Introduction to Operative Dentistry
Definition

- Operative Dentistry is the art and science of the prevention, diagnosis, treatment and prognosis of defects in the enamel and dentin of individual teeth.
History and Epidemiology

- Operative Dentistry was considered to be the entirety of the clinical practice of dentistry.

- Has been recognized as the foundation of dentistry and the base from which most other aspects of dentistry evolved.
History and Epidemiology

• In United States, dentistry originated in the 17th century when several barbers were sent from England.

• The practice of these early dentists consisted mainly of tooth extraction and practice of dentistry during the founding year was not based on scientific knowledge.
History and Epidemiology

• Baltimore College of Dental Surgery in 1840 ⇒ dental education

• Harvard University in 1867 ⇒ dental program

• In France, Louis Pasteur discovered the role of microorganisms in disease ⇒ have a significant impact on the developing dental + medical profession.
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• In United States, G.V. Black became the foundation of the dental professions ⇒ related the clinical practice of dentistry to a scientific basis.

• The scientific foundation for operative dentistry was further expanded by Black’s son, Arthur Black.
History and Epidemiology

• Others made significant contributions in the early development of Operative Dentistry:

  – Charles E. Woodbury
  – E.K. Wedelstaedt
  – Waldon I. Ferrier
  – George Hollenback
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• Operative Dentistry plays an important role in enhancing dental health and new branched into dental specialities.

• Today, O.D. continues to be a most active component of most dental practice.

• Epidemiologically, demand for O.D. will not ↓ in the foreseeable future.
Goal of Dental Sciences

- Elimination of disease and restoration of oral health, form and function.
Function and Purpose

• An understanding and appreciation for infection control.

• Examination not only the affected tooth but also the oral and systemic health of the patient.

• A diagnosis of the dental problem and must be correlated with other bodily tissues.

• A treatment plan that has a potential to return the affected area to a state of health and function.
Function and Purpose

• An understanding of **material** to be used to restore the affected area with a realization of both the material limitations and demands.

• An understanding of the **oral environment** into which the restoration will be placed.

• To understand the biological basis and function of the various **tooth components** and **supporting tissues** although the knowledge of correct **dental anatomy**.
Purposes of Operative Dentistry

**DIAGNOSIS**  Proper diagnosis is vital for treatment planning.

**PREVENTION**  To prevent any recurrence of the causative disease and their defect.

**INTERCEPTION**  Preventing further loss of tooth structure by stabilizing an active disease process.

**PRESERVATION**  Preservation of the vitality and periodontal support of remaining tooth structure.

**RESTORATION**  Includes restoring form, function, phonetics, and esthetics.
The placement of a restoration in a tooth requires the dentist to:

- Practice applied human biology + microbiology
- Possess highly developed technical skills
- Demonstrate artistic abilities
Type of Lesion in Tooth Destruction

- Dental caries
- Tooth wear
- Trauma
- Developmental defect
Dental Caries

- Dental caries is an infectious microbiological disease of the teeth that results in localized dissolution and destruction of the calcified tissue, caused by the action of microorganisms and fermentable carbohydrates.
Dental Caries

Characterized by

- Demineralization of the mineral portion of enamel + dentine.

- Disintegration of their organic material.

- As the disease approach the pulp may result in death of the pulp.

- It can be arrested or prevented.
Classification of Decay

- Based on anatomy of the surface involved
- Pit and fissures carious lesions
  - **Class I** – begin in the depth of pits and fissures in enamel
  - **Occur:**
    - *Occlusal surface of post. teeth*
    - *Lingual fossa of maxillary incisors*
Smooth Surface Carious Lesions

- Occur on the smooth surface of the anatomic crown of a tooth in areas that are most inaccessible to the natural cleansing action of the lips, cheeks, and tongue.
  - Proximal surfaces – class II
  - Facial and lingual surfaces – class III, IV, V
- Root caries on cementum
Tooth Wear

• Maybe defined as the surface loss of dental hard tissues other than by caries or trauma.
  • \textit{Erosion}:
    – Loss of dental hard tissue as a result of a \textbf{chemical process} \textit{not involving} bacteria.
      • Causative agent ⇒ \textit{acid}
      • Source of acid ⇒ \textit{dietary, stomach}
      • Affected area ⇒ \textit{palatal surface ant., buccal surface post.}
Tooth Wear

- **Attrition:**
  - Mechanical wear between opposing teeth commonly occurs in combination with erosion.

- **Causative agent** ⇒ *abrasive diet, bruxism*

- **Affected area** ⇒ *occlusal or incisal surface*
Tooth Wear

• **Abrasion:**
  – Wearing away of tooth substance by mechanical means other than by opposing teeth:
    • *Causative agent* ⇒ *over vigorous tooth brushing*
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Dish-shaped or V-shaped
Trauma

- Traumatic injuries are acquired suddenly.
- May involve the hard dental tissues and the pulp ⇒ required immediate operative management.

  - **Local injuries:**
    - Laceration of the lip, tongue, and gingival tissue
    - Fracture – alveolar bone, root, crown
    - Subluxation of a tooth
Developmental Defect

- Teeth do not always develop normally and there are a number of defects in tooth structure or shape which occur during development and become apparent on eruption.
- Teeth are often unsightly or prone to excessive tooth wear ⇒ require restoration to
  - Improve appearance or function
  - Protect the underlying tooth structure

Enamel hypoplasia
  - Hypo mineralized enamel
Enamel fluorosis
  - Tetracycline stain
Relationship between operative dentistry and other dental specialties

When an operative procedure is performed, there are general guidelines when operative treatment should occur relative to other forms of care like:

- Pedodontics
- Endodontics
- Periodontics
- Orthodontics
- Oral surgeries
- Prosthodontics
Relationship between operative dentistry and other dental specialties

**Pedodontics:** restorative treatment involved.

Pulpal / periapical area must be evaluated before operative therapy is initiated.

- Large restoration
- Cast restoration
- Improper root canal treatment
**Periodontics:** gingival treatment.

Generally periodontal tx. should precede operative care to create a more desirable environment for performing operative treatment.

Deep caries lesion often requires caries control or root canal treatment prior to periodontal treatment.
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- **Oral surgery**
  - Impacted, unerupted, and hopelessly involved teeth should be removed prior to operative treatment.
Orthodontics

Include extrusion or realignment of teeth to provide spacing, stress distribution, function and esthetics.

All teeth must be free of caries by operative treatment before ortho treatment is completed.
Relationship between operative dentistry and other dental specialties

- **Occlusions**
  - Occlusions should be evaluated
  - Occlusal adjustment should occur before the definitive restoration treatment occur.
**Fixed and removable prosthodontics**

- A restoration must be placed as a foundation to provide improved retention for a full crown.

- Cavity preparation and appropriate restorative materials must correlate with design of the contemplated removable prosthesis.
Factors Influencing Dental Practice

• Because of the dynamic status of dental practice, many developments and advancements will occur in the future.

• Advances in *technology, science and materials* will have a significant impact on the future of and demand for dental practice.

• Demographics ⇒ *population* ↑ and will change

  - Economic factors
  - Dental health
  - Dental manpower
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DR. NASRIEN ATEYAH
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