COURSE ID: ODO.33
PROPERTIES OF ORTHODONTIC WIRES

Includes:
Basics on physical properties of different archwires used in orthodontics
Indications of each type of archwire

FACULTY: Bilal Koleilat, DDS.

Goals: This series of lectures should enable the resident to:
1. Understand the physical properties and clinical application of orthodontic wires.
2. Know the clinical application of each type of archwire.

Objectives: At the end of this series, the resident should:
1. Be familiar with the properties of the different orthodontic archwires.
2. Have in depth knowledge in the characteristics, advantages, and disadvantages of these wires.
3. Be proficient in choosing the proper archwire for each clinical situation, and be aware of its possible actions and reactions on the teeth.
4. Know about the existing types of archwires present in the market, and be competent in their usage.
COURSE DURATION: This course is scheduled between October and Mid-November for the first year residents. It is given every Tuesday at a 1.5-hour session between 8:00 a.m. and 9:30 a.m. It includes fundamental knowledge on the properties of different wires used in orthodontics with their clinical implication.

EXAMINATIONS: One examination is scheduled for this course, it is usually given at the midterm examination in December. During the course, any number of progress tests or assignments may be given. Their cumulative weight in proportion to the final grade may not exceed 50%.

PROPERTIES OF ORTHODONTIC WIRES

SUMMARY OUTLINE
- INTRODUCTION
- PHYSICAL PROPERTIES OF WIRES
- THE MANUFACTURING PROCESS OF ORTHODONTIC WIRES
- THE DIFFERENT TYPES OF ORTHODONTIC WIRES
- LITERATURE REVIEW

COURSE OUTLINE

1. INTRODUCTION
   A. Why do we need orthodontic wires?
   B. The ideal orthodontic wire
   C. History of orthodontic wires

2. THE PHYSICAL PROPERTIES OF WIRE
   A. Stress, strain, load, deflection, range, strength, springiness, stiffness, formability, resilience.
   B. Stress /strain curve
   C. Geometric factors affecting the physical properties:
      a. Length
      b. Cross -section
      c. Size

3. THE MANUFACTURING PROCESS OF ORTHODONTIC WIRES

4. THE DIFFERENT TYPES OF ORTHODONTIC WIRES
   A. Gold wires
      a. History
      b. Composition
      c. Physical properties
B. Stainless steel wires
   a. History
   b. Composition
   c. Physical properties
   d. Clinical use

C. Chromium cobalt wires
   a. History
   b. Composition
   c. Physical properties
   d. Clinical use

D. Beta-titanium wires
   a. History
   b. Composition
   c. Physical properties
   d. Clinical use

E. Nickel titanium
   a. History
   b. Composition
   c. Physical properties
   d. Clinical use

F. Copper NiTi
   a. Characteristics
   b. Clinical application

G. Martensitic and austenitic nickel titanium
   a. The concept of the shape memory effect.

H. Multistranded wires
   a. Clinical application

I. The future of orthodontic wires: cosmetic wires

5. LITERATURE REVIEW
REFERENCES