



* Neutral-Zone Registration

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*Introduction

*Patients who have been edentulous for an extended period generally exhibit decreased facial muscle tone and a large tongue size, thereby affecting the retention and the stability of their prostheses.

* The neutral zone concept is applied to the edentulous patient to facilitate stability of the removable prosthesis and decrease food entrapment into vestibular spaces.

* The “neutral zone” was first described by Dr. Wilfred Fish, who indicated that the denture’s polished surface should be contoured so that it approximates the moveable muscles of the lips, cheek, and tongue.

* In addition to simply replacing missing oral tissues, complete dentures serve to structurally redefine true spaces and potential spaces within the oral cavity.

* Regardless of the fabrication technique used, functionally inappropriate denture tooth arrangement or physiologically unacceptable denture base volume or contour have been implicated in poor prosthesis stability and retention, compromised phonetics, inadequate facial tissue support, inefficient tongue posture and function, and hyperactive gagging.

* Optimal facial-lingual arrangement of posterior denture teeth have varied dramatically over the profession's long history of complete denture therapy.

* As stated previously, the concept that posterior denture teeth should be arranged to occupy the position of their natural tooth predecessors has been put forward.

* Others have suggested that posterior denture teeth should be arranged directly over the crest of the edentulous ridge.

* In addition, Authors have published subtly varying concepts and philosophies for optimal facial-lingual arrangement of posterior denture teeth.

*Recording the Physiologic Neutral Zone for Edentulous Patients:

* Particular interest is the use of the neutral zone to guide posterior denture tooth arrangement and denture base contouring.

*** To define the neutral zone, consideration must be given to the potential denture space; that space in the edentulous mouth vacated by the natural dentition and dental supporting tissues and bounded by the tongue medially and the lips and cheeks laterally.**

* The neutral zone resides within this potential denture space.

* More specifically, the neutral zone is that region where forces imposed by the tongue directed outward are neutralized by inwardly directed forces originating from the cheeks and lips during normal neuromuscular function.

*** In general, boundary conditions that define the neutral zone are developed through muscular contraction and relaxation during the various functions of mastication, phonation, deglutition, and facial expression.**

*** To provide complete dentures that reside within the theoretically stabilizing boundary conditions of the neutral zone, careful attention must be given to the dynamic physiologic and functional nature of the edentulous oral cavity.**

*** Clinicians must understand, identify, induce, and record the neuromuscular dynamics of the functioning oral tissues using a single static registration.**

*** Once accomplished, this information can then be applied to the 3-D construction of the definitive prosthesis.**

* The procedure for registering the neutral zone comprises two steps.

***The first step is:**

* Performed during the maxillo-mandibular records appointment, which will guide the bucco-lingual positioning of the posterior prosthetic teeth.

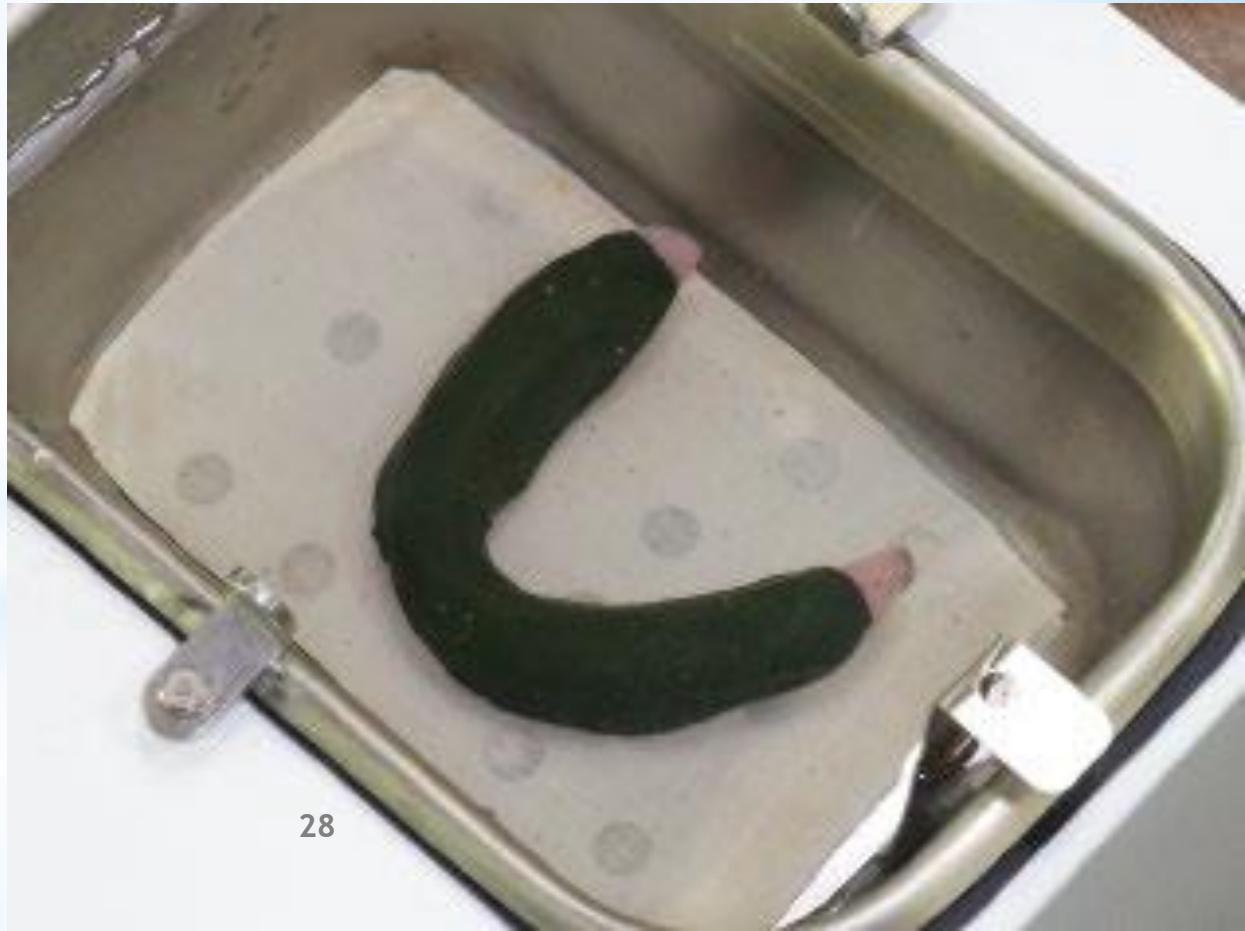
***the second step:**

* Is performed during the wax trial placement appointment, and aids in the development of the denture's polished surface.

* A modeling plastic impression compound occlusal rim should be fabricated prior to the record appointment to accomplish the procedure in a timely manner.

*Technique:

- * 1) The mandibular record base with the modeling plastic impression compound occlusal rim is immersed in a warm water bath set at a temperature of 140 °F.



- * 2) Once the modeling plastic impression compound is uniformly softened the mandibular record base with the occlusal rim is removed from the water bath and quickly placed in the patient's mouth.

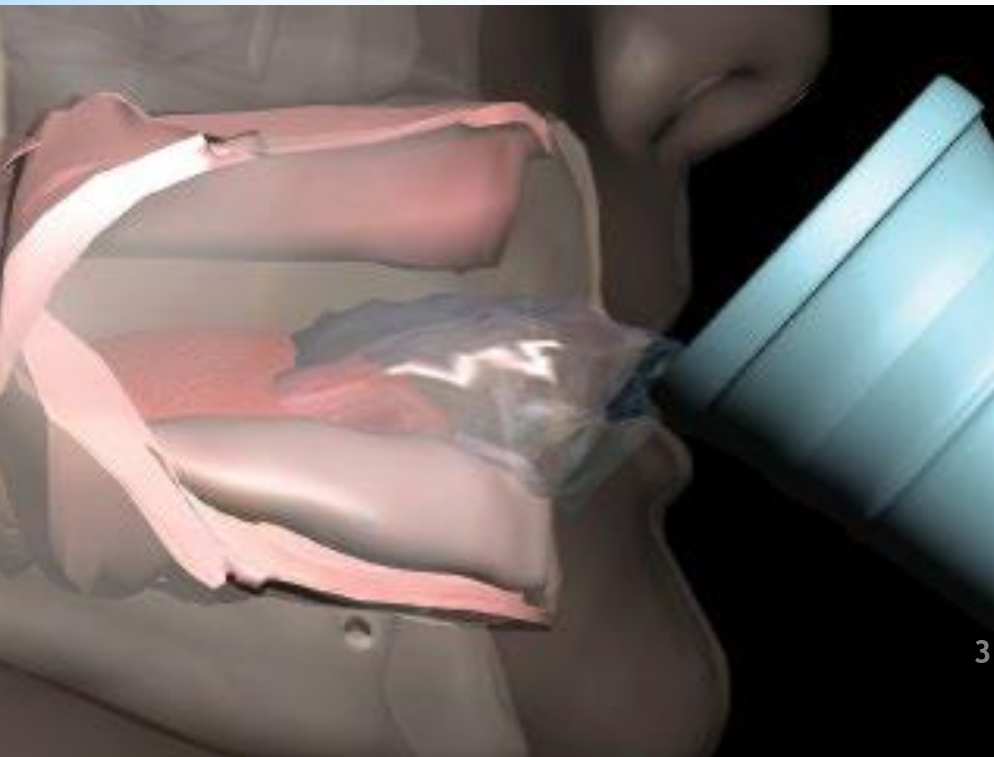


* A maxillary record base is not used for this procedure because eliminating the maxillary record base eliminates the compressive forces that may arise during the recording of the neutral zone.

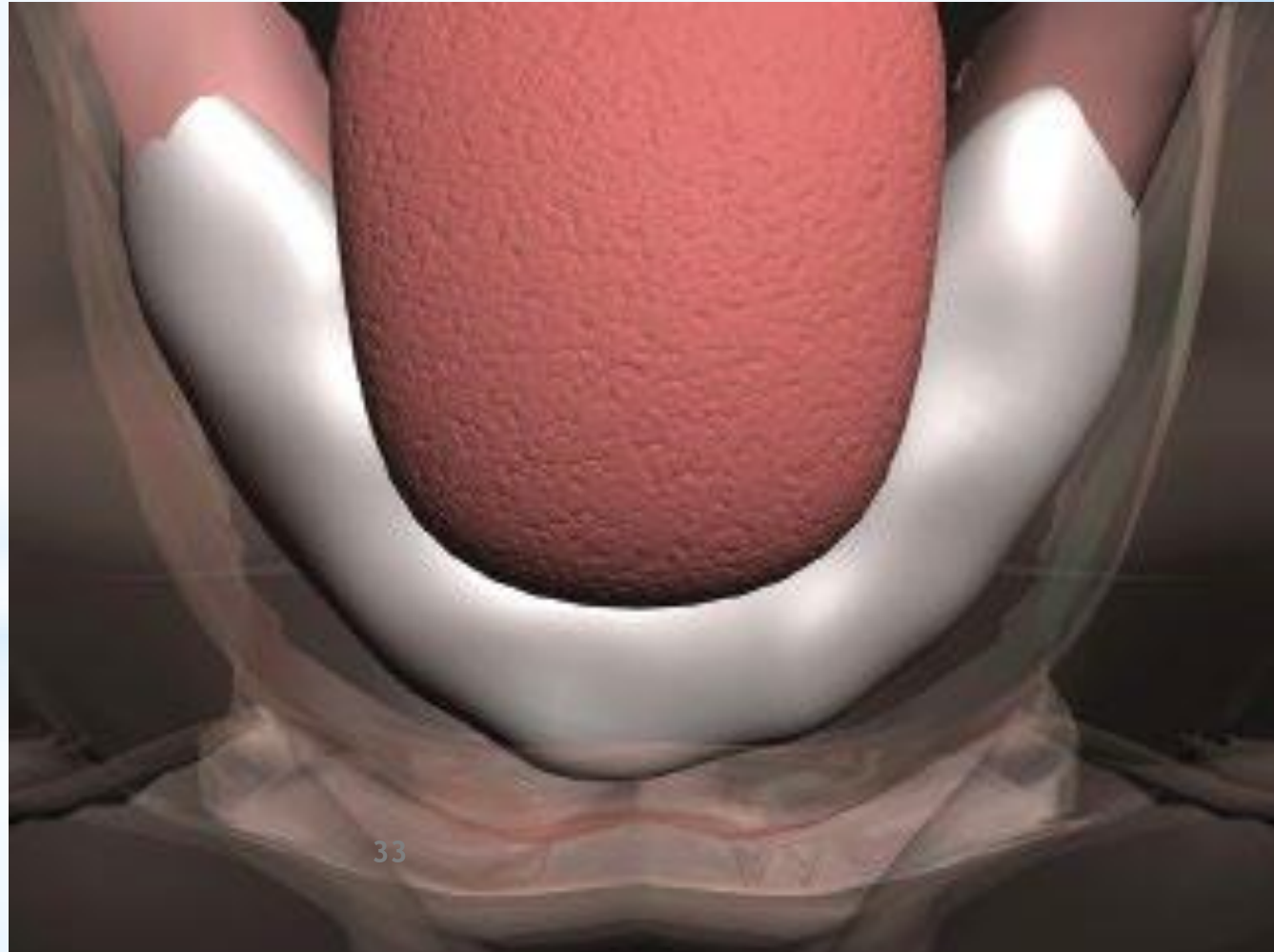
- * 3) The patient is given a cup of warm water and is asked to swallow, then sip warm water and swallow again.



- * 4) Sipping and swallowing procedures are repeated several times. The thermoplastic rim is molded through the action of muscles of cheeks and lips moving inward and the muscles of tongue moving outward.



* As the heated material cools and solidifies, the resulting volume of the modeling plastic impression compound defines the neutral zone.

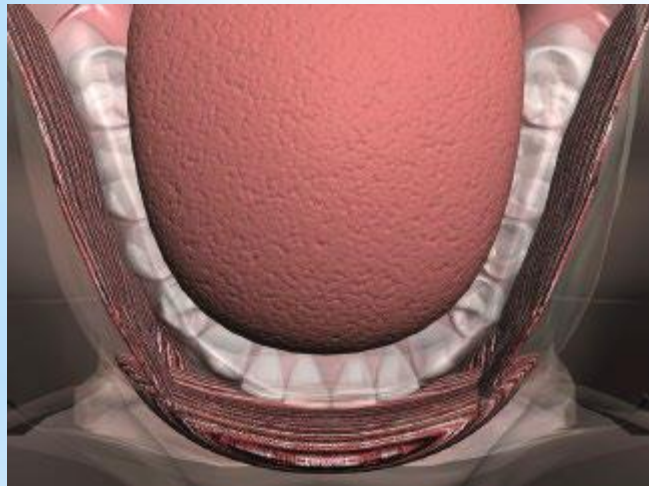


- * 5) The incisal length of the neutral zone record is compared with the patient's relaxed lower lip.

* The neutral zone record should be maintained at the same height as the relaxed lower lip length when the lips are parted.

* If the record is longer than the relaxed lower lip, a line is scribed at the level of the relaxed lower lip cooled and adjusted with a sharp blade.

- * 6) When the modeling plastic impression compound has hardened, the neutral zone record is removed from the mouth and evaluated for accuracy.



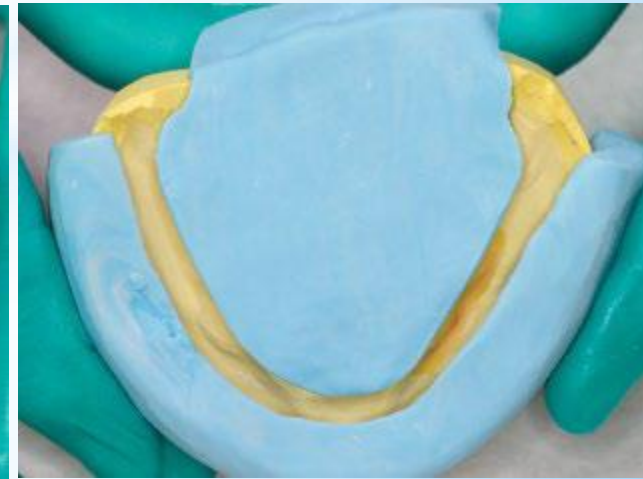
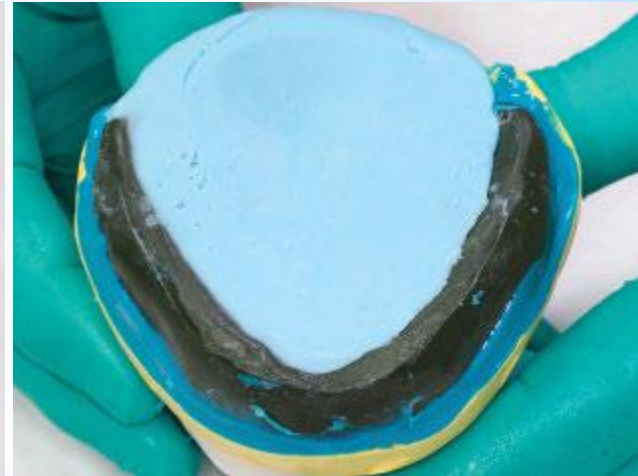
- * If necessary, the procedure is repeated to achieve a proper recording of the neutral zone area.

- * 7) Excess material may be trimmed with a sharp blade.



- * The molded compound rim can be reinserted in the mouth for verification of contours.

- * 8) Next the neutral zone record is seated on the mandibular definitive cast and indexed lingual and facial matrices are developed around the neutral zone record using laboratory putty



* This short and simple procedure uses patients' own physiological action and is therefore very repeatable. Use of this technique provides an excellent road map for optimally positioning the posterior prosthetic teeth in the mandibular denture.

***Recording the Physiologic Neutral Zone for a Dentate Patient**

* Patients who have had significant loss of teeth, severely worn dentition, and reduced OVD (who may be candidates for immediate dentures and or full mouth restorations) often demonstrate decreased muscular tonicity and large tongue volume.

* Accurate registration of the neutral zone in these patients can be accomplished using a single clinical record called the cameogram.

- * The cameogram aids in defining appropriate bucco-lingual position of the prosthetic teeth and thickness, contours, and shape of the denture's cameo surface.

* During development of the cameogram, physiologic molding of impression material is accomplished so that the polished surfaces of restoration will be in physiologic harmony with the muscles of the lips, cheeks, and tongue.

*Technique

* High viscosity vinyl polysiloxane (VPS) impression material is injected under the lips to the full extent of the labial / buccal vestibules



*The patient is instructed to perform the sequence of oral movements to mold the VPS registration material.

* Appropriate movements for molding the registration material include: puckering lips forward, smiling, opening and closing the mouth, and moving the mandible from side to side.

***These maneuvers are repeated several times.**

*After adequate polymerization of the registration material it is carefully removed from the mouth and evaluated .



- * Similarly, a high viscosity VPS impression material is injected on the lingual aspect of the mandibular arch to the full extent of the lingual vestibule.



* Appropriate movements for molding the lingual registration include extending the tongue and moving it from left to right and licking the upper and the lower lips with the tongue.

***These maneuvers are repeated several times.**

* After adequate polymerization, the registration is carefully removed from the mouth and evaluated .

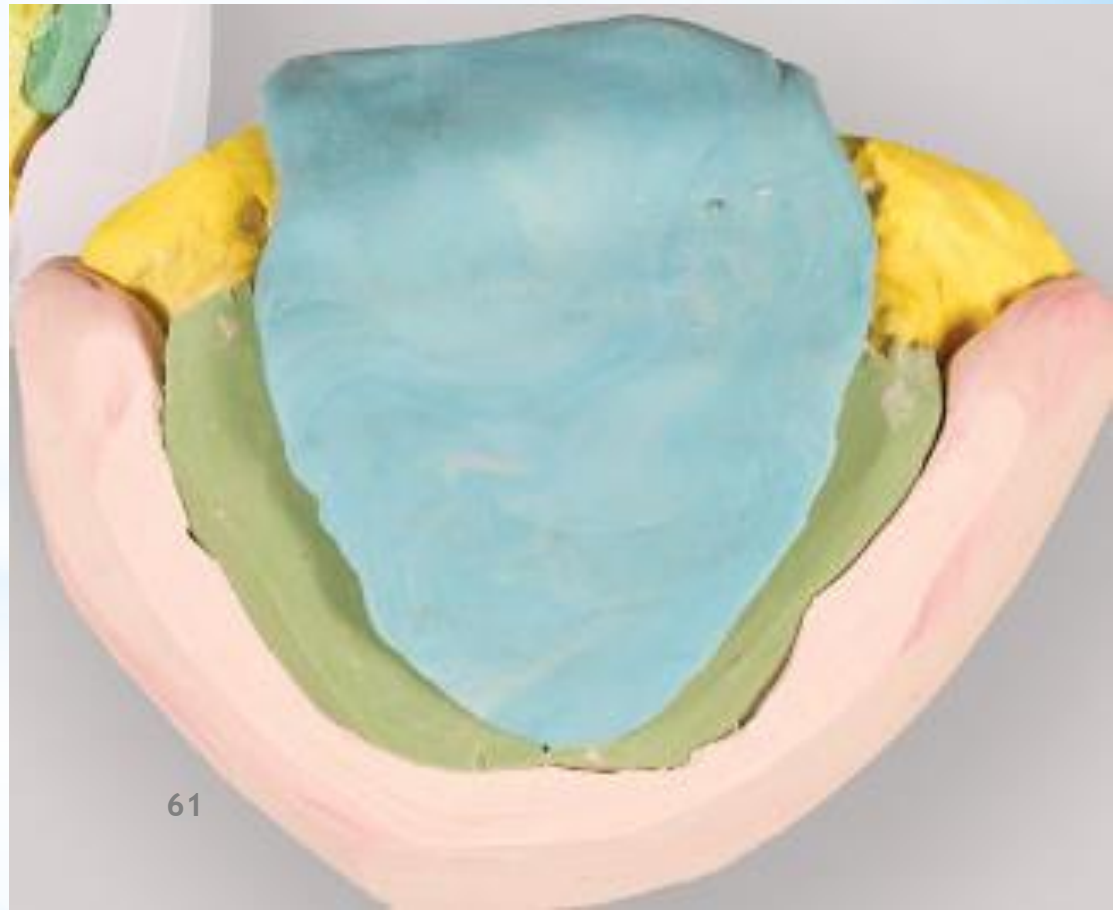


* When there are significant areas of missing teeth a record base with a modeling plastic impression compound rim is fabricated to record the neutral zone in the edentulous spaces.

*The rim is heat softened and placed into the mouth.

*The patient swallows to register the inward forces of the cheeks and the outward forces of the tongue as described above (“Recording the physiologic neutral zone for edentulous patient.”)

* Finally, VPS putty matrices are fabricated to surround these registrations and, oriented to an indexed position on the master casts.



* These matrices will later be used to transfer physiologic boundaries of the registered neutral zone to cameo surface contour of transitional and / or definitive prostheses.

*Summary

***With meticulous attention to the polished surface of the prosthesis, optimal stability, retention, and comfort of the definitive complete dentures is possible.**

***Thank you for
your kind
listening**