Centric Jaw Relation Record & Mounting

Accurate diagnostic casts transferred to a semiadjustable articulator are essential in planning fixed prosthodontic treatment.

This enables static and dynamic relationships of the teeth to be examined without interference from protective neuromuscular reflexes.

If the maxillary cast has been transferred with a facebow, a centric relation (CR) interocclusal record has been used for articulation of the mandibular cast, and the condylar elements have been appropriately set (such as with protrusive and/or excursive interocclusal records), reproducing the patient's movements with reasonable accuracy is possible. If the casts have been articulated in CR, assessing both the CR and the maximum intercuspation (MI) position is possible, because any slide can then be reproduced.

Other critical information not immediately apparent during the clinical examination includes the occlusocervical dimension of edentulous spaces. On an articulator, these are readily assessed in the occluded position and throughout the entire range of mandibular movement.

Relative alignment and angulations of proposed abutment teeth are easier to evaluate on casts than intraorally, as are many other subtle (delicate) changes in individual tooth position. Articulated diagnostic casts permit a detailed analysis of the occlusal plane and the occlusion, and diagnostic procedures can be performed for a better diagnosis and treatment plan.

Jaw relation record: is the registration of jaw relation in centeic or eccentric position.

Eccentric position: any position other than that which is a centric position.

Bite registration material: is the material used to transfer the jaw relation record from the patient mouth to the articulator in centric and/ or eccentric relationship.

Types of bite registration materials:

1.Ready made bite wax.

2.Base plate wax sheet.

3.Occlusal rim.

4.ZOE paste.

In case of simple die, no need for jaw relation record.

Centric relation record

A **centric relation record** (Fig. 2-15) provides the orientation of mandibular to maxillary teeth in CR in the terminal hinge position, in which opening and closing are purely rotational movements.

The CR record is transferred to the maxillary cast on the articulator and is used to relate the mandibular cast to the maxillary cast. Once the mandibular cast is attached to the articulator with mounting stone, the record is removed. The casts then occlude in precisely the CR position as long as the maxillary cast is correctly related to the hinge axis with a facebow.

Centric relation recording technique

Different techniques can be used to make a CR record. The choice of recording medium is, to some degree, a function of the casts to be articulated. For instance, very accurate casts made from elastomeric impression materials can be articulated with a high-accuracy interocclusal record material such as polyvinyl siloxane.

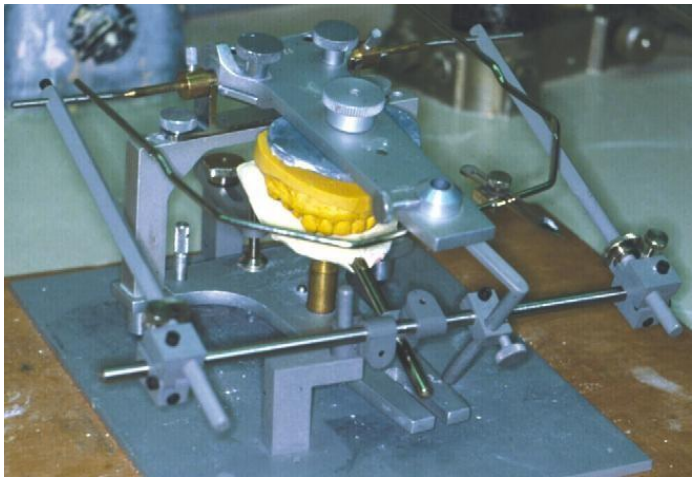
However, less accurate diagnostic casts poured from irreversible hydrocolloid are better articulated with the use of interocclusal wax, provided that the record is properly reinforced.

Articulating the diagnostic casts

Maxillary cast

Place the bite-fork support under the bite fork, leaving a small separation between the two. Put some fast-setting orthopedic plaster of a creamy consistency between them until it contacts both without lifting the bite-fork.

The purpose of this is to stabilize the bite fork from lowering by the weight of the upper cast and/or the expansion of the plaster used to mount it.



Kinematic facebow aligned on the articulator

The maxillary cast (Fig. 2-23) is seated in the indentations on the facebow fork after the facebow is attached to the articulator. Procedure of transferring the orientation jaw relation to the articulator is called face-bow transfer. Make retention grooves on the split cast of the upper cast. Check that the occlusal and incisal surfaces of the cast are free of excess plaster and irregularities.

*Close the upper frame of the articulator until the incisal pin touches the mounting fixture.

Check that the mounting plate does not touch the upper cast. If there is not enough space then trim the split cast in the lab.

*Reposition the cast on the bite fork. Determine how much mounting

plaster is needed to mount the cast.

*Mix mounting plaster until creamy (to avoid movement of the bite-fork) and put some on the mounting plate and on the split cast.

*Close the upper frame until both plasters, that are still soft are joined.

*Carefully remove any excess mounting plaster. Now wait. Do not touch the plaster until it has set completely (around 20 minutes).

Open the articulator and make sure the upper model is seated in the bitefork.

*If the model moves there was an error in the mounting and the upper cast must be removed from the mounting plate and repeat the entire procedure.

Once set, open the articulator, and remove the bite-fork assembly.

Mandibular cast

To relate the mandibular cast properly to the maxillary cast, the incisal guide pin should be lowered sufficiently to compensate for the thickness of the CR record. The articulator is inverted, and the record is seated on the maxillary cast. The mandibular cast (Fig. 2-24) is then carefully seated in the record, and each cast is checked for stability.

Place the centric relation interocclusal wax record on the teeth of maxillary cast. Be sure that the teeth seat completely into wax record.

Place the mandibular cast into interocclusal record.

There should be *no contact between the maxillary and mandibular cast.*

The maxillary and mandibular casts can be luted together with metal rods, or pieces of wooden tongue blade, and sticky wax. The mandibular member of the articulator is closed into mounting stone; the condylar balls should be fully seated in the corresponding fossae.

Otherwise, the articulator should be held until the stone has reached its initial set. No attempt should be made to smooth the stone until it has fully set.

Evaluation: Accuracy is crucial in both CR and maximum intercuspation. Before the articulator controls are adjusted, the accuracy of CR must be confirmed by comparing the tooth contacts on the casts with those in the mouth (Fig. 2-25). During the clinical examination, the position of tooth contacts in CR can be marked with thin articulating film. Normally, the markings are on the mesial inclines of maxillary cusps and the distal inclines of mandibular cusps.

Their exact location can be transferred by having the patient close through thin occlusal indicator wax. The articulated casts are closed, and the retruded tooth contacts marked with articulating film. When the indicator wax is transferred to the casts, the perforations should correspond exactly to these marks.

- ❖ Both casts are seated completely in the interocclusal wax record.
- ❖ Mounting stone is securely attached to both casts and mounting plates.

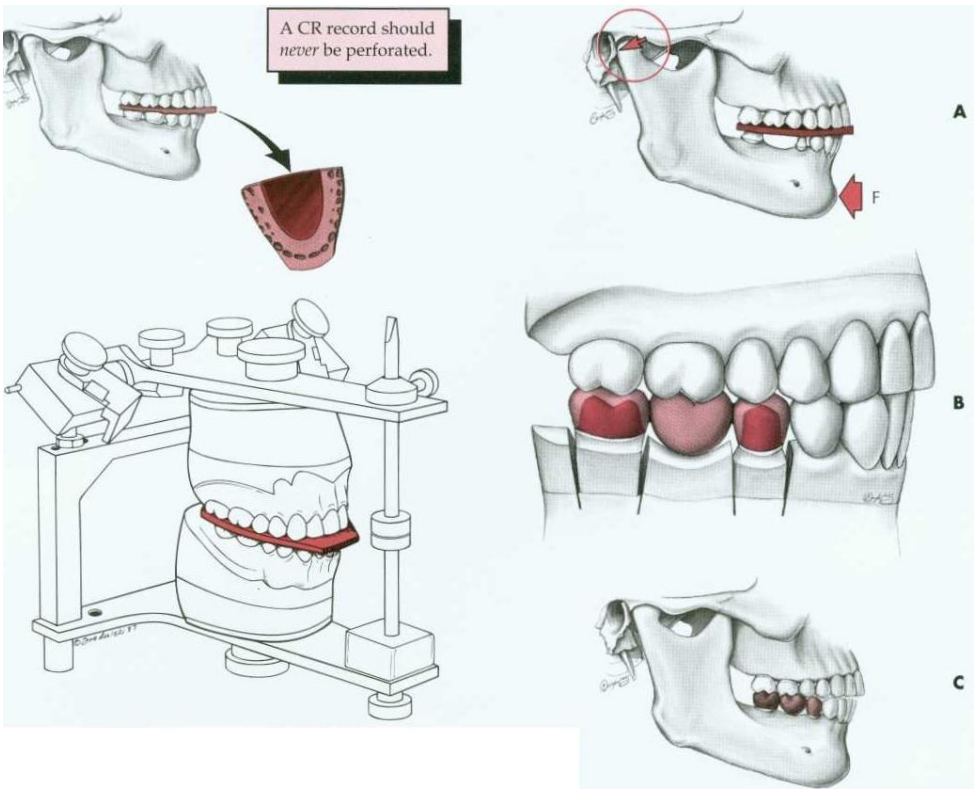


Fig. 2-15. A CR record transfers the tooth relationships at CR from the patient to the articulator.

Fig. 2-16. Incorrect CR recording. A, If the mandible is forced backward (F), the condyles will not be in their most superior position but will be moved backward and downward (arrow). B, Any restorations made on casts related with this CR record will be in supraclusion when tried in the mouth. C, Note the relationship of the anterior teeth

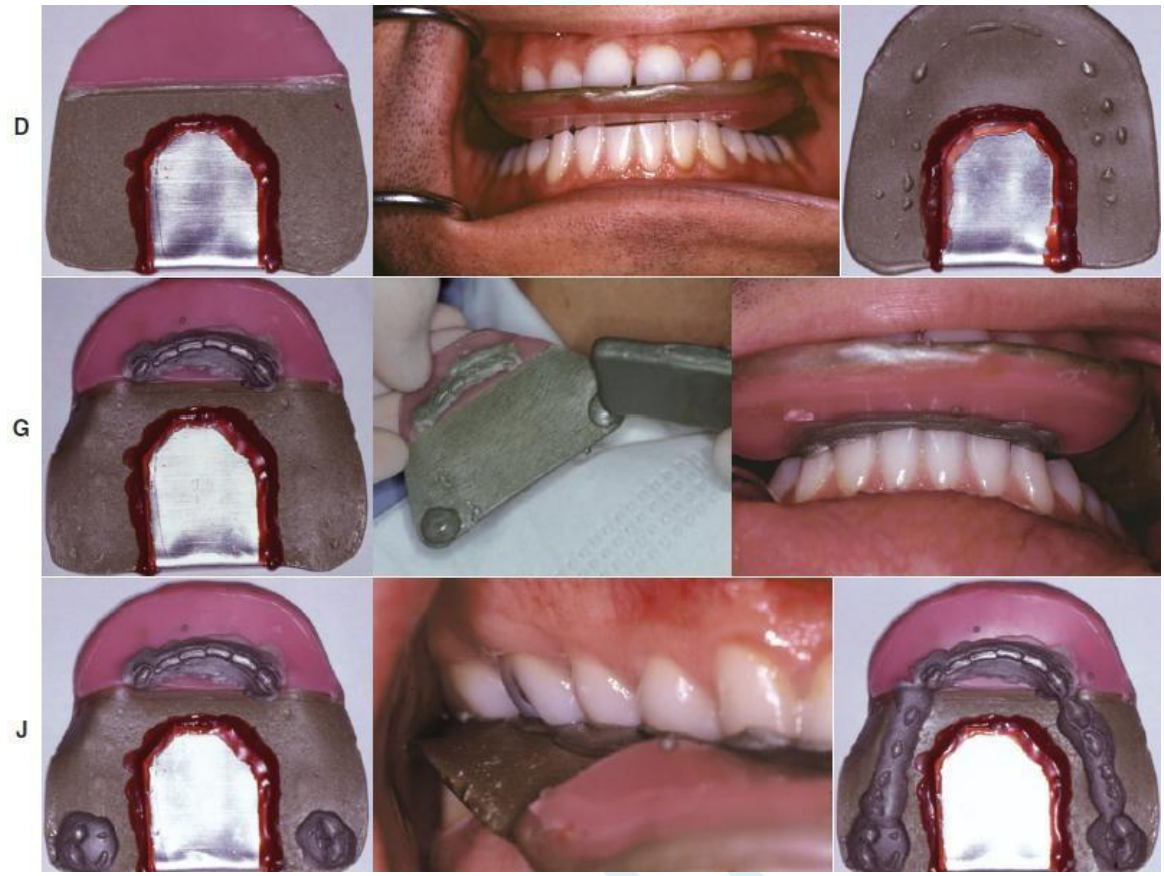


Fig. 2-19

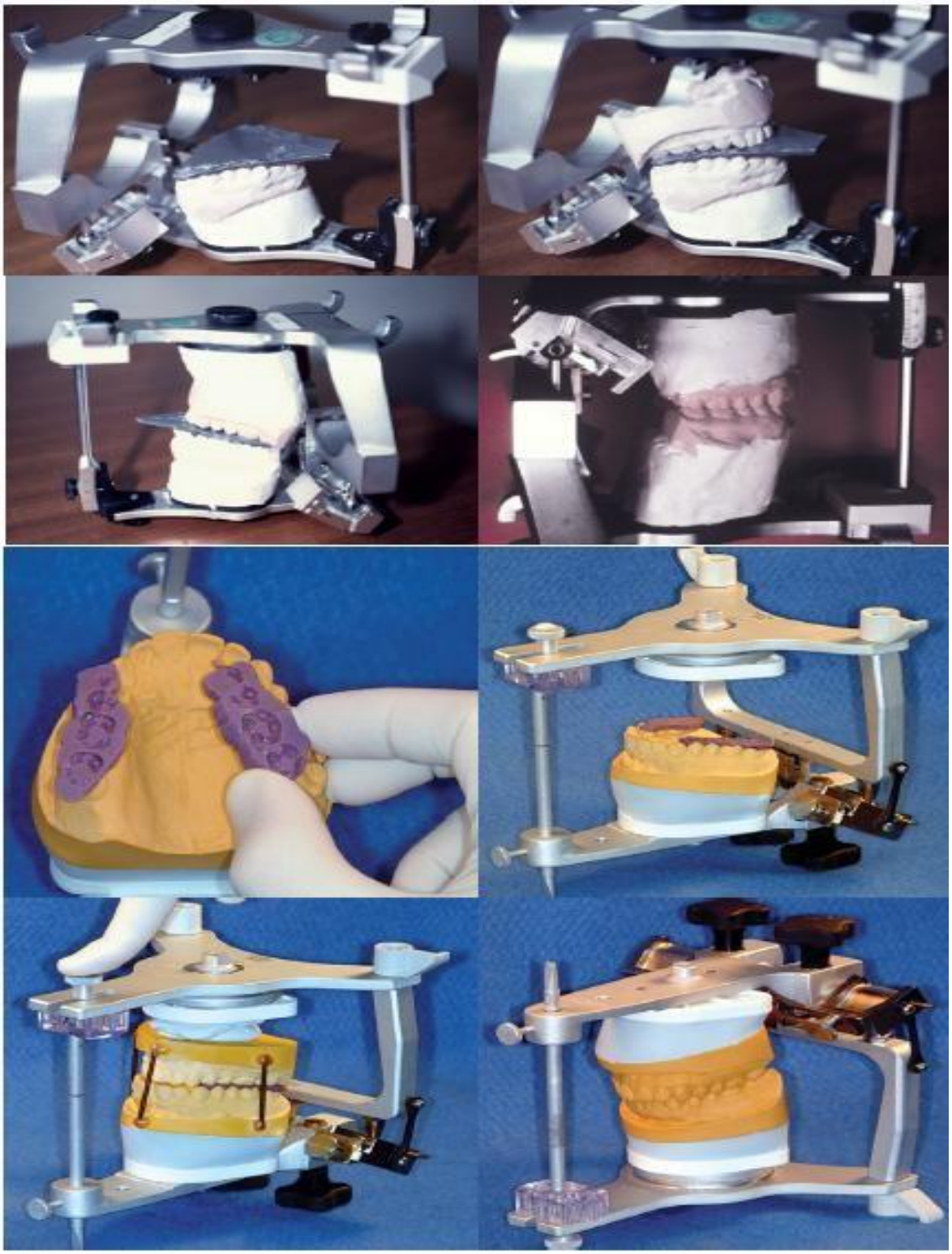
Centric relation (CR) recording technique. The reproducibility of the CR position is verified because CR has to be reproduced several times while the record is made. **A**, Armamentarium. **B**, A sheet of soft Aluwax is adapted to the maxillary arch. **C**, A piece of hard pink wax is added to the lower anterior portion of the wafer. **D**, Some Ash's Metal #7 is folded around the posterior border and luted to the wafer with sticky wax to increase rigidity. **E**, The reinforced sheet is repositioned and the mandible is guided into CR until the pink wax provides a stop for vertical closure. **F**, Note that the maxillary indentations capture only the cusp tips. Some Aluwax is added to the lower incisor indentations. The record is repositioned and the CR closure repeated. **G**, The incisor indentations are reproduced in the Aluwax. **H**, After additional wax is added to the area of the first molars, hinge closure is repeated (**I**). **J**, The molar indentations are clearly visible. The incisor indentations should have been reproduced. Any "double" indentation indicates inaccuracy. **K**, The CR closure is repeated one more time after additional Aluwax is added to the premolar regions. **L**, The completed CR record. *(Courtesy of Dr. J. N. Nelson.)*

Fig. 2-20

Centric relation (CR) recording. **A**, Elastomeric material for CR recording. **B**, Mandibular quadrants coated, the dentist is using an anterior resin jig (see Fig. 2-18) to ensure a reproducible recording position is obtained. The patient's mouth remains occluded until the material has set. **C**, The record before trimming.

Fig. 2-13

Mounting the maxillary cast on a Whip Mix articulator. **A**, Armamentarium. **B**, The incisal pin is removed. **C**, The condylar inclination is adjusted to the facebow setting. **D**, The side shift is set to zero. **E**, A mounting plate is attached. **F**, The facebow earpieces are attached to the condylar elements. **G**, Facebow is attached to the articulator. **H**, The scored maxillary cast is positioned on the facebow fork, and the cast is prewetted. **I**, Mounting stone is applied to the cast and the mounting plate. The upper member of the articulator is closed until it contacts the crossbar of the facebow. **J**, Additional stone is added as needed. *(Courtesy of Whip Mix Corporation, Louisville, Kentucky.)*



Mounting the mandibular cast. **A** to **D**, Denar articulator. **A**, The centric relation (CR) record is positioned on the inverted maxillary cast. **B**, The incisal guide pin is adjusted, and the mandibular cast is oriented in the record. **C**, The cast is attached with mounting stone. **D**, When the pin is raised, the casts contact in CR closure. **E** to **H**: Whip Mix articulator. **E**, Trimmed elastomeric CR records. **F**, CR records positioned on the inverted articulator. **G**, The incisal guide pin is adjusted, the cast is stabilized, and plaster is applied to the prewetted cast and the mandibular mounting plate before the articulator is closed. **H**, Completed mounting. (**E** to **H**, *Courtesy of Whip Mix Corporation, Louisville, Kentucky.*)