Centric Occlusion (MIP)

The relationship of the mandible to the maxilla when the teeth are in maximum occlusal contact irrespective of the position or alignment of the condyle-disk assemblies. This is also known as the acquired position of the mandible or the maximum interocclusal position.

Centric Relation (CR)

The relationship of the mandible to the maxilla when the properly aligned condyle-disk assemblies are in the most superior position against the eminentia, irrespective of the tooth position or vertical dimension.

We must diagnosis and treatment plan the case before we may begin comprehensive care. Going in blind can just get us in trouble. Our teeth touch when we:

- Swallow
- Speak
- Parafunctional movement
  * Clenching
  * Bruxing

The force can be up to 10 times as great during sleep

The goal is to design occlusion that does not induce problems.

A thorough exam should always include a full mouth radiographic series, mounted study models using an ear bow and an intraoral exam. Questioning the patient about soreness and tightness will also be helpful. You will also need full periodontal charting, images of the teeth and full face/smile images and always joint images if completing a full mouth case.
Mounted models should include a wax bite of centric relation that can be achieved that day. **Centric Relation Du Jour. (CRdj)**

**The Repositioner Splint**
- To test the patient's response to a change in the occlusion.
- To determine if occlusal change will resolve TMD symptoms.
- To determine if the craniomandibular relationship can be stabilized.
- To allow comprehensive diagnosis and treatment planning.

**Rationale**

Relief of symptoms alone is not the major purpose or the end point of treatment with the repositioner splint in our mode of therapy as it is with many other approaches. The splint will relieve symptoms, but almost anything that is placed between the teeth to disengage the occlusion will relieve symptoms temporarily.

Occlusal therapy may be divided into three stages:
1. Symptomatic relief.
2. Transitional care – mandibular stabilization, diagnosis and treatment planning.

The foremost rational for making a repositioner splint is to provide an artificial functional occlusion that eliminates occlusal interferences, allows the joint to heal and allows the mandible to seek it's most stable position.

**Indications**
Splint therapy is indicated anytime that:

1. TMD symptoms are present.
2. Mandibular manipulation is difficult.
3. A patient is to be treated to the centric relation position (restorative, orthodontic or surgical treatment.)
In addition to a centric relation closure, the repositioner splint provides an anterior guidance ramp, which serves to disclude the posterior teeth during any movement out of centric. The anterior ramp is adjusted to the gentlest possible slope that will immediately disclude all posterior teeth. As many of the lower four incisors as possible should contact the ramp in straight protrusive. The cuspids should not contact at all during protrusive but should be the main guiding inclines (and should disclude the posterior teeth immediately) in lateral movements. The lower anterior teeth should only have .0005” clearance from the ramp in centric closure.

The repositioner should be adjusted when a change in mandibular position becomes evident. The adjustment is usually done by relining the occlusal surface of the splint with self-curing acrylic resin.

Three significant factors cause change in mandibular position during splint therapy:

- Relaxation of the muscles that posture the mandible. This tightness is often due to parafunctional habits or muscle spasms.

- Elimination of intracapsular inflammatory fluid.

- Repositioning, remodelling or recontouring of the bony and/or cartilaginous parts of the joints (condyles, disc or fossae).

The repositioner splint is a device that can be used to test the patient's response to a change in the occlusion without doing something irreversible.

Splint therapy, in symptomatic patients, must be continued full time until there has been no change in mandibular position and the patient is comfortable. This will take 3 months or more in most patients.

If comfort and stability cannot be achieved with the splint, there is no reason to believe that it can be obtained by altering the occlusion
permanently. If symptoms cannot be relieved or stability attained with the splint, we will not proceed with definitive treatment.

**Indirect Repositioner Splint Construction.**

- Upper and lower alginate impressions with good anatomical detail and no bubbles.
- Estimated fear bow and wax centric relation records.
- Mount upper model on the articulator with the ear bow and a split cast device.
- Mount lower using the wax bites. Less office adjustment will be needed if the wax bites are taken at the exact vertical. Do not allow the lab to move the pin unless necessary for clearance.
- Send mounted models to a lab asking for a superior repositioning appliance (CR).
- At delivery date, the splint should fit the maxillary arch with no movement. It should be adjusted as follows:
  * Simultaneous contact of all posterior teeth with the condyle seated as much as possible.
  * All anterior teeth have 5/10,000 inch clearance with the condyle seated.
  * In lateral movement, right and left cuspids will contact and separate all posterior teeth. No other anterior teeth should contact.
  * In protrusive, the lower incisors will function against the ramp to disclude all posterior teeth including the cuspids.

**The above should always be achieved by using the reline technique as shown in the presentation. Do not try to use marking paper and grind in the occlusion.** The will not work in most patients and will be frustrating to you. Just do not do it!

**TMD treatment**

- Symptomatic relief -
  Get patient out of pain
Wet heat (8 minutes heat – 1 minute cold – 2 minutes heat)
Both sides at the same time
Drugs (NSAID)
Night time splint therapy
Sleep on back

-Transitional care
  Full time splint therapy
  Diet changes (caffeine)
  Mandibular stabilization
  Diagnosis and treatment plan
-Definitive treatment
  Equilibration
  Restorative work
  Ortho or combined ortho with surgery

Replacement upper denture made easy –

Patient to present with their present upper denture.

Appointment 1. (60 minutes)
1. Soft tissue reline of the upper denture.
2. Occlusal reline with hard reline material on the occlusal surfaces.

Appointment 2-3. Continue to see patient until there is no slide in the occlusion and all is comfortable and stable. Fabricate a clear duplicate denture at one of these reline appointments.

You are now ready to start the most predictable denture procedure that you have ever preformed.

Appointment 1. (60 minutes.)
1. Remove any areas of interference on the tissue side of the duplicate denture. Hollow it out.
2. Border mold the duplicate denture for a passive fit intra-orally.
3. Mark the posterior border on the palate and confirm that your molding goes past this point.
4. Take final impression using the duplicate denture as the final impression tray. Have patient lightly bite to confirm position. Muscle trim as material is setting.
5. Mark on the face reference marks for vertical determination.
6. Remove upper impression and prepare the occlusal surface for an occlusal reline over the posterior teeth only.
7. Determine final measurement using the two marks placed on the shin and set ruler to this value.
8. Complete upper occlusal reline in hard reline material at the exact vertical value. This is very important.
9. Make any marking needed for the post dam, mid line and incisor length at this time using a black pen and some light cured composite.
10. Take ear bow record with the upper denture in place and set the I.P.L level with the reference bar on the ear bow.
11. Take a full face smile image with the upper impression denture in place.
12. Remove the impression denture, give the patient back his denture, confirm shade on new teeth and schedule the patient in 2 weeks for the final appointment.
13. Take lower impression.

Lab work (60 minutes.)
1. Box impression with alginate material and pour with split cast. Do not separate impression from stone. Pour up and separate lower impression.
2. Trim models, place ear bow on the articulator and prepare to mount upper model. Set Bennett elements @ 10-15 and the horizontal inclination @ 20-30.
3. Mount upper model on ear bow record.
4. Trim the occlusal reline of the upper model so that the lower cusp tips have a complete and stable seat into the reline material.
5. Mount the lower model to the upper model with the pin set to 0.
6. Using the full face smile image, set the cant of the desired smile and transfer using the smile guide or other.
7. Send to lab with all other needed information and process the final denture. Do not allow the lab to separate the processed model. Send to you first.

3 days before patient comes in. (10 minutes.)
1. Use occlusion spray and adjust the contacts and clearances of the final denture. Polish any areas on the teeth that you adjusted.
2. Send back to the lab for final processing.

Delivery day. (30 minutes.)
1. Wet final denture and place. Using firm pressure, completely seat the final denture.
2. Have the patient bite and move in lateral movements. This should be the best denture that this patient has ever had. Enjoy the rest of your day.

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**Centric Occlusion Restorative Procedures**

**Patient care**
1. Full mouth impressions with mandibular closed as much as possible.
2. Wax bite (Delar) only where clearance allows with patient biting completely together in centric occlusion.
3. Ear bow for the semi-adjustable articulator selected.
4. Record in chart all teeth that hold shim stock.
5. Fabricate a temporary with interproximal contacts and in occlusion.

**Laboratory care**
6. Pour solid upper and lower models in model stone. Use split cast for upper if you are not using magnetic mounting plates. Mix all model stone in vacuum mixer.
7. Carefully examine models and remove all bubbles in pit and fissure area.
8. Set up and mount upper model with ear bow and snow white #2 stone.
9. Try wax bite on both models and trim so no wax is contacting tissue.
10. Stabilize mandibular model and wax bite to maxillary model.
11. Check mounting with split cast. Remount if this does not check.
12. Using shim stock, check occlusal holding points. If it matches the interoral records, you are good to go. If not, mark with indicator spray and equilibrate until it matches. Be careful not to over equilibrate. If there is a question, less is better than more.
13. Send mounted models and articulator to lab with preparation impression.
14. When case returns, place restoration on die model and check margins.
15. Now place restoration on solid mounted model and check interproximal contacts and occlusion. All teeth that contact should match your intraoral records. If not adjust, polish and re-glaze if indicated.
16. You are ready for the easiest cementation procedure ever!
18. If metal restoration, cement with glass ionomer cement. If non-metal restoration, bond with resin cement.

Cementation. (Inlays, Onlays, Crowns & Bridges.) using Scothbond MP +

Very important test. – Mix your dual cured cement on a pad and now mix a small amount of the SBMP Catalyst and make sure it does not snap set. If so, follow #11 & #12 below exactly.
1. Remove temporary.
2. Place the rubber dam. Kavo scaler removes Duralon nicely.
3. Clean prep with chlorahexidine.
4. Try in and check margins, interproximal contacts and adjust.
5. Prepare restoration for adhesion. Refer to section 6 below.
6. Place Teflon tape to cover the adjacent teeth and protect from etch.
7. Etch with 30% -40% phos. acid. Split etch technique. 15 + seconds on enamel and 10 seconds on dentin. Wash off. Leave moist.
9. Place a thin layer of the Activator to the entire prep. Air thin 5 sec.
10. Place the dentin Primer using several layers. Allow to saturate for 15 seconds. Lightly air evaporate until movement of fluid stops. Light assist 20 s. Look for the shiny appearance.
11. Apply a thin layer of Catalyst to entire preparation only. Do not place Catalyst on restoration. Do not light cure!!!!
12. Mix and place dual cure composite cement in/on the restoration only.
13. Seat restoration and maintain pressure while cleaning as much of the cement as possible. Spot cure on the occlusal with 2mm light to tack down. Clean interproximally with explorer or superfloss.
14. Place glycerin over all margins prior to final cure.
15. Cure for 1 minute from each surface.
15. Remove the rubber dam, check occlusion, adjust and polish with polishing points. Open contacts with separating disc.
16. Isolate with cotton rolls and etch surface of resin restorations or margins of ceramic restorations for 10 seconds. Wash and dry well. Place the surface sealer, air thin and cure for 30 seconds.

Important additional noted to the above.
In my testings, All Bond 3 and OptiBond FL are also excellent choices for indirect adhesives. All Bond 3 is promoted as a dual cure material and OptiBond FL works great when using immediate dentinal seal and light may get to all areas of the prep interface.

Cementation for IDS technique.
All areas of the preparation restoration interface should be in areas that light may reach.
2. H3PO4 etching for 30 seconds. All dentin has already been sealed.
3. Dry very well.
4. Place filled adhesive. Do not cure.
5. Place warmed composite or dual cured cement with restoration and cure 60 seconds from every surface.

Jeff Brucia, DDS
1606 Stockton Street. #305
San Francisco, California, 94133
Office Phone
(415) 421-3645 Fax (415) 421-7353
FACE
(408) 252-4076 Fax (408) 252-2063 www.facedentistry.org