Methods of recording vertical dimension

Methods of recording V.D.R (rest position):

V.D.R is measured usually on the face by a ruler or divider between two selected points marked by indelible marker above and below the mouth mostly on the nose and chin with one of the following methods:

1-Facial measurements after swallowing and relaxing:

The patient should sit comfortably upright with the head erect with the eyes looking straight ahead, ask the patient to swallow and relax his facial muscles and measure the V.D.R and repeat until getting a consistent measurement.

2- Tactile sense: The patient should stand erect and open his jaw widely until strain is felt in the muscles and become uncomfortable, ask the patient to close slowly until reaching a comfortable and relaxed position and measure the V.D.R.

3 – Phonetics: Ask the patient to repeat the name (emma) and when his lips touches at syllable (em) stop jaw movements to measure the distance between the two marked points.
Or making a conversation with the patient and pause in speech followed by relaxation by a drop of the mandible can give V.D.R.

4 – Facial expression: The experienced dentist learns to recognize the relaxed facial expression and musculature at rest.

5 – Anatomic landmarks: Willis gauge is designed to measure the distance from the pupils of the eye to the corner of mouth (rima oris) and the distance from anterior nasale spine to the lower border of the mandible. At rest these measurements must be equal, but this method can't be used in a symmetric face

Methods of recording V.D.O (occlusion):

- **Mechanical methods:**
- **Physiological methods**

- **Mechanical methods:**

(1)Ridge relation:

A) Relation of incisive papilla to incisors: is stable and fixed landmark that change comparatively little with ridge resoption. In diagnostic cast of natural dentition, the distance between the incisive papilla to incisal edges of lower anterior teeth is 4mm and to upper anterior teeth is 6mm so the mean vertical overlap of upper and lower incisors is 2mm. These measurements must be occurring in trial dentures on the articulator but they don't appear to be relevant in sever ridge resorption.

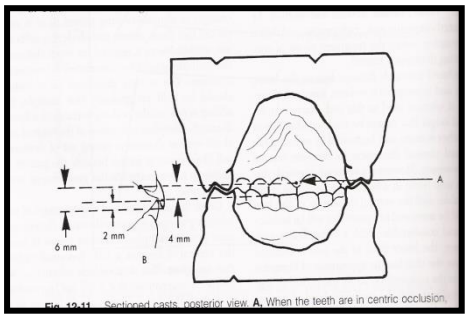


Fig. 12-11 Sectioned casts, posterior view. **A,** When the teeth are in centric occlusion.

B) Parallelism of the ridges: Parallelism of the ridges plus a 5 degree opening in the posterior region between the related upper and lower casts on the articulator gives the correct V.D.O. the ridges will loss the parallelism after teeth loss.

(2)Former dentures: measurements between upper and lower borders of former dentures that the patient has been wearing by means of a Boley's gauge can be correlated with observation of the patients face and compared with that of the new dentures.

(3)Pre-extraction records: before extraction of the defected remaining teeth we can make any of these methods:

1.Prophile photograph: made with the teeth in maximum occlusion and comparing the measurements of anatomic landmarks between that on the photograph and the face after jaw relation recording and in try-in step.

2.Prophile silhouettes: by a cardboard or contoured in wire and repositioned to the face after jaw relation recording and in try-in step.

3.Radiography: Cephalometric radiograph give an indication of V.D.O, compare with the radiograph after jaw relation recording and in try-in step, but this method can't be used widely because of radiation risks.

4.Articulated casts: by using of accurate diagnostic casts mounted on an articulator, this gives an indication of the amount of space required between the ridges for the teeth.

5.Facial measurements: V.D.O is measured before extraction between two points on nose and chin by means of a pair of calipers or dividers, and then compared with the measurements made between these points when artificial teeth are tried in.

- **Physiological methods:** including edentulous patient with no pre-extraction records:

(1) Physiological rest position:

This method suggests the patient is relaxed and his trunk upright and the head unsupported, ask the patient to swallow and let the jaw relax while the wax occlusion rims are inside his mouth. The patient must allow the dentist to separate the lips without help or moving the jaws or lips.

It should be 2-4mm space in premolar regions, if it is more than 4mm, the V.D.O may be considered too small and vice versa.

So the bite rims should be adjusted until the patient becomes comfortable and the dentist satisfied with interocclusal space that performs esthetic and speech demand.

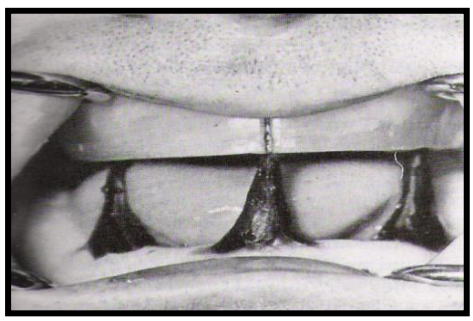
2. Phonetics and esthetics:

Phonetics consists of listening to speech sound production; the production of (ch, s and j) sounds brings the anterior teeth close together in case of correct V.D.O. If the free way space is too large, these sounds will not have pronounced correctly, it means that a too small V.D.O may have been established. If the anterior teeth click together when these sounds are made the V.D.O is probably too great because of decreased free way space.

Esthetic also is affected by vertical relation of mandible to maxillae. In decreased V.D.O, the lips are not correctly supported and will be more nearly vertical than when supported by natural teeth. In such situation the tendency to increase V.D.O to provide support can be disastrous.

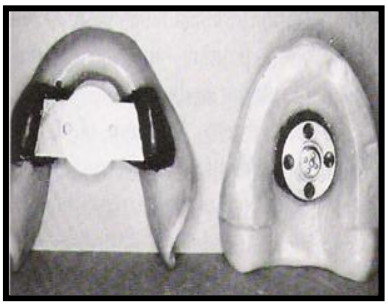
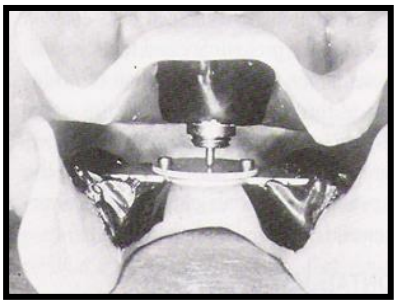
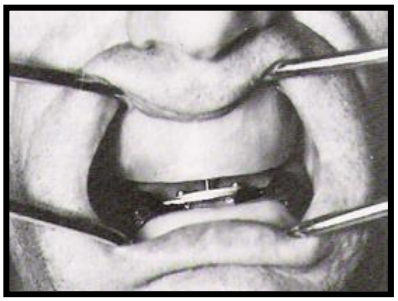
3. Swallowing threshold:

Position of the mandible at the beginning of the swallowing act as a guide to the correct V.D.O. The technique involving building a cone of soft wax on the lower denture base contacts the upper occlusion rim when the jaws are open too wide, with repeated action of swallowing will gradually reduce the height of the wax cone to allow the mandible to reach the level of V.D.O.



4. Neuromuscular perception(patient's tactile sense):

it is suggested by (Lytle) this method measures the V.D.O. by using of an adjustable central bearing plate attached to lower occlusion rim and central bearing screw attached in the palate of upper occlusion rim which is adjusted to measure the V.D.O, permits the patient to experience through neuromuscular perception the different vertical relations. The screw is adjusted until the patient indicates that the dimension is about right.

5. Power point: as suggested by (boos), the theory based on that when teeth come into contact, maximum force or power point measured by bimeter is exerted when this contact occurs at the correct V.D.O.

Problems of incorrect V.D.O:

Increased V.D.O can cause the following:

1. Speech problems.
2. Sensation of bulky dentures.
3. Premature contact and clicking during function.
4. Increased rate of residual ridge resorption.
5. T.M.J and muscle pain and fatigue.
6. Poor esthetic like seperated lips and display of the teeth.
7. Inability to open the mouth widely.
8. Loss of biting power.

Decreased V.D.O can cause the following problems:

1. Poor esthetic like unsupported lip, prominence of mandible and chin and presence of excessive wrinckles and folds in the corner of the mouth which may lead to angular chilitis.
2. Loss of biting power and decreased chewing ability.
3. T.M.J and muscle pain and fatigue.
4. Cheek biting.
5. Neuralgia or other features.