in the use and performance of dental materials
    4. Role of the American Dental Association, US Food and Drug Administration, FDI and the ISO in regard to the use and performance of dental materials
    5. Microleakage and its implications for the dental restoration
    6. Galvanism and galvanic currents
    7. Three classifications of restorative materials and select in what instance each would be used
C. Structures and properties of dental materials
    1. Relationship between the internal structure and the properties of a material
    2. Mechanical bonding and adhesion
    3. Stress, strain and three types
    4. Ductility and malleability and the method of measurement
    5. Flow and creep and importance of these properties
    6. Thermal conductively and thermal expansion and explain the dental significance
    7. Problems of adhesion as related to tooth structure
    8. Color of a dental material being an important consideration in restorative dentistry
    9. Three components of color and explain each one
D. Dental materials: selections and removable and fixed restorations
    1. dentures
    2. partials
    3. Maryland bridges
    4. acrylic crowns
    5. metal crowns and restorations
    6. ceramic/porcelain crowns, veneers and restorations
E. Plaster and dental stone
    1. Differences of various dental materials made from gypsum
    2. Importance of the water/powder ratio in the handling of gypsum products
    3. Factors that influence the setting time of plaster or stone
    4. Factors that influence the strength of plaster or stone

5. Classification of gypsum products and give an example of each
6. Step by step manipulation of and the construction of a cast/die
7. Importance of proper care of the plaster and stone powder, especially as related to moisture contamination
8. Uses of study model
9. Steps criteria for obtaining study models
10. Use of an articulator

F. Cavity indicators, varnishes/ desensitizers, liners, bases, and cements for provisional restorations
    1. Function of a cavity indicators, varnishes/desensitizers, liners and bases
    2. Armamentarium and knowledge of order, advantages, disadvantages of cavity indicators, varnishes/desensitizers
    3. Armamentarium, mixing and placement of liners and bases in prepared teeth on a manikin

G. Dental cements for luting provisional and permanent restorations
    1. Classification of all dental cements and various uses of each
    2. Meaning of luting
    3. Reasons why one type of luting cement cannot be used for all cast restorations
    4. Proportioning and manipulation of temp bond, polycarboxylates, glass ionomers, and resins; and the influence of all of the manipulative variables on the properties
    5. Advantages and disadvantages of zinc phosphate/silicophosphate, ZOE, polycarboxylates, glass ionomers and resins
    6. Zinc phosphate, polycarboxylate, glass ionomer, and resins in terms of
        a. composition
        b. setting reaction
        c. mechanism of adhesion to the tooth
        d. manipulation
        e. biocompatibility
    7. Glass ionomer cements as liners permanent cement, restorative and buildup materials
    8. Manipulation of temporary/permanent cements

H. Dental amalgam
    1. Reason of amalgam being first used in dentistry and the frequency of its use in a restorative material
    2. Factors controlled by the manufacturer and those controlled by the dentist and the dental assistant which influence quality ofthe final restoration
    3. Metals in an amalgam alloy and the effect of each
    4. Dimensional changes occur during the hardening process
    5. Physical properties of amalgam and the effect of manipulative variables on these properties
    6. Potential toxic effect of mercury to the patient and the
    7. DHT and the use of an amalgam separator
    8. Precautions to be taken to reduce the danger of mercury inhalation in the dental office
    9. Appearance of an undertriturated/overtriturated and correctly triturated mix of amalgam
    10. Operation of a mechanical amalgamator
    11. Amalgam condensation procedure and the factors to be observed in assuring a successful restoration
    12. Manipulation of amalgam integrating safety guidelines
    13. Effect of zinc-containing amalgam contaminated with moisture
    14. Polishing procedures for amalgam and the armamentarium for optimum results

I. Corrosion
    1. Corrosion and tarnish
    2. Elements present in the oral environment that may cause corrosion

3. Potential effects of dissimilar metal corrosion currents

J. Abrasion and polishing
    1. Difference of abrasion and cutting
    2. Various types of abrasive agents used with amalgam and acrylic
    3. Action and the end result of an abrasive agent and a polishing
    4. Polishing technique as applied to dental restorations

K. Synthetic resins/composites
    1. Synthetic resins/composites
    2. Requisites for dental resins/compostes
    3. Difference between a thermoset resin and a thermoplastic resin
    4. Monomer and polymer
    5. Difference in the composition of an unfilled acrylic direct restorative resin as compared to a composite resin
    6. Properties of flowable, micro filled and nano restorative materials
    7. Correct manipulative, insertion, and finishing techniques for composites and restorative materials
    8. Advantages and disadvantages of the visible light-cured resins as compared to the chemically and dual cured activate ones
    9. Various materials that utilize etching, bonding and primer materials
    10. Properties, uses, and armamentarium for various etches, primers, and bonds during numerous applications and the differences of techniques with the different generations of these materials
    11. Uses of resins in crown and bridge repairs and describe the problems associated with their use

L. Dental waxes
    1. Dental waxes and their uses
    2. Components present in inlay waxes and the effect of each
    3. Uses of baseplate wax
    4. Impression waxes
    5. Sticky waxes
    6. Proper armamentarium for the uses of waxes when pouring a stone cast
    7. Procedure in softening compound; its uses, and the cause for distortion

M. Trays
    1. Criteria for "stock' tray selection
    2. Types of stock and custom trays
    3. Fabrication of custom trays

N. Impression materials
    1. Use of final impression materials
    2. Types of final impression materials
    3. Criteria for final impression materials
    4. Steps for obtaining final impressions

O. Irreversible hydrocolloid
    1. Another name and the criteria for an irreversible hydrocolloid impression material
    2. Role of the ingredients in alginate impression powder
    3. Shelf-life of alginate powder
    4. Handling and manipulation (hand and machine) of alginate material, including proportioning, mixing, placement/removal of tray from mouth, disinfecting, pouring, and the separation of the cast

P. Elastomer/polyvinylsiloxane impression materials
    1. Elastomer/polyvinylsiloxane
    2. Four different chemical types of rubber base impression materials

3. Polymer, polymerization, and curing as these terms relate to the elastomer/polyvinylsiloxane impression materials
4. Two reasons of why custom impression trays are often used with elastomer materials
5. Function and use of a tray adhesive
6. Method of manipulation of elastomers and syringe/polyvinylsiloxane gun with tip/syringe materials and what is meant by working time and setting time
7. Dimensional stability of the various kinds of elastomers/polyvinylsiloxane
8. Special pre/post cautions that should be taken when pouring elastomer/polyvinylsiloxane impressions
9. Mixing light/heavy bodied and putty polyvinylsiloxane materials
10. Auto mixing machines

Q. Reversible hydrocolloid (demo only)
1. Manipulation of reversible hydrocolloid in regard to the following
    a. required armamentarium
    b. liquefaction ofthe material
    c. preparation of the removal from the mouth
    d. gelation in the oral cavity and
    e. removal from the mouth
2. Use of each compartment of the Hydrocolloid Conditioner
3. "Wet field" technique for use of hydrocolloid
4. Purpose of treating the impression with a 2% potassium sulfate solution before pouring the cast
5. Five of the most common difficulties encountered with reversible hydrocolloid and evaluate the most likely causes for these defects

R. Alginate impressions on typodonts and patients
1. Selection of correct tray
2. Mixing materials and loading differences of max. and man. trays
3. Placement and removal ofloaded tray with patient comfort and criteria for tissue, reproduction
4. Iinfection control policies and care of all types of impression prior to pouring

S. Periodontal dressing
1. Armamentarium and mixing methods for periodontal dressing material
2. Rationale for periodontal dressing
3. Ideal criteria for properly placed periodontal dressing
4. Mixing, placing and removing periodontal dressing on a typodont

T. Facebow, bite registration
1. Various materials and their components used for bite registrations and the rationale for use
2. Factors and chemicals that effect the heating and/or mixing and setting times of the various bite registration materials
3. Pastes are used in taking a secondary impression
4. Possible failures of various materials/placement
5. Proper mixing and placing of bite registration
6. Procedure of facebow, bite registration to the patient
7. Facebow parts and materials needed to obtain a facebow bite registration
8. Taking a facebow, bit registration following the steps necessary to obtain a bite that can be transferred to an articulator
9. Disinfection and sterilization procedures for the facebow, bite registration

U. Pouring and trimming casts
1. Three methods of pouring a model
2. Inverted pour method of pouring a model

3. Use of model trimmer and steps to obtain the anatomic and art portions of max. and man. models
4. Safe and standard trimming of cast