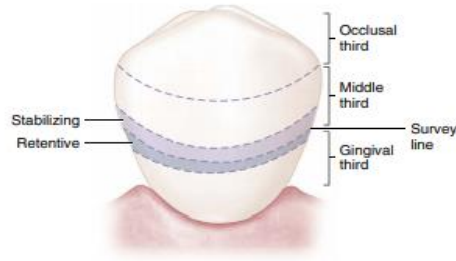


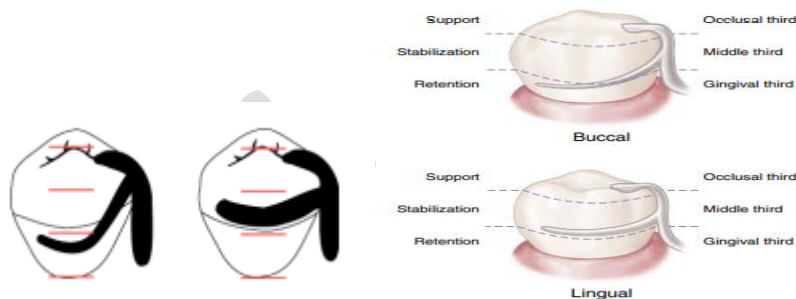
## Direct Retainers for RPD's

Clasps for tooth-borne partial dentures (Class III, IV) have one function (*to prevent dislodgment of the prosthesis without damage to the abutment teeth*). These clasps can also be used in modification spaces for tooth - tissue supported removable partial dentures (Class I, II).



### 1. Circumferential (Circle or Akers) clasp

- a. The most simple clasp.
- b. Clasp assembly has one retentive arm opposed by a reciprocal arm originating from the rest.
- c. The retentive arm begins above the height of contour, and curves and tapers to its terminal tip, in the gingival 1/3 of the tooth, well away from the gingiva.



- d. The bracing arm is in the middle 1/3 of the tooth, does not taper and is either entirely above the height of contour.

– *It should never be designed into an undercut, as it is a rigid element.*



**Advantages:**

- a. Excellent bracing qualities.
- b. Easy to design and construct.
- c. Less potential for food accumulation below the clasp compared to bar clasps.

**Disadvantages:**

- a. More tooth coverage than bar clasps.
- b. More metal is displayed than with bar or combination clasps.
- c. Adjustments are difficult or impossible due to the half-round nature of the clasp.

**2. Ring clasp**

- a. Encircles nearly the entire abutment tooth.
- b. Usually used with mesially and lingually tilted mandibular molars or mesially and buccally tilted maxillary molars.
- c. The undercut is on the same side as the rest seat.



**Advantages:**

- a. Excellent bracing (with supporting strut).
- b. Allows use of an available undercut adjacent to edentulous area.

**Disadvantages:**

- a. Covers a large area of tooth surface.
  - b. Very difficult to adjust due to the extreme rigidity of the reciprocal arms.
  - c. The lower bracing arm should be at least 1 mm from the free gingival margin and relieved to prevent impingement of the gingival tissues.
- Contraindications:** excessive tissue undercuts prevent the use of a supporting strut.

### 3. Embrasure (Double Akers) Clasp

- Used in a quadrant where no edentulous area exists, or where a distal approach clasp cannot be used on the most posterior tooth (i.e. No usable retentive undercut).
- Two rests, two retentive arms, and two bracing arms.
- Double rests with definite shoulders to prevent weakening of clasp arms, separation of teeth and food impaction.
- Buccal and lingual proximal areas must be opened (i.e. Blend with axial contours, reduce height of contours, round occluso-axial line angles).
- Use minimum retention – prone to distortion.
- Use with discretion – use another clasp if possible.



#### Advantages:

- a. Allows placement of direct retainer where none could otherwise be placed (especially contralateral to the edentulous span on a Class II case)

#### Disadvantages:

- a. Extensive interproximal reduction is usually required.
- b. Covers large area of tooth surface - hygiene considerations.

### 4. "C" clasp (Hairpin or Reverse action)

- a. The retentive area (undercut) is adjacent the occlusal rest.

b. The upper arm is a minor connector-giving rise to tapered lower arm.



**Advantages:**

a. Allows use of undercut adjacent to edentulous space.

**Disadvantages:**

a. Almost impossible to adjust.

b. Non-esthetic.

c. Difficult to fabricate so the upper portion of the retentive arm clears the opposing occlusion.

d. Covers extensive tooth surface and acts as a food trap.

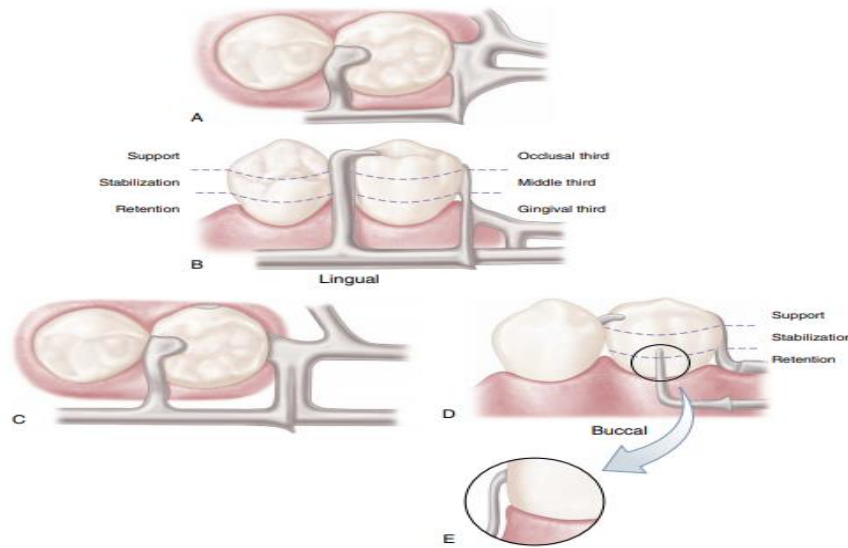
e. Insufficient flexibility on short crowns due to insufficient clasp arm length.

**Direct Retainers for Tooth and Tissue Borne RPD's**

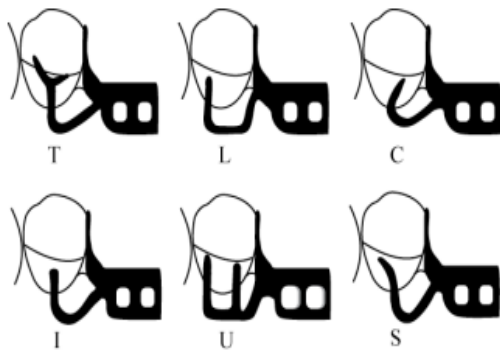
Tooth and tissue borne situations (Class I & II) require special attention in direct retainer selection, due to stresses created by rotational movements of the prostheses. When the denture bases are placed under function, rotation occurs about the rest seats of the posterior abutments. Excessive occlusal forces on the distal-extension portion of the denture could cause a torquing action on the abutment teeth unless direct retainers are designed with stress-breaking capabilities. Stress releasing clasp assemblies include:

1. The bar clasp with mesial rest (e.g. RPI)
2. The RPA clasp
3. The combination clasp

**1. Bar Clasps**



Retentive clasps are identified by shape of retentive terminal, i.e. T, Y, L, I, U, and S.



### Contraindications:

- Deep cervical undercuts - food trap or impingements result.
- Severe soft tissue or bony undercuts - food trap or impingements result.
- Insufficient vestibular depth for approach arm (requires 4 mm, 3 mm from free gingival margin, 1 mm for thickness of the approach arm).
- Pronounced frenal attachments in area – impingement.

### The R-P-I Clasp

1. The components of this clasp assembly are:

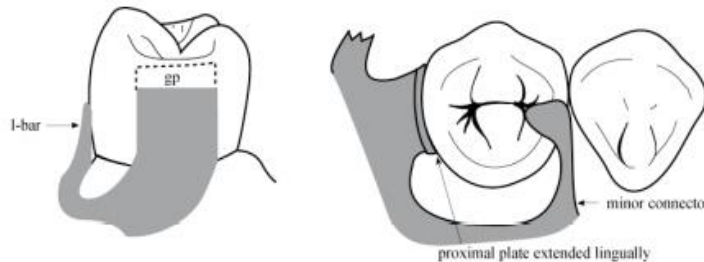
- "R" - Rest (always mesial).
- "P" - Proximal plate.
- "I" - I-bar (retentive arm).



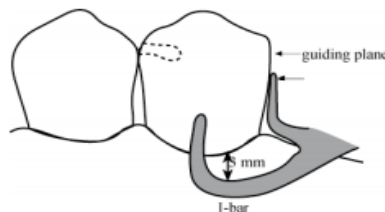
2. The rest is located on the mesio-occlusal surface of a premolar or mesiolingual surface of a canine. The minor connector is located in the mesio-lingual embrasure but is not in contact with the adjacent tooth (prevents wedging).



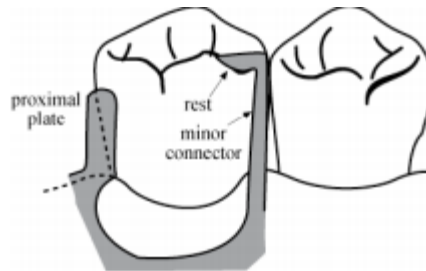
3. The proximal plate (essentially a wide minor connector) is located on a guide plane on the distal surface of the tooth. The plate is approximately 1 mm. thick and joins the framework at a right angle.



4. The I-bar clasp is located on the buccal surface of the premolar and on the mesio-buccal surface of the canine. The bend in the I-bar should be located at least 3 mm. from the gingival margin. This distance will prevent food entrapment and provide the length for the necessary flexibility in the clasp arm. The clasp is usually cast and is placed just below the height of contour line.



5. On premolars, the proximal plate should extend lingually so that the distance between the proximal plate and the mesio-occlusal rest is less than the mesio-distal width of the tooth.



6. The guiding plane is a parallel surface prepared on the occlusal one third of the distal surface of the tooth. The guiding plane extends lingually enough so that, along with the mesial rest, it can prevent lingual migration of the tooth. It is approximately 2 to 3 mm in height.

### **Contraindications to the R.P.I. Clasp**

1. Insufficient depth of the vestibule. (The inferior border of the I-bar must be located at least 4 mm. from the gingival margin.)
2. No labial or buccal undercut on the abutment
3. Severe soft tissue undercut
4. Disto-buccal undercut.

### **2. RPA Clasp**

This clasp assembly is similar to the RPI design except a wrought wire circumferential clasp (Akers) is used instead of the I-bar. This clasp arises from the proximal plate and terminates in the mesiobuccal undercut. It is used when there is insufficient vestibule depth or when a severe tissue undercut exists.



### **3. Combination Clasp**

The combination clasp is similar to the cast circumferential clasp with the exception that the retentive arm is fabricated from a round wrought wire (platinum-gold-palladium alloy or chromecobalt alloy).

- a. A cast reciprocal arm.
- b. The wrought wire is flexible (round form).
- c. More adjustable than cast or 1/2 round forms.
- d. Better esthetics (due to its round form and smaller diameter - 18 gauge).
- e. Can used with a mesial or buccal undercut.
- f. Can be placed in 0.02 undercut due to its flexibility (allows lower placement for better esthetics).
- g. Can be used in tooth borne cases as described earlier.
- h. For best results, the wire should be soldered remotely to the framework so it is not overheated, which would cause recrystallization of the metal and loss of flexibility. If wrought wire clasps are cast into the framework, a low heat chromium alloy should be used to avoid recrystallization as well.

