Orthodontic appliances
removable appliance
fixed appliance

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Advantages of Removable Appliances

- The patient can continue with routine *oral hygiene* procedures.
- Easy to *adjust*.
- **Less risk** of iatrogenic damage than with fixed appliances.
- Most forms of *tipping movement* can be carried out successfully.
- Some of simple appliances can be monitored by the *general dentist*.
- Appliance fabrication is done in specialized labs so the *chair side time* is considerably less.
- A broken appliance is never an *emergency* for the clinician.
- These appliances are relatively *cheap* as compared to the fixed appliances.
Disadvantages of Removable Appliances

• *Patient cooperation* is the key word in removable appliance therapy.

• The appliances are capable of only certain *types of movements*.

• *Multiple movements* are difficult to carry out.

• The patient has to have a certain amount of *skill to be able to remove and replace* the appliance.

• Affects *speech*.

• The chance of appliance *loss or breakage* is more.
Components Of Removable Appliances

1. *Retentive components* usually include clasps.

2. *Active components* comprises of springs screws or elastics.

3. *Baseplate* can be made of cold cure or heat cure acrylic.
Examples:
I- Retentive Components

• These components help to retain the appliance in place and resist displacement due to active components (*fixation*).

• The *effectiveness* of the active components is dependent on retention of the appliance.

• Good fixation will help *patient compliance, anchorage* and *tooth movement*. 
Labial arch (labial bow) construction:

-Made from 0.7 mm round SS wire.

- Constructed in such a way that the bow contacts the most prominent labial surfaces of the anterior teeth, and ends in **two U-shaped loops** that extend as retentive arm between the canine and premolar before getting embedded in the acrylic base plate.

- the retentive arm is placed away from the tissue, and tags are made at the ends.
Labial arch (Hawley`s bow)

**Indication**: Used for both retention purposes, as a component of the Hawley`s retainer and can also bring about minor overjet reduction.

**Activation**: the bow is activated by compressing the loops of the bow by 1-2 mm and then adjusting the height of labial bow to lift it back to the desired horizontal position.

**Modification**: Long labial bow, labial bow soldered to Adam`s clasps, fitted labial bow ....
Clasps

Mode of action of clasps

• Between the maximum circumference of any tooth and anatomical neck, there are surfaces which slope inward towards the tooth axis are called undercuts.

• There are two types of undercuts:
  - The proximal undercuts.
  - The cervical undercuts.
Requirements of an ideal clasp

1. Easy to fabricate.
2. Provide adequate retention.
3. No interference with occlusion.
4. Should not apply active force.
5. Able to use on both fully and partially erupted teeth.
6. No injury on soft tissues.
Adams Clasp

- Devised by professor Adams in 1948, it makes use of the mesial and distal proximal undercuts of the first permanent molars.
• It is *simple, strong* and easily *insert and removed* by using the bridges of the clasp.

• It offers *excellent retention*.

• It can be used on *any tooth* be it incisor, premolars or molars deciduous and permanent teeth.

• *Good patient compliance* as it is comfortable to wear and resistant to breakage.

• A number of *modifications* enable its use in a wide variety of appliances.

• *No special instruments* is required for its fabrication.
II- Active components

**SPRINGS**

- Simple spring
  - without helix
- Compound spring
  - looped springs
  - helical springs
Designing a spring

- Thickness/diameter of spring
- Length of wire (incorporate helices or loops)

flexibility↑, force exerted↓

The springs are made up of thinner wire so they must be supported or boxed by acrylic to ensure adequate stability
**Finger spring**

It is constructed using 0.5 or 0.6 mm SS wire.

- Helix (3 mm)
- Active arm
- Retentive arm

The helix is positioned opposite to the direction of intended tooth movement.

It should also be placed along the long axis of the tooth to be moved and perpendicular to the direction of tooth movement.
Indication
- Mesio-distal movement of teeth
e.g. closure of anterior diastemas

Activation
Opening the coil or moving the active arm towards the tooth to be moved
2-3 mm of activation
**Z-spring (Double cantilever):**

A useful variation of the finger spring where a second limb is formed with a second coil.

**Construction:**

- **it** consists of 2 helices of small diameter can be made for 1 or more incisors.
- The spring is positioned perpendicular to the palatal surface of the tooth with a long retentive arm.
- The Z-spring needs to be boxed in wax prior to acrylization.
**Indication:**
- to move one or more teeth in the same direction

  *E.g.* proclining 2 or more upper incisors for the correction of anterior tooth crossbites.

- To correct mild rotation if only one helix is activated.

**Activation:**
By opening both the helices up to 2 mm at a time.