

Phonetic Method of Measuring Occlusal Vertical Dimension

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It must be emphasized that patients with opposing natural teeth should be maintained at the vertical of their of their maximum intercuspation position. The phonetic technique is used when there are no opposing teeth in contact. It is an ideal method for use in full denture construction but has equal value for the restorative dentist when a restored arch is opposed by a denture, when the vertical has been altered by improper restorations, or in any relationship without adequate opposing tooth contacts.

To understand the principle, one may perform the following steps, as outlined by Silverman, on a patient with opposing teeth.

1. The patient is seated in an upright position with the occlusal plane parallel to the floor. He is asked to close firmly (centric occlusion), and a line is drawn on a lower anterior tooth at the exact level of the upper incisal edge (fig. a). This line is called the *centric occlusion line*.
2. Now the patient says *yes* and continues the *s* sound like *yesssss*. While he is pronouncing the *s* sound, a line is again drawn on the same lower anterior tooth at the level of the upper incisal edge. This line is called the *closest speaking level line* (fig. b). The space between the lower centric occlusion line and the upper closest speaking line is called the *closest speaking space*.
3. To analyze how repeatable this record is, the patient should be asked to count from 60 to 66. One should notice how the upper incisal edge comes back to the closest speaking line with the pronunciation of each *s* sound. If it does not, the line should be altered slightly to match the *s* position when the patient reads or talks fairly rapidly.
4. If such a measurement is to serve as a preextraction record, the difference between the closest speaking line and centric occlusion line is recorded. The closest speaking space must be maintained in the finished denture.
5. If the determinations are being made on a patient who has already lost the natural occlusal vertical dimension, the missing teeth can be substituted for on temporary restorations or on fabricated bases. After proper lip support, esthetics, and incisal edge position have been determined, the phonetic method can be used to establish the vertical dimension. Since the vertical dimension of occlusion is unknown, we determine the closest speaking position first and then close the vertical 1mm from that point. A wax esthetic control rim (fig. c) can be used in place of upper teeth. It can be attached to the upper denture base and adjusted for lip support, smile-line esthetics, and the like. If it interferes during the phonetic exercises, it can easily be corrected. By placing several marks on the lower anterior teeth, we can observe which mark aligns with the incisal edge of the esthetic control rim or the artificial upper anterior teeth (figs. d and e) when the *s* sounds are made.

There should be no bumping of the teeth during speaking. Such contacts would indicate either interference to the correct vertical dimension or insufficient overjet. When normal phonetic function can take place comfortably, the closest speaking level should be noted and the centric bite record should be made by closing 1mm farther to the vertical dimension of the occlusion.

The vertical dimension has long been regarded as one of the variables of occlusion, but with time more and more evidence has been found that points to a need for more preciseness. Perhaps some of the confusion comes from the loss of vertical dimension that occurs in denture patients as the ridges resorb. However, natural teeth do not react the same as edentulous ridges. More scientific study is needed, but on a basis of clinical evidence and studies of muscle physiology, the safest approach for restorative patients with natural teeth is – work as close to the existing vertical dimension of occlusion as possible.



fig. a
Centric occlusion line. With the patient's teeth in maximum occlusal contact a line is drawn on a lower anterior tooth at the exact level of the upper incisal edge. This is referred to as the "centric occlusion line."



fig. b
The position of the line when the patient says yesss.... Notice that the distance from the line to the incisal edge of the s sound is about 1mm. A new line is drawn at the incisal edge position that is repeated during the s sound. This is called the **closest speaking line**. Observe how precisely the closest speaking line is repeatedly aligned with the upper incisal edge on s sounds.

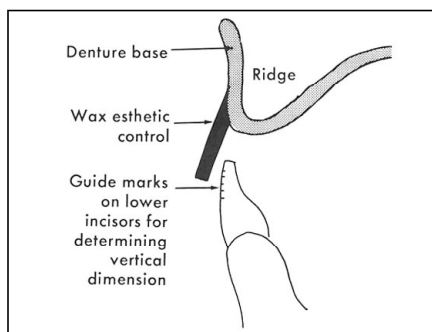


fig. c
Determining the vertical dimension when the upper arch is edentulous. A wax esthetic control rim is added to the labial of a processed acrylic denture base. The esthetic control rim is used to establish correct lip support and incisal edge position. When this is accomplished, several lines are drawn 1mm apart on the lower incisors. On s sounds, the line that repeatedly aligns with the incisal edge of the esthetic control rim is selected

as the closest speaking line. The centric bite record is then made with the vertical dimension closed 1mm from the closest speaking line, and that vertical is accepted as the correct vertical dimension of occlusion.

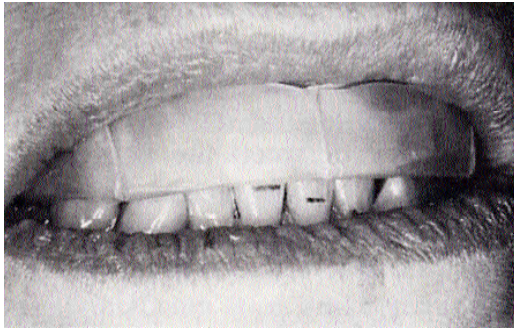


fig. d

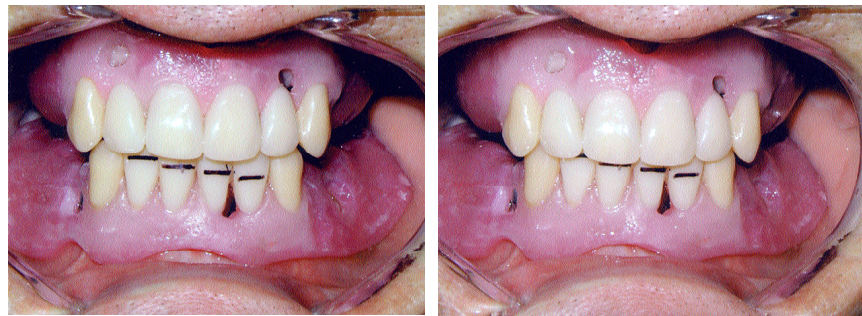
An esthetic control rim in place. Length and lip support have been determined so that the lower edge of the rim represents the precise incisal edge position. Lines are drawn on the lower incisors so that it will be easy to determine which line is repeatedly aligned with the edge of the rim when the s sounds are made.



fig. e

The patient says yesssss or counts from 60 to 66. At each s or x sound, the line on the patient's right central aligns with the edge of the control rim. This line is then accepted as the closest speaking line. The vertical dimension of occlusion is set 1mm closed from this position.

Peter E. Dawson, DDS. *Evaluation, Diagnosis, and Treatment of Occlusal Problems, Second Edition.* St. Louis: CV Mosby Company, 1974.



Example of markings with teeth in place.

BVDL Note:

It should also be noted that the "s" sound may be made one of two ways. For most patients, the mandible translates to an end-to-end position. This is referred to as the typical "s" sound. A smaller percentage of patients will form the "s" sound in an overlapped position. This is called the atypical "s" sound.

