

The framework try-in

Since the goal is to maximize soft tissue support while using the teeth to their supportive advantage, the framework fitted to the teeth while soft tissue support is registered provides a means of coordinating both. This means that before the trays are attached, the framework must be fitted in the mouth.

If the master cast is an exact likeness of the mouth, then every metal casting which has been fitted to the master cast accurately, can be seated to its resting position in the mouth. However, when long delays occur between the time of impression making and the framework try-in minor tooth movements may occurred and the teeth may resist the free placement of the frame work, in accurate master casts, and defective casting, also produce impediments to the seating produce, laboratory errors in the framework.

No artificial teeth, trays or denture base should be added to the metal until the casting is adjusted and physiologically relieved.

Prior to patients appointment, the frame work should be removed from the master cast and evaluated for:

1. Nodules inside the clasps.
2. Nodules inside the guide planes.
3. Nodules inside the minor connectors.
4. Sharp edges which may lacerate the oral mucosa.
5. Roughness of metal from block out procedure.
6. Proper polish to tissue surfaces.

Nodules should be removed with stone burs, these areas then be smoothed with rubber disks & cones, after that check the master cast for signs of abrasion from injudicious seating of the framework. During the initial seating or insertion in patient mouth, do not use excessive force to seat the framework immediately. Gradual seating and searching for interferences, it should expected minor positional changes of the abutments have occurred.

Materials which can be used to detect interferences to seating are:

1. Pressure indicating paste (PIP).
2. Disclosing wax or Kerr's impression wax.

Remove internal interferences until the frame work is fully seated into the rest preparations. After the metal framework is fully seated into the rest preparations, are placed in the mouth & checked for occlusal equilibrium by using articulating paper. When both maxillary & mandibular restorations are being constructed they should first be inserted & equilibrated independently. Then both framework are placed in the mouth & checked to insure occlusal harmony with each other.

The metal frame work requirements:

1. The frame work must confirm to the original design.
2. The frame work must fit the master cast, if the fit is unsatisfactory on the cast it will also be unsatisfactory in the mouth.
3. All components which are designed to be clear of the gingival margin area should be checked to insure that the clearance is adequate.
4. In the mouth, these aspects should be checked again, remembering that the likelihood of some instability in free end saddle cases may be due to spacing beneath the mesh retention.
5. The occlusion is examined to ensure that there are no premature contacts caused by supporting units. This should be done by visual examination, from comments by the patient & with the use of articulating paper or disclosing wax. Any premature contact should normally remove at this stage, & if slight, can be adjusted at the delivery stage.

In general fitting the framework involves the following steps:

1. Use of disclosing media to identify interferences to completely seating the removable partial denture framework.
2. Use of disclosing media to identify the appropriate contact(s) of the component parts of the framework during seating of the framework and when the framework is completely seated in its designated terminal position.
3. Adjusting the seated framework to the opposing occlusion.

If there are opposing frameworks, the maxillary framework is removed from the mouth and the mandibular framework is adjusted to the natural maxillary dentition; then the maxillary framework is replaced and it is adjusted to the mandibular dentition with its framework in place. It is important to remember that the metal frameworks must allow all of the natural dentition to maintain the same designed contact relationship with the opposing arch as when the frameworks are out of the mouth. After the framework has been fitted and the custom trays have been attached, selective tissue placement impression and cast formation can be accomplished.



The framework must be evaluated to assure complete seating, full contact with the remaining dentition for stabilization, support, and retention as planned, and to allow full natural tooth contact. Several types of disclosing media may be used, such as stencil correction fluid, rouge, chloroform, and disclosing fluids, pastes, and waxes.

The altered cast technique

- The altered cast method of impression making is most commonly used for the mandibular distal extension partially edentulous arch (Kennedy Class I and Class II arch forms).
- Altered cast impression methods are seldom used in the maxillary arch because of the nature of the masticatory mucosa and the amount of firm palatal tissue present to provide soft tissue support.

The altered cast method allows for the different compressibility of different parts of the mucosa, and ensure that an even pressure is applied everywhere when force is applied.

- An impression of the saddle area is taken while it is under light pressure. The stiff bits of mucosa (e.g. over the ridge) will be hardly deformed at all, but the fatty soft bits (e.g. the bear shaped pad) will be squeezed flatter and flatter until they offer the same resistance as the stiff bits.
- Cast PD made using the altered cast impression method helps create an environment in which the teeth & the edentulous tissue support the base as compatibly as possible. The result is a potentially more stable RPD that improves the support for the occlusal relationship of the opposing dentition and the RPD restoration.
- However, this technique has the potential benefits of reducing the number of post-operative visits, preserving the residual ridges, improving stress distribution, decreasing food impaction and decreasing the torqueing of abutment teeth. All of which lead to increased patient satisfaction.

Purposes of altered cast technique:

1. Impression is used to modify master cast.
2. More accurate relationship between abutments and ridge.
3. Equalize stress between ridge and abutments.
4. Correct peripheral adaptation.

- The amount of pressure exerted by the mucocompressive impression is not under measurable control to suit each patient's individual need. It is very difficult to tell whether pain is being caused by the fitting surface or the occlusion. If the pain is localized, it is usually the fitting surface, but it could be due to rotational movement of the saddle (i.e. occlusion).

The Technique:

- In this technique the master cast is made first using anatomical impression technique.
- The framework has been tried in the mouth and fits the mouth and master cast as planned.
- The outline of acrylic-resin trays is penciled on the cast.
- One thickness of baseplate wax is adapted to outlines to act as spacers so that room for the impression material exists in the finished trays.
- The framework is warmed and pressed to position on the relieved master cast.
- All regions of the cast that will be contacted by autopolymerizing acrylic-resin dough are painted with separating medium.
- Acrylic-resin material is adapted to the cast and over the framework with finger pressure. Excess material over the borders of the cast is removed with a sharp knife while the material is still soft.
- Cured acrylic-resin trays and framework are removed from the cast, and trays are trimmed to outline the wax spacer.
- Borders of the trays will be adjusted to extend 2 mm short of the tissue reflections. Holes will be placed in the trays corresponding to the crest of the residual ridge and retromolar pads to allow escape of excess impression material when an impression is made.
- Then the edentulous area in the anatomical master cast is cut away with a saw. The cast is sliced using two cuts, one in the buccolingual & one anteroposterior.
- The buccolingual cut is made 1 mm behind the terminal abutment across the edentulous ridge.
- The anteroposterior cut is made 1mm lingual or medial to the lingual sulcus should be cut away along with the edentulous ridge.

- Vertical grooves are prepared on the cut walls of the cast.
- The frame work along with the functional impression is placed over the cut anatomical master cast. Since the edentulous area is cut away from the cast, edentulous area of the impression will be projecting in free space.
- The framework is sealed to the master cast using softened modeling plastic.
- The cast inverted along with the framework.
- The impression is beaded and boxed in continuity with the cast.
- The cast is soaked in slurry water for 10min. before pouring.
- A stone is poured into the boxing.
- The resulting master cast will have an altered ridge contour obtained from the functional impression.



Jaw relationships for removable partial dentures (R.P.Ds).

The fourth phase in the treatment of patients with removable partial dentures is the establishment of a functional and harmonious occlusion. Occlusal harmony between RPD and the remaining natural teeth is a major factor in the preservation of the health of their surrounding structures.

In removable partial dentures, occlusal stresses can be transmitted directly to the abutment teeth and other supporting structures because of the attachment of the RPD to the abutment teeth.

Failure to provide and maintain adequate occlusion on the RPD is primarily a result of:

- (1) Lack of support for the denture base.
- (2) Failure of establishing occlusion to a single static jaw relation record.
- (3) An unacceptable occlusal plane.

In establishing occlusion on a removable partial denture, the influence of the remaining natural teeth is usually such that the occlusal forms of the teeth on the removable partial denture must be made to conform to an already established occlusal pattern.

Objective in partial denture occlusion is harmony between natural and artificial dentition. Stable RPD will cause fewer undesirable changes in its supporting structures. Occlusion is one of the most important factors in developing a stable RPD.

Establishment of a satisfactory occlusion for the RPD patient should include (Steps to establish a satisfactory occlusion in RPD)

- (1) Analysis of the existing occlusion.
- (2) Correction of existing occlusal disharmony.
- (3) Recording of centric relation or an adjusted centric occlusion.
- (4) Harmonizing of eccentric jaw movements for a functional eccentric occlusion.
- (5) Correction of occlusal discrepancies created during processing of the RPD.

Desirable Occlusal Contact Relationships for Removable Partial Dentures:

The following occlusal arrangements are recommended to develop a harmonious occlusal relationship among removable partial dentures and to enhance stability of the RPD:

1. Simultaneous bilateral contacts of opposing posterior teeth must occur in centric occlusion.
2. Occlusion for tooth-supported removable partial dentures may be arranged similarly to the occlusion seen in a harmonious natural dentition, because stability of such RPD results from the effects of direct retainers at both ends of the denture base.
3. Bilateral balanced occlusion in eccentric positions should be formulated when a maxillary complete denture opposes the RPD. This is accomplished primarily to promote the stability of the complete denture. However, simultaneous contacts in a protrusive relationship do not receive priority over appearance, phonetics, and/or a favorable occlusal plane.
4. Working side contacts should be obtained for the mandibular distal extension denture. These contacts should occur simultaneously with working side contacts of the natural teeth to distribute the stress over the greatest possible area. Masticatory function of the denture is improved by such an arrangement.
5. Simultaneous working and balancing contacts should be formulated for the maxillary bilateral distal extension RPD whenever possible. Such an arrangement will compensate in part for the unfavorable position the maxillary artificial teeth must occupy in relation to the residual ridge, which is usually lateral to the crest of the ridge.
6. Only working contacts need to be formulated for the maxillary or mandibular unilateral distal extension RPD. Balancing side contacts would not enhance the stability of the denture because it is entirely tooth supported by the framework on the balancing side.
7. In the Kennedy Class IV RPD configuration, contact of opposing anterior teeth in the planned intercuspal position is desired to prevent continuous eruption of the opposing natural incisors, unless they are otherwise prevented from extrusion by means of a lingual plate or auxiliary bar, or by splinting. Contact of the opposing anterior teeth in eccentric positions can be developed to enhance incisive function but should be arranged to permit balanced occlusion without excursive interferences.

8. Balanced contact of opposing posterior teeth in a straightforward protrusive relationship & functional excursive positions is desired only when an opposing complete denture or bilateral distal extension maxillary RPD is placed.

9. Artificial posterior teeth should not be arranged farther distally than the beginning of a sharp upward incline of the mandibular residual ridge or over the retromolar pad. To do so would have the effect of shunting the denture anteriorly.

-A harmonious relationship of opposing occlusal and incisal surfaces alone is not adequate to ensure stability of distal extension RPD. In addition, the relationship of the teeth to the residual ridges must be considered.

-Bilateral eccentric contact of the mandibular distal extension RPD does not need to be formulated to stabilize the denture. The buccal cusps, however, must be favorably placed to direct stress toward the buccal shelf, which is the primary support area in the mandibular arch.

In such positions, the denture is not subjected to excessive tilting forces.

1. In a cl.III RPD where the natural dentition will guide the occlusion and make contacts in Maximum Intercuspatation, in this case we need only working side contacts.

2. Cl.I & CL.II RPD's with only few posterior teeth are missing and we still have some posterior teeth that guide the mandible into centric and eccentric movements, should have centric occlusion relation contacts only.

3. Cl.I & CL.II RPD's without no natural teeth guidance (very few or no posterior teeth at all) should have centric, working and balancing contacts.

4. Cl.I & CL.II RPD's which oppose a CD should have centric relation (CR), working balancing contact within the functional range, (balanced occlusion).

5. In the Class IV RPD : contact of opposing anterior teeth in the planned intercuspal position is desirable to prevent a continuous eruption of the opposing natural incisors.

Occlusion in RPD (requirements):

1. Whatever is the treatment of choice, it must be capable of function within the pattern of the patient's own functional requirements.
2. The combined occlusal patterns of natural & artificial teeth must be adjusted to function harmonically with other parts of the masticatory system.
3. When posterior teeth of one jaw are brought into contact with their antagonist in centric occlusion, they should touch simultaneously with no deflective occlusal contacts.
4. Opposing, contacting teeth should glide freely & without cuspal interference throughout the functional range of occlusal movement.
5. Attempts to create artificial occlusal surfaces should be preceded by the elimination of any occlusal discrepancies in the natural teeth.
6. Artificial posterior teeth should be small buccolingually than the natural teeth which they replace.
7. Artificial teeth should be arranged so the tongue will not be inhibited nor will the shape of the palatal vault be substantially altered.
8. An Important decision which must be made prior to the construction of the restorations, this decision is whether this restoration should be constructed in centric relation or in maximum intercuspation.

Methods for Establishing Occlusal Relationships:

It often is desirable to make the interocclusal relation record before the fabrication of the RPD framework. Doing so will allow the laboratory technicians to fabricate and adjust the framework properly before returning it to the clinician. This process should minimize clinical adjustments to the framework.

Five methods of establishing interocclusal relations for RPD, vary from the simple apposition of opposing casts (by occluding sufficient remaining natural teeth) to the recording of jaw relations in the same manner as for a completely edentulous patient.

The horizontal jaw relation (planned intercuspal position or centric relation) in which the restoration is to be fabricated should have been determined during diagnosis and treatment planning. The methods are:

1. Direct Apposition of cast:

Opposing casts may be occluded by hand. The occluded casts should be held in apposition with rigid supports attached with sticky wax to the bases of the casts until they are securely mounted in the articulator. Occlusal analysis and the correction of any existing occlusal disharmony should precede the acceptance of such a jaw relation record.



2. Interocclusal Records With Posterior Teeth Remaining:

Indications: is used when sufficient natural teeth remain to support the RPD (Kennedy Class III or IV) but the relation of opposing natural teeth does not permit the occluding of casts by hand. In such situations, jaw relations must be established as for fixed restorations with some type of interocclusal record.

The least accurate of these methods is the interocclusal wax record. A wax record can be further corrected with a freely flowing occlusal registration material. A uniformly softened, metal-reinforced wafer of baseplate or set-up wax is placed between the teeth, and the patient is guided to close in centric relation. The wax then is removed and immediately chilled thoroughly in room-temperature water. It should be replaced again to correct the distortion that results from chilling and then again chilled after removal. Any excess wax is removed. In these cases a contact between U & L natural teeth occurs at acceptable vertical dimension.

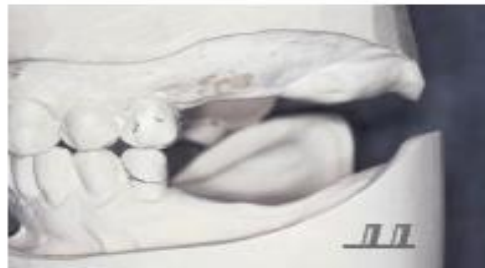


3. Occlusal Relations Using Occlusion Rims on Record Bases:

Indications:

- 1) When one or more distal extension areas are present.
- 2) When a tooth-supported edentulous space is large.

In these instances, occlusal rims on accurate jaw relation record bases must be used where the occlusal surface of a rim opposes standing teeth, a layer of modeling wax approximately 2mm depth is added to occlusal surface of the rim. And the wax is thoroughly softened by using a hot wax knife. The rim is seated in the mouth and the mandible is closed until maximal intercuspatal contact for natural teeth occurs.

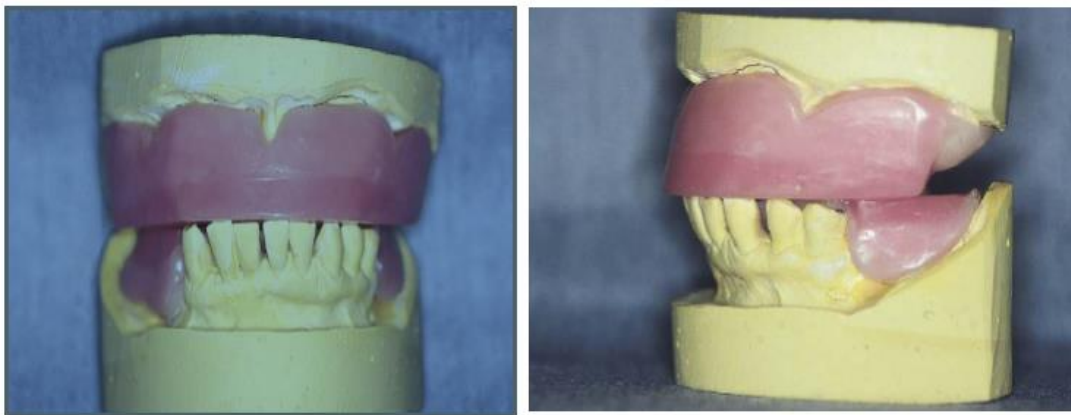


4. Jaw relations records made entirely on occlusion rims:

Indications:

1. When a maxillary CD is opposed by a mandibular RPD or the opposite.
2. Used in those rare situation in which the few remaining teeth do not occlude and will not influence eccentric jaw movements.
3. Only anterior teeth present.

The registration procedure used should be similar to the one used in CD work (a notch is cut in one rim surface & a cone of soft wax is placed on the other). The use of face bow, articulator or eccentric records are optional according to the training, ability, and dentist decision.



5. Establishing Occlusion by the Recording of Occlusal Pathways

The fifth method of establishing occlusion on the RPD is the registration of occlusal pathways and the use of an occluding template rather than a cast of the opposing arch.

- When a static jaw relation record is used, with or without eccentric articulatory movements, the prosthetically supplied teeth are arranged to occlude according to a specific concept of occlusion.
- A functional occlusal record is used, the teeth are modified to accept every recorded eccentric jaw movement.
- These movements are made more complicated by the influence of the remaining natural teeth.

Occlusal recording materials include:

1. Zinc oxide eugenol impression materials.
2. Plaster impression materials.
3. Modeling compound.
4. Polyether.
5. Polyvinyl siloxane.
6. Wax records made in edentulous areas with or without the support of record bases may not be sufficiently stable to be acceptable.

The interocclusal recording is most often made after fabrication of the RPD framework. Following the fitting of the framework and the making of a corrected cast impression if indicated (altered cast technique), the record base is fabricated on the edentulous areas of the framework/ master cast. Occlusion rims are added, and an occlusal recording material is used to make the record. The cast is oriented to the opposing cast with the recording, and desired denture teeth are selected. This fabrication is followed by a trial insertion appointment.

In Conclusion

- The occlusion must be evaluated before the prosthesis fabrication starts.
- Preprosthetic mouth preparation must be done for better occlusion reproduction.
- Proper method to be used for the record of correct occlusion.
- The imbalanced occlusion is the main cause of retention loss of the prosthesis.