

Initial placement, adjustment, and servicing of removable partial dentures

Initial placement of the removable partial denture is the final steps for the removable partial dentures construction

The objectives of this appointment are:

- (1) To place the prosthesis and make it as comfortable as possible by evaluate and correct the fit of denture base, correct the occlusion, and adjust retentive clasps.
- (2) To teach the patient how to use the prosthesis.
- (3) To instruct the patient how to maintain the prosthesis and oral cavity.

The term adjustment has **two connotations**, each of which must be considered separately. **The first** is adjustment of the denture bearing and occlusal surfaces of the denture made by the dentist at the time of initial placement and thereafter. **The second** is the adjustment or accommodation by the patient, both psychologically and biologically, to the new prosthesis.

The timing of initial placement appointment:

1. The initial placement of the prosthesis should be early in the morning to have time for a double check after the patient used the prosthesis for several hour.
2. This appointment should not be placed in the last day of the week. It is important to give the patient the chance for a second appointment the day after.
3. Instruct the patient not being in a position to transact an important business attend social engagements immediately after the insertion.

Initial placement and adjustment procedure

Initial placement of the partial removable partial denture is the fifth of six essential phases of removable partial denture service. Insertion visit includes:

1. Final inspection of the prosthesis before insertion.
2. Verifying the RPD framework fit.
3. Assessment of acrylic resin denture base adaptation.
4. Assessment of peripheral extension of the denture base.
5. Evaluating occlusion.
6. Adjusting retentive clasp assembly.
7. Providing instructions for the patient in the use & care of the prosthesis.

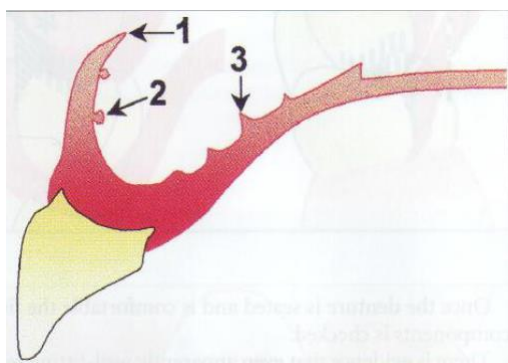
Final inspection of the prosthesis:

Prior to the insertion appointment, the dentist should check & adjust the following:

1. Nodules of acrylic resin on the tissue surface of the prosthesis: the simplest way to locate these nodules is to run a finger over the intaglio surface (tissue surface) of the prosthesis. Once identified & marked, the nodules can then be removed with a small, acrylic bur mounted in a slow-speed hand piece. When the nodule is removed, do not polish the tissue surface.
2. Surface and internal porosity in the acrylic resin reduces both the quality & ultimate strength of the completed RPD. A porous surface will be difficult to keep free of dental plaque. A rebase of the RPD is recommended.

3. Evaluate the denture- tooth acrylic resin junction. If the junction of the denture-tooth & acrylic resin denture base is improperly contoured & finished after processing, any crevices left in this area will become a potential site of food entrapment or staining.
4. Examine the acrylic resin/metal framework junction. The junction should be abut (90°) joint with no overlap of the acrylic resin onto the metal framework. All the acrylic resin flash should be removed so there is a smooth, continuous exactly duplicate the borders recorded in the transition between the materials.
5. Examine denture teeth for fractures that may have occurred during the processing or finishing procedures. Replace fractured teeth before the RPD is inserted.
6. Finally, inspect the finish and polish of the RPD. A poorly finished prosthesis may unfavorably affect the patient's attitude toward the dentist & diminish patient-dentist rapport. The polished surface contours should have a smooth, high-luster appearance without surface blemishes; that is a new appearance.

Store the RPD until the insertion appointment in a plastic bag partly filled with mouth wash & then heat sealed. This will keep the prosthesis moist to prevent dehydration & possible distortion of the acrylic resin base until the prosthesis is inserted.



Checking the Framework

Cast metal bases are not subject to the difficulties associated with polymerization shrinkage and usually do not require adjustment during the insertion appointment. Any correction to a cast metal base should have been performed at the framework try-in appointment. Borders of the prosthesis should be smooth and rounded, if not, checked to detect sharp edges and corrected its.

Checking the fit of denture base

The prosthesis should be seated gently in the patient's mouth along the determined path of placement. The prosthesis should be propriocepted (felt) for any resistance to insertion due to the presence of undercuts. The prosthesis should be relieved in the undercut areas. The pressure points, which require relief, are detected with the help of pressure indicating paste (PIP).

The paste should be applied by the dentist in a thin layer over the bearing surfaces. A stiff-bristled brush is used to coat the surface with a thin layer of pressure-indicating paste. The brush marks should be visible. The material should be rinsed in water so it will not stick to the soft tissue, and then digital pressure should be applied to the denture in a tissue-ward direction.

The patient cannot be expected to apply a heavy enough force to the new denture bases to register all of the pressure areas present. The dentist should apply both vertical and horizontal forces with the fingers in excess of what might be expected of the patient. The denture is then removed and inspected. Any areas where pressure has been heavy enough to displace a thin film of indicator paste should be relieved and the procedure repeated with a new film of indicator until

excessive pressure areas have been eliminated. Therefore only those areas that show through an intact film of indicator paste should be interpreted as pressure areas and relieved accordingly.

Pressure areas most commonly encountered are as follows:

❖ **In the mandibular arch**

- (1) The lingual slope of the mandibular ridge in the premolar area.
- (2) The mylohyoid ridge.
- (3) The border extension into the retromylohyoid space.
- (4) The distobuccal border in the vicinity of the ascending ramus and the external oblique ridge.

❖ **In the maxillary arch**

- (1) The inside of the buccal flange of the denture over the tuberosities.
- (2) The border of the denture lying at the malar prominence.
- (3) The point at the pterygomaxillary notch where the denture may impinge on the pterygomandibular raphe or the pterygoid hamulus.

The amount of relief necessary will depend on the accuracy of the impression, the master cast, and the denture base. Despite the accuracy of modern impression and cast materials, many denture base materials leave much to be desired in this regard, and the element of technical error is always present.

It is therefore essential that discrepancies in the denture base are detected and corrected before the tissues of the mouth are subjected to the stress of supporting a prosthetic restoration.



Checking the peripheral denture base extensions

Maximum flange extension, within physiologically tolerable limits provides optimal support and stability for the prosthesis. Extension of denture flanges into the facial vestibules and lingual sulci enhances resistance to horizontal displacement. Therefore, acrylic resin denture base flanges should not be arbitrarily reduced. Rather, they should be critically evaluated and adjusted only when physiologic limits have been exceeded.

Overextensions of denture base flanges may cause the following:

- ❖ The muscles and frena will tend to dislodge the prosthesis during function; the resultant dislodging force may be destructive to the abutment teeth especially in tooth-tissue supported removable partial denture.
- ❖ Overextensions interfere with the complete seating of the prosthesis.
- ❖ Overextensions may cause ulceration, pain and swelling of the vestibular tissues, if not corrected over a period time, a redundant tissue (inflammatory hyperplastic tissue) form in these tissues as a response to chronic irritation.
- ❖ Overextensions may cause muscle impingement that interfere with the muscle function.

Underextensions of denture base flanges may cause the following:

- ❖ Underextensions affect the support of the prosthesis due to inadequate distribution of masticatory force.
- ❖ Underextensions affect the stability of the prosthesis due to inadequate resistance to the lateral or horizontal stresses.
- ❖ Foods entrapments beneath the denture base of the prosthesis.

Visual and digital evaluation of the resin flanges should be performed during the placement appointment. The extension of the peripheral borders is determined by performing border-moulding movements and checking for lifting of denture. Overextensions are easily detectable due to the displacement of the prosthesis during function. Disclosing wax can be placed on denture base flanges to help identify areas of overextension.

In general, posterior denture base flanges should be at least 2mm thick and should display rounded borders. Flanges should be slightly thinner at the distolingual aspects of mandibular extension base removable partial dentures and distofacial aspects of maxillary extension base removable partial dentures. Decreased flange thickness in these areas provides additional tongue space in the mandibular arch and freedom of movement for the coronoid processes in the maxillary arch. The leading edges of maxillary and mandibular posterior denture base flanges also should be thinned. This helps to disguise the presence of the flange when the patient is viewed from the front during normal conversation and while smiling. Thick leading edges of posterior denture base flanges are often esthetically unattractive.

When designing a denture base for the anterior portion of the mouth, consideration must be given to the esthetic requirements of the patient. Careful

evaluation of the pressure indicator paste often will reveal excessive tissue contact along the border of the denture base. Correction of this interference involves vertical reduction of the flange length to the point of contact with the edentulous ridge. Once the anterior denture base flange has been adjusted to permit complete seating of the prosthesis, the superior and lateral margins of the flange are beveled to produce thin borders. This will permit a smooth transition from the denture base to the soft tissues, thereby producing a natural and esthetic effect.

The frena should be relieved appropriately; the notch like frenum relief is inspected in the denture to ensure adequate clearance, the margins of the relief should also be examined to avoid tissue injury, and finally excessive frenum relief will allow air entry between the denture and the tissues leading to loss of peripheral seal.

Following adjustment, the pressure indicator paste and grinding residue are wiped from all denture surfaces and fresh paste is applied. This procedure is repeated until the removable partial denture can be completely seated without encountering resistance, producing blanching of the soft tissues, or causing patient discomfort.

Correcting the Occlusal Contacts

Correction of occlusal contacts must not be initiated until the removable partial denture can be completely and comfortably seated in the patient's mouth. Attempting to correct occlusal errors before establishing adequate fit of the denture base is inappropriate. Faulty occlusion can produce severe tissue reaction like excessive ridge resorption, damage to the temporomandibular joint.

The criteria to be followed before adjusting occlusion:

- ❖ It is best to consider one arch as an intact arch so that the other one can be adjusted according to the intact arch.
- ❖ If one partial denture is tooth supported and the other tissue supported, the tooth-supported arch is first adjusted and is considered as the intact arch for adjustment of the tissue supported denture.
- ❖ If both partial dentures are entirely tooth borne, the one occluding with the most natural teeth is adjusted first, and considered as the intact arch.
- ❖ If both dentures are tissue supported, the final adjustment of occlusion on opposing tissue-supported base is usually done on the mandibular denture, since this is the moving member. Hence, even if the mandibular denture opposes more natural teeth and is considered as the intact arch, the final occlusal adjustments are made only on it.

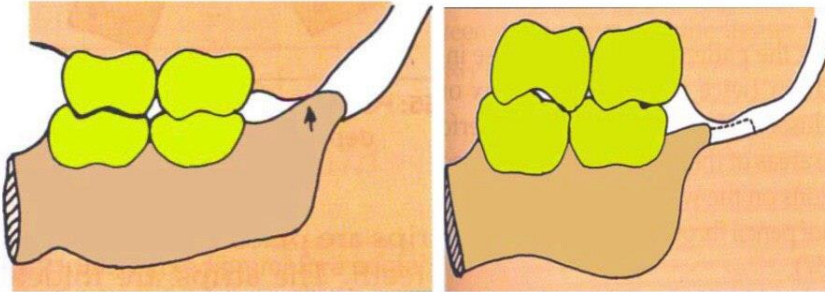
One should have a clear idea about the source of occlusal interference before treating such conditions. Sources for occlusal interference include:

1. Denture extension.
2. Occlusal Interference from Denture Framework.
3. Contact between the natural and artificial teeth (occlusion).

Denture extension

The posterior extension of the mandibular partial denture should be examined for interference with maxillary posterior teeth or the tuberosity. In such cases, the acrylic resin of the maxillary denture base should be reduced first without thinning or weakening the structure. If the interference still exists, the

mandibular flange should be adjusted and shortened till there is no interference during excursive movements



Occlusal Interference from Denture Framework

Any occlusal interference from occlusal rests and other parts of the denture framework should have been eliminated before or during the establishment of occlusal relations. The denture framework should have been tried in the mouth before a final jaw relation is established, and any such interference should have been detected and eliminated. Much of this need not occur if mouth preparations and the design of the removable partial denture framework are carried out with a specific treatment plan in mind.

In any event, occlusal interference from the framework should not ordinarily require further adjustment at the time the finished denture is initially placed. For the dentist to have sent an impression or casts of the patient's mouth to the laboratory and to receive a finished removable partial denture prosthesis without having tried the cast framework in the mouth is a dereliction of responsibility to the patient and the profession.

Contact between the natural and artificial teeth (occlusion).

The goals of occlusal evaluation and correction during the insertion appointment are:

- (1) Maintenance of existing natural tooth contacts.
- (2) Establishment of occlusal harmony in all centric and eccentric positions.

Failure to achieve these goals may result in the patient's inability to wear a new removable partial denture.

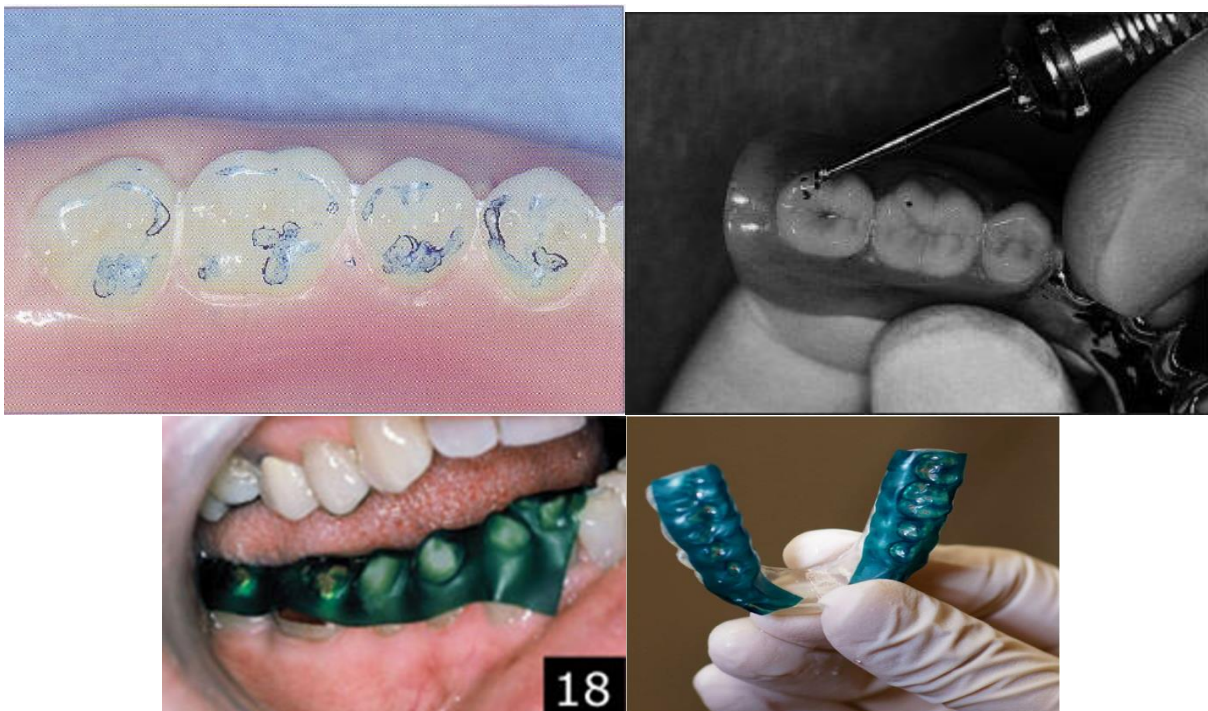
From a practical standpoint, the clinical techniques used to evaluate occlusal errors may be classified as either intraoral or extraoral procedures. The choice of procedure is primarily determined by the stability and support of the removable partial denture in the patient's mouth. A fairly large percentage of new removable partial dentures may be evaluated using an intraoral approach. However, for those patients in whom denture stability and support are compromised, use of the extraoral (or remount) procedure is most appropriate. The remount procedure includes patients with:

- (1) Removable partial dentures displaying long extension bases.
- (2) Extension base removable partial dentures covering extremely mobile soft tissues.
- (3) Removable partial dentures opposed by conventional complete dentures.

Intraoral procedure:

It basically involves using, either an articulating paper or occlusal indicator wax to check for the interferences:

1. Occlusal indicator wax or two strips of 28- gauge soft green wax (casting wax) is placed between opposing dentition.
2. The strips are folded in the center to form a V-shaped structure. The V-shaped band of wax is now placed in-between the teeth and the patient is guided to close in centric occlusion two or three times.
3. The wax is removed and inspected under transillumination for perforations.
4. All perforated areas are either premature contacts or excessive contacts.
5. Articulation ribbon may be used to mark the excessive contacts in occlusion.
6. The excessive contacts can also be identified by using the wax record as reference and relieved accordingly.



Extraoral procedure (remount procedures):

Extraoral correction represents an alternative to intraoral procedures. When using the extraoral technique, the removable restoration or restorations are mounted on a dental articulator using a facebow transfer and interocclusal records. Occlusal contacts are then marked, evaluated, and adjusted in the dry, well-illuminated environment of the dental laboratory.

An irreversible hydrocolloid impression is made with the removable partial denture completely seated in the patient's mouth. In most instances, the prosthesis will remain in the impression when the impression is removed from the mouth. If the prosthesis remains in the mouth, it must be retrieved and carefully repositioned in the impression. Dental stone is mixed and vibrated into the impression. When the dental stone has hardened, the cast is recovered and trimmed in preparation for mounting procedures. A cast of the opposing dentition must also be fabricated. If the opposing arch is restored with a conventional complete denture, the denture itself may be remounted on the articulator. If this is not the case, an alginate impression of the arch is made and a cast is generated.

At this stage of the procedure, the maxillary cast is mounted on the articulator using a facebow record. The mandibular cast is mounted using jaw relation records. Occlusal evaluation and correction procedures are initiated. The techniques and goals used in extraoral correction procedures are similar to those described for the intraoral method. The adjustment of denture teeth is continued until simultaneous contact of opposing occlusal surfaces has been achieved. In turn, eccentric occlusion is adjusted. After the occlusion of the removable partial denture has been refined on the articulator, appropriate occlusal anatomy is restored using fine burs and a low-speed handpiece.



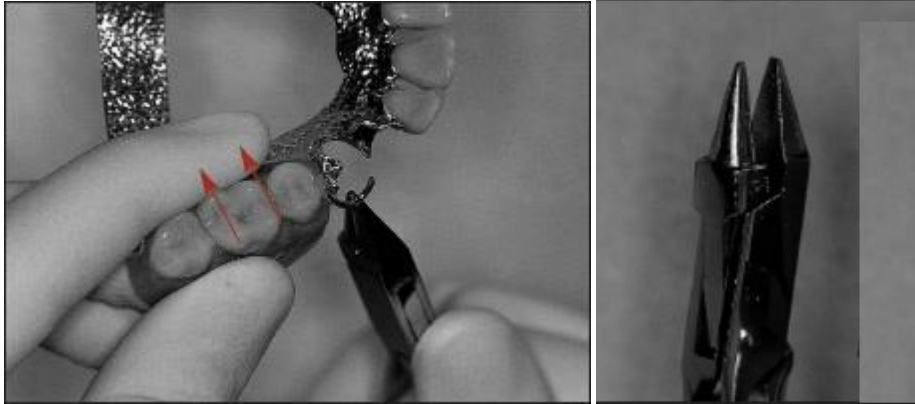
Adjusting Retentive Clasps

Retention provided by clasps should be just adequate to maintain the denture in position and should not exert undesirable forces on the abutment. After all the other corrections are completed, the clasps are adjusted finally.

Wrought wire clasps are adjusted to increase contact with tooth. Plier No.139 is used for this purpose which is a tapered cylindrical beak is opposed by flat surface of a triangular beak. The round beak of plier is placed on inner aspect of clasp at point marked where adjustment is needed. Denture is rotated with opposite hand towards round beak of pliers. Small adjustments are made at a time and denture is returned to mouth for observation and process is repeated until complete contact between tooth and clasp has been reestablished.

Cast circumferential clasps are adjusted in one plane only inward perpendicular to the flat surface of clasp or in the opposite direction. Technique is similar to that for wrought wire clasp and same pliers are used.

Vertical projection clasps can be adjusted inward or outward perpendicular to flat side of approach arm. Procedure is again similar to the above two clasps and the same pliers are used



Instructions To The Patient And Follow-Up Services

The placement and removal of the prosthesis

Instructions to the patient:

1. The patient should be advised that some discomfort that may be experienced initially.
2. The patient should be advised of the possibility of soreness developing despite every attempt on the part of the dentist to prevent its occurrences.
3. Discuss the problem of speech with the patient in regard to the new dentures.
4. The possibility of gagging or the tongue's reaction to a foreign object.
5. The mouth & the denture should be cleaned after eating & before retiring, by brushing with a small stiff-bristle brush.
6. The tissues should be allowed to rest by removing the denture at night.
7. The denture should be placed in a container & covered with water to prevent its dehydration.

Written instructions

It is impractical to expect that patients will remember all of the instructions provided at the insertion appointment. Providing the patient with written instructions will permit the patient an opportunity to review the instructions at home.

Follow-up services

The patient with a removable partial denture should not be dismissed as completed without at least one subsequent appointment for evaluation of the response of oral structures to the restorations and minor adjustment if needed.

This should be made at an interval of 24 hours after initial placement of the denture.

The patient should be advised that maximal service may be expected from the removable partial denture if the following rules are observed:

1. Avoid careless handling of the denture, which may lead to distortion or breakage.
2. Protect teeth from caries with proper oral hygiene, proper diet, and frequent dental care.
3. Prevent periodontal damage to the abutment teeth by maintaining tissue support of any distal extension bases.
4. Accept removable partial denture treatment as something that cannot be considered permanent, but partial dentures must receive regular and continuous care by both the patient and the dentist.