ORTHODONTIC LABORATORY

INCLUDES LAB EXERCISES ON:
HEAVY-WIRE BENDING
APPLIANCE CONFECTION

FACULTY: Antoine Bassil, LT.

Goals: This series of lectures and the following laboratory exercises should enable the resident to:
1. Be familiar with materials, tools and equipment used in the orthodontic laboratory.
2. Be familiar with most of the appliances and devices manufactured in the orthodontic laboratory.
3. Thoroughly understand the fabrication process of selected commonly used devices.
4. Apply the principles of appliance manufacturing from hard-wire bending and clasp/spring fabrication to soldering wire components, as well as acrylic manipulation.

Objectives: At the end of this series, the resident should:
1. Know the potential and limitations of the various appliances in the orthodontic armamentarium.
2. Prescribe and design the proper appliance adapted to different clinical situations.
3. Proficiently accomplish required wire-soldering tasks.
4. Fabricate selected removable and bondable/cementable appliances
   a. Nance holding appliance.
   b. Lingual holding arch.
   c. Quad-Helix.
   d. Removable retainer (Adams clasps, Hawley labial bows, acrylic body).

COURSE DURATION AND SCOPE: This course is scheduled between October and June for the first year residents. It is given every Wednesday at a 2.5-hour session between 2:30 p.m. and 5:00 p.m. and imparts fundamental knowledge on appliances and devices manufactured in the orthodontic laboratory.
POLICY ON EXAMINATIONS: 2 biannual examinations are given for this course, a progress in December and a final in July. During the course, practical assignments (on appliances fabrication) are given. Their cumulative weight grade may not exceed 50%, which is added to the grade of a final practical examination at the end of the first year.

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SUMMARY OUTLINE

INTRODUCTION, GOALS AND OBJECTIVES

- THE BASICS
- ORTHODONTICS MATERIALS
- TOOLS AND EQUIPMENT
- BASIC APPLIANCES AND FABRICATION TECHNIQUES
- COMPONENTS OF REMOVABLE APPLIANCES
- REMOVABLE APPLIANCE DESIGNS
- FIXED APPLIANCES DESIGNS
- NIGHTGUARDS
- DIAGNOSTIC SET-UP
- ACTIVATORS

COURSE OUTLINE

1. INTRODUCTION, GOALS AND OBJECTIVES

2. THE BASICS
   A. The Oral environment
      a. Dentition
      b. Overjet, overbite and crossbites
      c. Angle Classification of Malocclusions
   B. Biomechanics of tooth movement
      Degrees of efficiency of the amount of force placed on a tooth
   C. Types of movement

3. ORTHODONTICS MATERIALS
   A. Gypsum products
   B. Orthodontic study models
   C. Trimming orthodontic study models
   D. Metals in orthodontics: wire, tubing, bands
   E. Metal joining: solder, flux, soldering and spot welding
   F. Acrylic
4. TOOLS AND EQUIPMENT
   A. Stainless steel pliers
   B. Tungsten carbide inserts pliers
   C. Types of pliers
   D. Laboratory Equipment

5. BASIC APPLIANCES AND FABRICATION TECHNIQUES
   A. Classification by appliance usage
   B. Classification by insertion
   C. Retention?
   D. Anatomy of an ortho appliance
   E. Removable orthodontic appliance fabrication
   F. The basic Hawley retainer
   G. The basic Adams clasp
   H. Bending the Hawley
   I. The basic acrylic plate

6. COMPONENTS OF REMOVABLE APPLIANCES
   A. Clasps
      a. Adams clasp designs
      b. Other clasp designs
   B. Arches
   C. Posterior bite pads and anterior bite planes
   D. Anchorage
   E. Springs
      a. Lingual springs
      b. Labial springs
   F. Expansion screws
      a. Positioning a mid-palatal expansion screw
      b. Types of expansion screws
   G. Elastics, coil springs, hooks and lugs

7. REMOVABLE APPLIANCE DESIGNS
   A. Expansion appliances
   B. Common removable designs
   C. Functional appliances
8. FIXED APPLIANCES DESIGNS
   A. Banding
   B. Fixed appliances
   C. Fixed retention appliances
   D. Fixed expansion appliances
   E. Miscellaneous fixed appliances

9. NIGHTGUARDS
   A. Fabricating a Nightguard
   B. Gelb Splint

10. DIAGNOSTIC SET-UP
    A. Tooth Positioner
    B. Essix

11. ACTIVATORS
    A. Monoblock
    B. Twin-block

REFERENCES

VIDEOS
1. Sprinkling Techniques by Dentaurum.
2. Distal-Jet by American Orthodontics.