

# Introduction to Orthodontics

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# Definition of Dental Specialty

## Orthodontics

Orthodontics is a branch of dentistry concerned with the study, prevention, diagnosis, and treatment of irregularities in the alignment of teeth and jaws, as well as the associated abnormalities of facial growth and development.

1. Study.
2. Prevention.
3. Diagnosis.
4. Treatment of:
  - Teeth irregularities.
  - Jaw abnormalities.
  - Facial growth abnormalities.



# Aim of Orthodontic Treatment

- 1. Beauty:**
- Establish and maintain optimal teeth alignment.
  - Harmonious jaw relationships with the facial skeleton.
  - Improve facial and dental aesthetics.



- 2. Function:**
- Improve masticatory efficiency and speech
  - Ensuring long-term stability of teeth.
  - Improve oral health and oral hygiene.



- 3. Psychologic:**
- Improve patient psychologic behavior.
  - Improve personality.
  - Improve success.

# Normal Occlusion

- Normal occlusion refers to the way of contact between maxillary and mandibular teeth during functional and parafunctional activities of the mandible.
- Normal occlusion may be static during closure or dynamic during eating.

## Types of normal occlusion:

### 1. Normal occlusion in Maximum Intercuspation:

Stable bilateral maximum number of maxillary and mandibular teeth occluded together.

### 2. Normal occlusion in Lateral Movements:

- Canine-guided contact on the working side.
- No contacts on the non-working (balancing) side.

### 3. Normal occlusion in Protrusive Movements:

- Contact between the maxillary and mandibular incisors.
- Termed incisal guidance.



# Abnormal Occlusion = Malocclusion

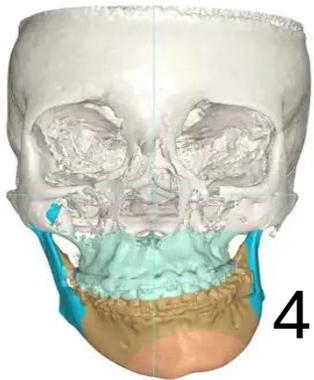
Malocclusion is an abnormal relationship between the maxillary and mandibular teeth.

## Types of malocclusions:

1. Irregularities in tooth position.
2. Irregularities in dental arches.
3. Skeletal Irregularities between the jaws.
4. Skeletal irregularities between jaws and base of the skull.



1



4



3



2

# Etiology of Malocclusion

## Genetic factors:

- Differences in jaw and teeth size between the parents.

## Developmental factors:

- Absence of tooth development (Anodontia).
- Increase in teeth numbers (Hyperdontia).
- Developmental diseases (Cleidocranial dysostosis).
- Abnormal in tooth shape (e.g. fusion of two teeth).
- Cleft palate.

## Oral habits:

- Thumb sucking cause open bite.
- Tongue thrusting.
- Premature loss of baby teeth.
- Prolonged retention of baby teeth.



# Classification of Orthodontic Treatment

## 1. Preventive Orthodontic Treatment:

Dentist maintain normal occlusion by preventing the development of malocclusion.

- Space maintenance after premature loss of primary teeth.
- Elimination of oral habits (thumb sucking, tongue thrust).
- Guidance of erupting teeth.



Removable space maintainer



Guidance of erupting premolar



Thumb sucking breaker



Fixed space maintainer

## 2. Orthodontic Treatment of Skeletal Irregularities: (Extraoral appliances)

**Must be diagnosed and begin to treat at the growth period as early as possible (6 years).**

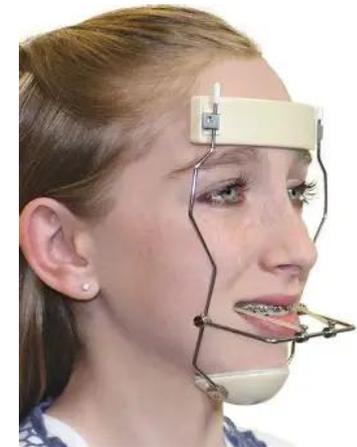
- Treatment is done by functional appliances.
- Mainly by extraoral appliances.

### **Types of appliances:**

1. Headgear.
2. Facemask therapy.



Headgear therapy



Facemask therapy

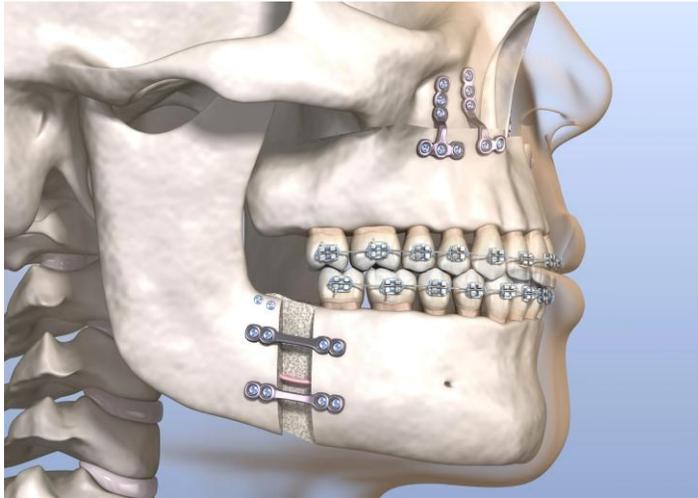
### 3. Orthodontic Treatment of teeth malocclusion

The optimal time of treatment 10-14 years.

- Treatment is done through intraoral appliances.
- May be combined with surgery (serial extraction).
- May be combined with orthognathic surgery.



Intraoral appliances



Orthognathic surgery



Serial extraction of first premolar

# Classification of Orthodontic Appliances

## 1. Removable orthodontic appliances:

### Definition:

They are devices that can be inserted and removed from the mouth by the patient.

### Indication:

Treatment of simple malocclusions as tooth tipping, minor arch expansion.

### The removable appliances consists of:

1. Acrylic base plate.
2. Active elements such as springs.
3. Retentive elements like clasps to maintain stability.

### Advantages:

- Simplicity of fabrication.
- Cheap cost.
- Good oral hygiene maintenance.
- Able to be adjusted or modified.



## 2. Fixed bracket and wire appliances :

### Definition:

**Fixed orthodontic treatment** is an orthodontic system attached to the teeth.

### Indication:

Treatment of mild to severe malocclusions that need complex movement.

### The fixed appliances consists of:

1. Brackets bonded to the tooth surfaces.
2. Arch-wires engaged within the bracket slots.
3. Auxiliary components such as elastics, and springs.

### Advantages:

- More efficient
- Do not need any patient action.

### Disadvantages:

- Need more oral hygiene control from the patient.



## 2. Orthodontic Retainers (passive appliances)

### Definition:

Orthodontic retainers are appliances used after active orthodontic treatment to maintain teeth in their new correct position to prevent relapse.

### Types of retainers:

1. Removable retainers with patient control.
2. Fixed retainers on the lingual surfaces of anterior teeth.

### Factors affecting the choice of retainers:

1. Type of malocclusion treated.
2. Patient compliance.
3. Esthetic demands.
4. Long-term stability requirements.



