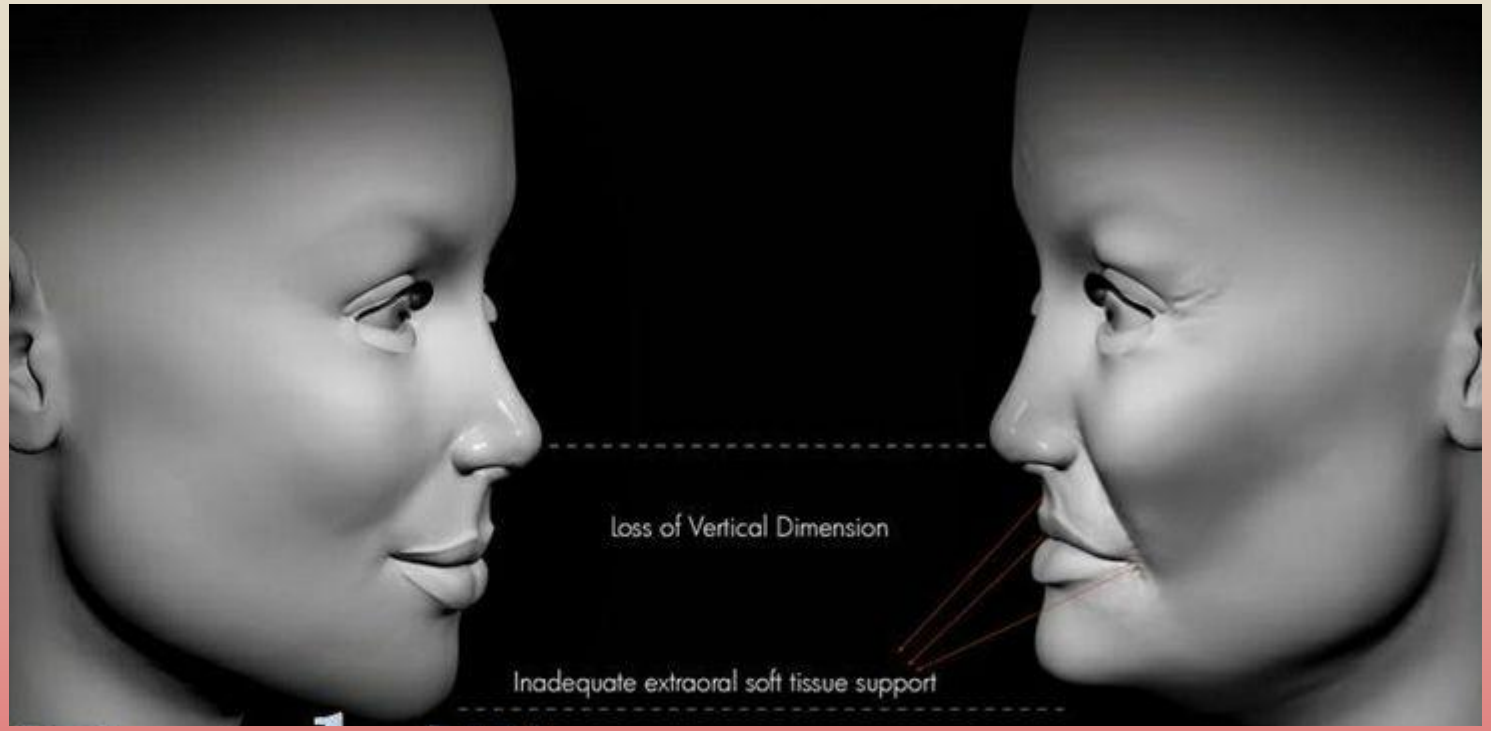
MAXILLOMANDIBULAR RELATIONS :

Vertical Jaw Relations

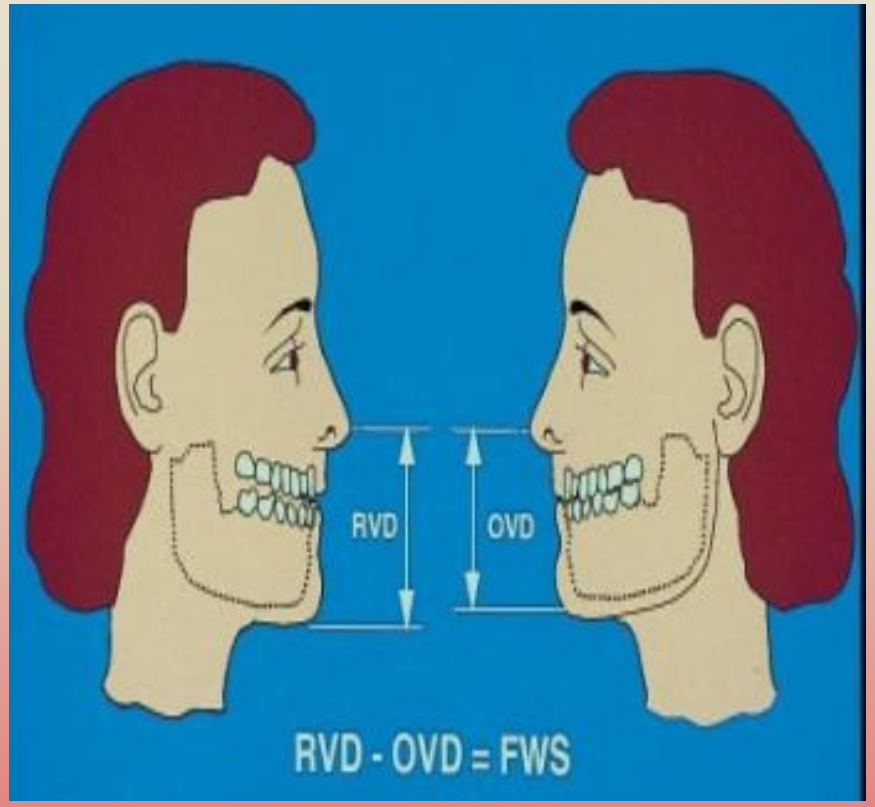
What is it ??!!

- Vertical jaw relations are those established by the amount of separation between the maxilla and mandible under specified conditions



Classification

- Vertical dimension at rest [VDR]
- Vertical dimension at occlusion [VDO]



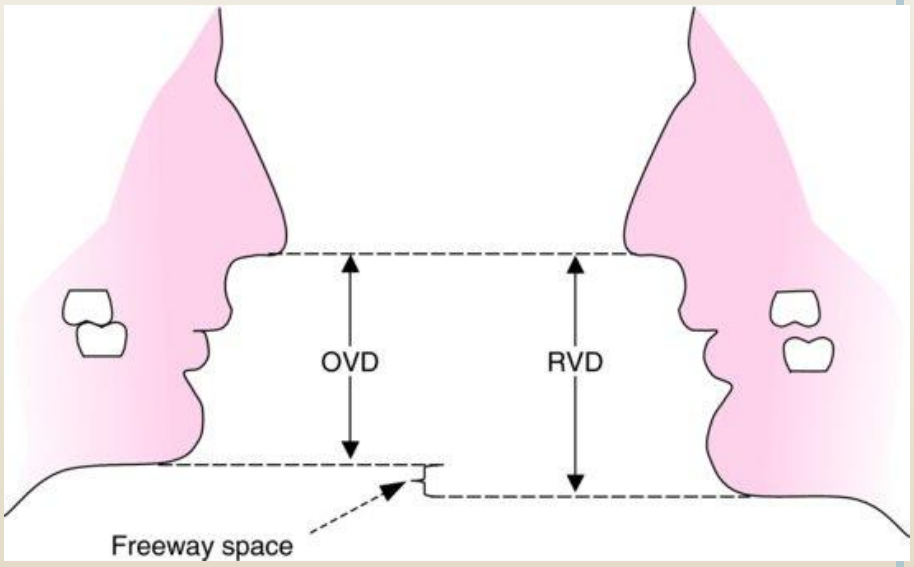
Vertical dimension at rest

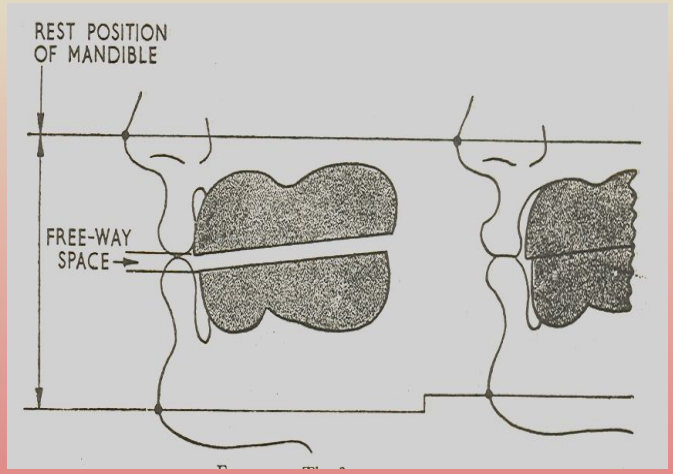
- The length of the face when the mandible is in rest position

- Physiologic rest position of mandible = minimal tonic contraction of muscles + gravity

Freeway space

- Distance or gap existing between upper and lower teeth when the mandible is in physiologic rest position
- Freeway space = VDR – VDO
- Normal value : 2 – 4mm at premolars





Significance of freeway space

- Health of periodontium

Failure to provide freeway space :

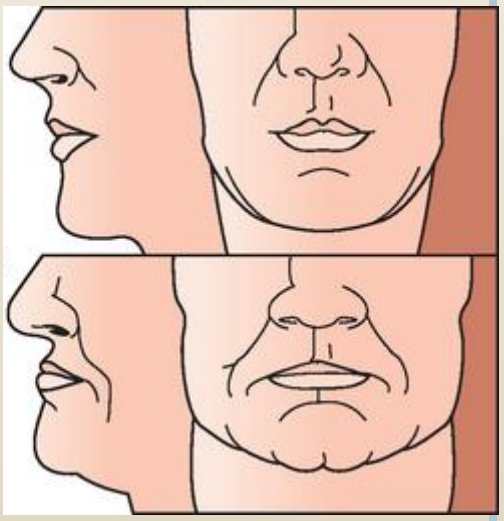
- Clicking of dentures during speech
- Soreness of basal seat tissues
- Rapid resorption of alveolar tissues

Increased vertical dimension

- Trauma to basal seat tissues
- Dentures easily displaced
- Denture clicking
- Changes in facial appearance
- Difficulty in deglutition
- TMJ problems
- Cheek biting
- Increased cubical space of oral cavity

Decreased vertical dimension

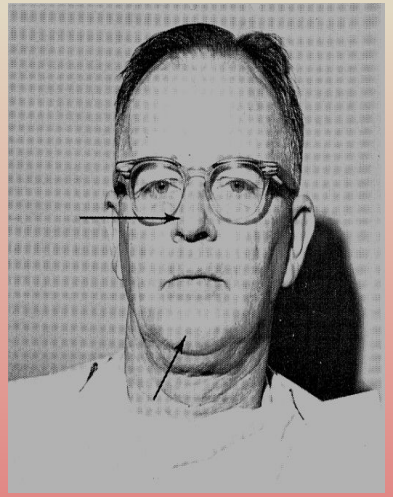
- Decreased lower facial height
- Loss of lip fullness
- Reduces vermillion border
- Corners of mouth are turned down
- Loss of muscle tone
- Angular chelitis
- Ear problems due to encroachment of tissues on eustachian tubes
- Loss of cubical space of oral cavity



Methods to record vertical dimension at rest

Facial measurements after swallowing and relaxing

- Reference points on chin and nose
- Patient wets lips and swallows; relaxes shoulders
- Measure between reference points

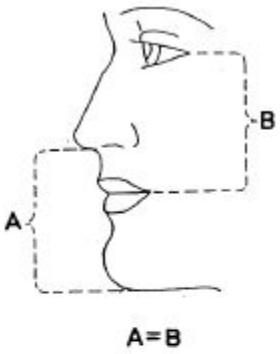


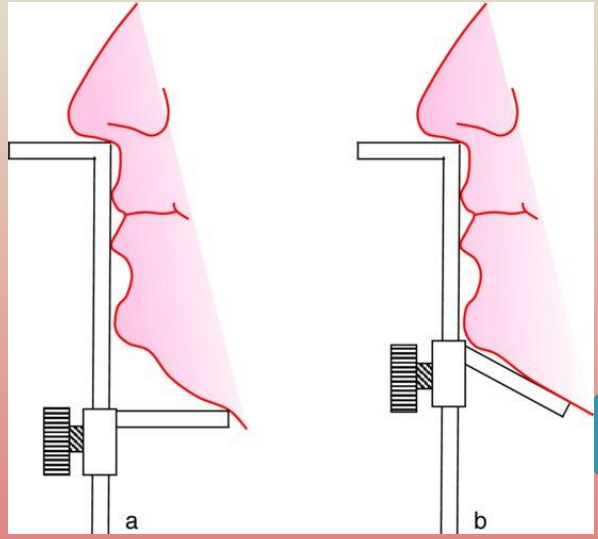
Tactile methods

- Open wide till patient feels discomfort
- Close mouth slowly till muscles completely relax
- Measure between reference points

Anatomic landmarks

- Distance between pupil to rima oris = distance between anterior nasal spine and lower border of mandible
- Use Willis gauge





Speech

- Pronounce ‘m’ several times
- Measure between reference points

Facial expression

- Relaxed skin around eyes
- Upper and lower lip have slight contact in single plane

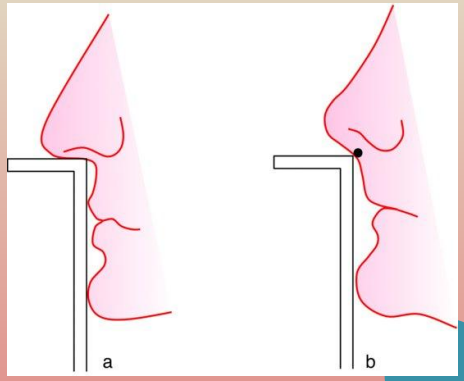
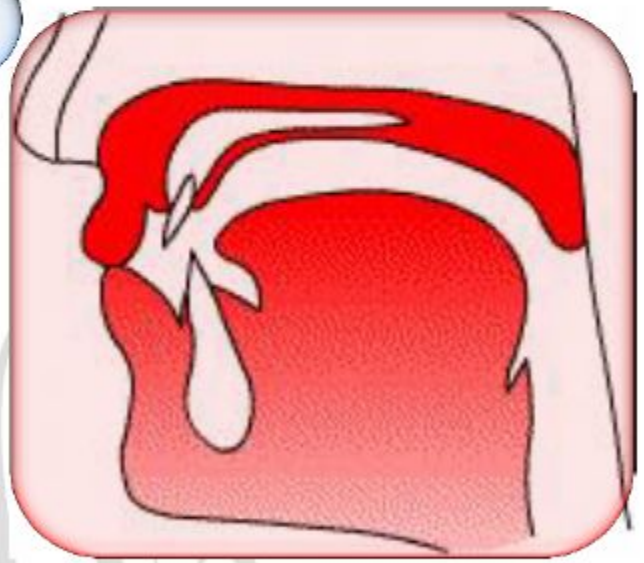


Figure (6-44):
/m/ sound



Vertical dimension at occlusion

Length of the face when teeth are in contact and mandible is in centric relation or teeth are in centric occlusion

Methods to record vertical dimension at occlusion

Mechanical methods

- Ridge relation
- Pre- extraction records
- Measurement from former dentures

Physiological methods

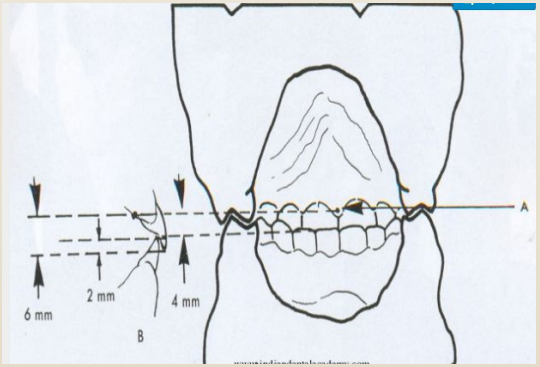
- Power point
- Niswonger and Thomas method
- Phonetics
- Aesthetics
- Swallowing threshold
- Neuro muscular perception
- Patient's perception of comfort

Mechanical methods

Ridge relation

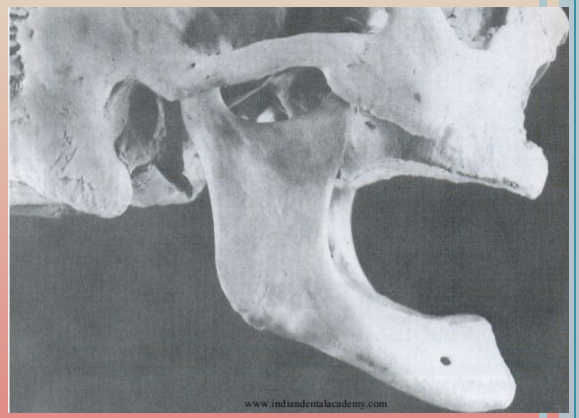
Distance between incisive papilla to mandibular incisors

- Usually 4mm



Ridge parallelism

- Mandible parallel to maxilla in occlusion [associated with 5 degree opening of jaw]
- Not reliable if teeth are extracted at different periods



Pre-extraction records

- Profile silhouettes
- Profile photographs
- Radiography
- Articulated casts facial measurements

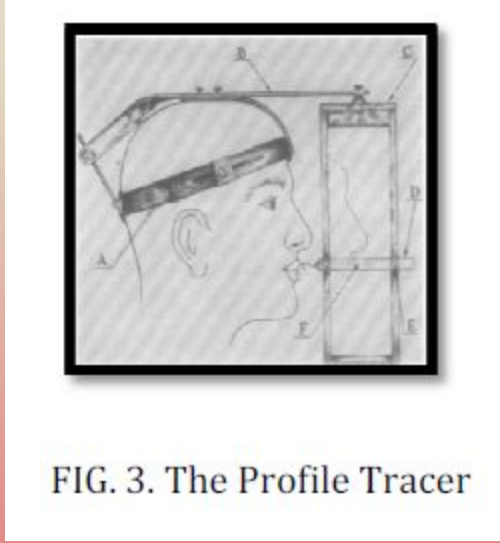
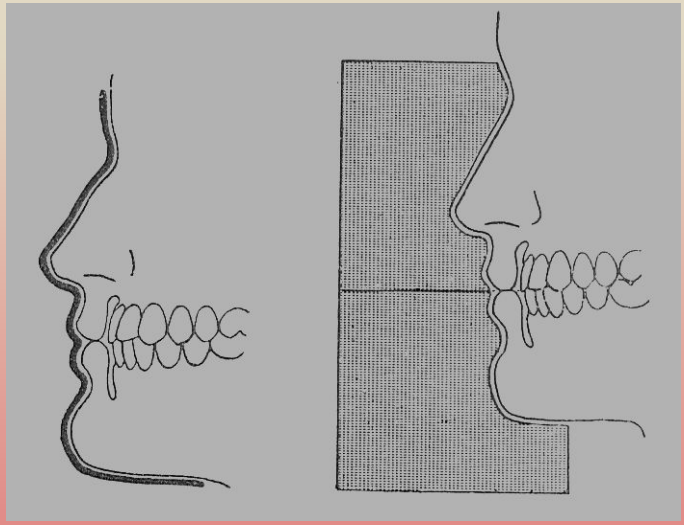
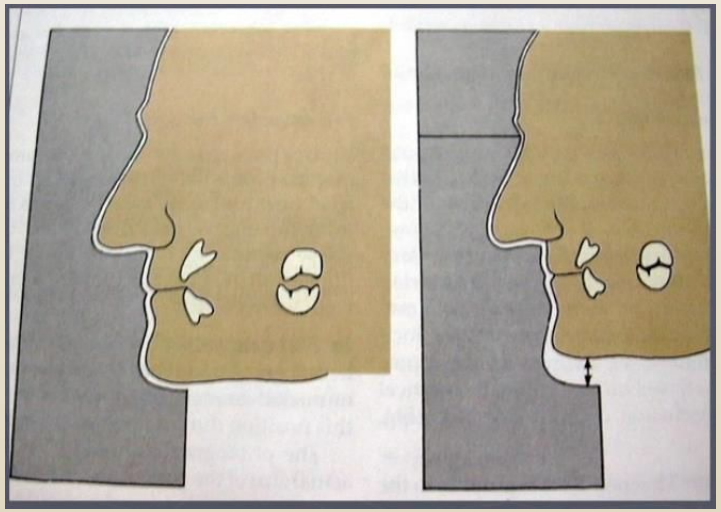


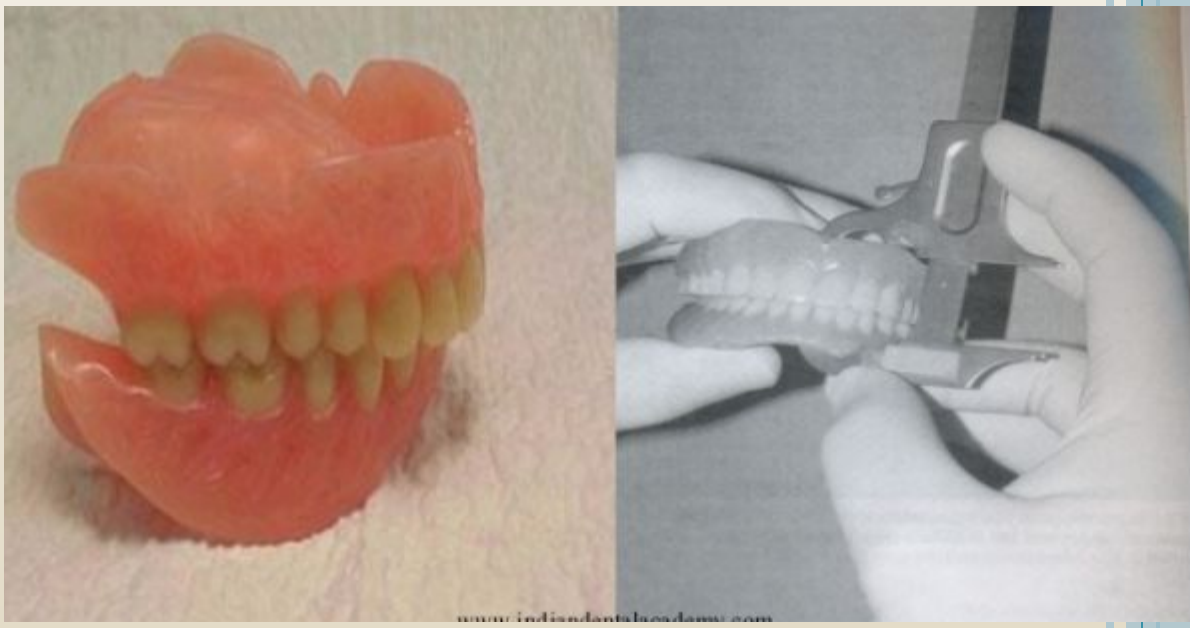
FIG. 3. The Profile Tracer

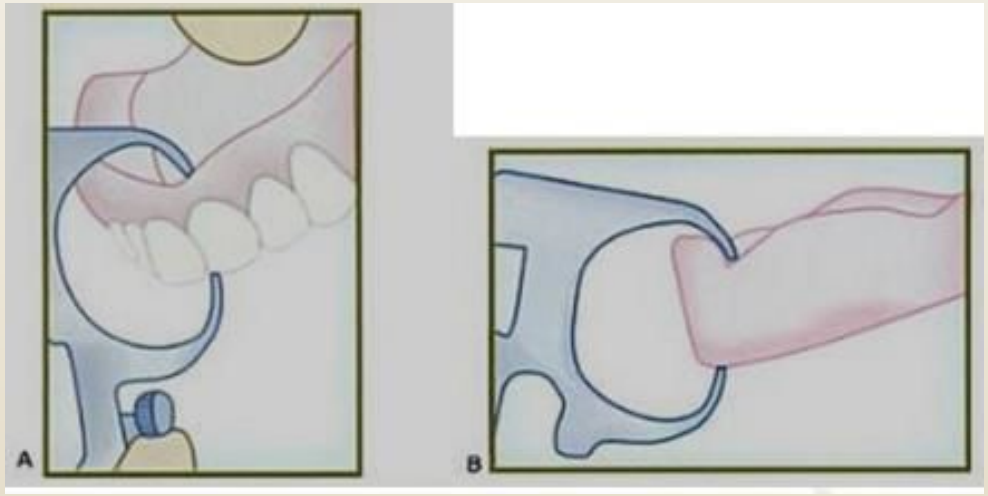


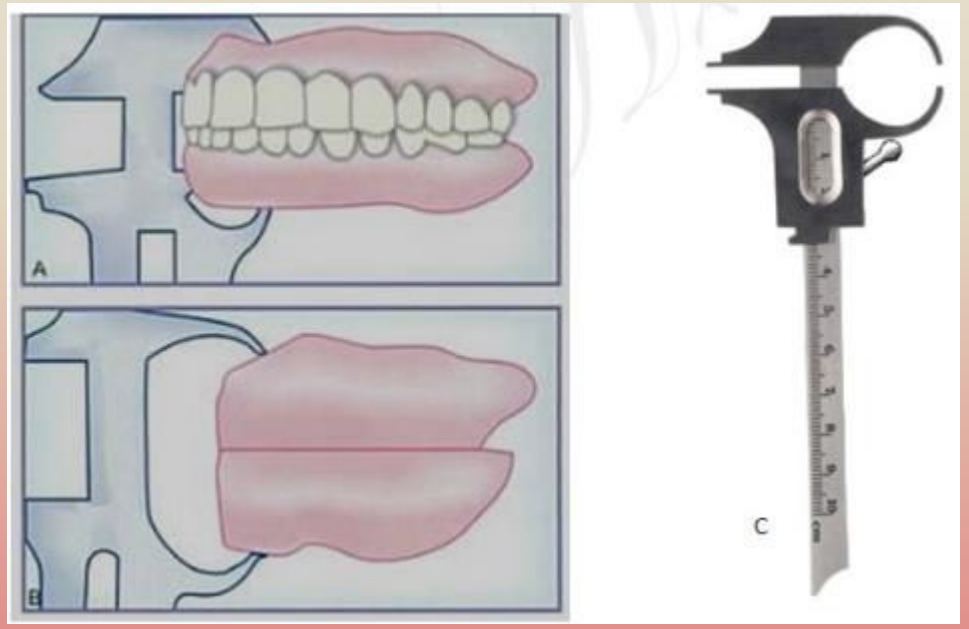


Measurement from former dentures

- Distance between maxillary and mandibular denture border in occlusion
- Boley's gauge




A
B

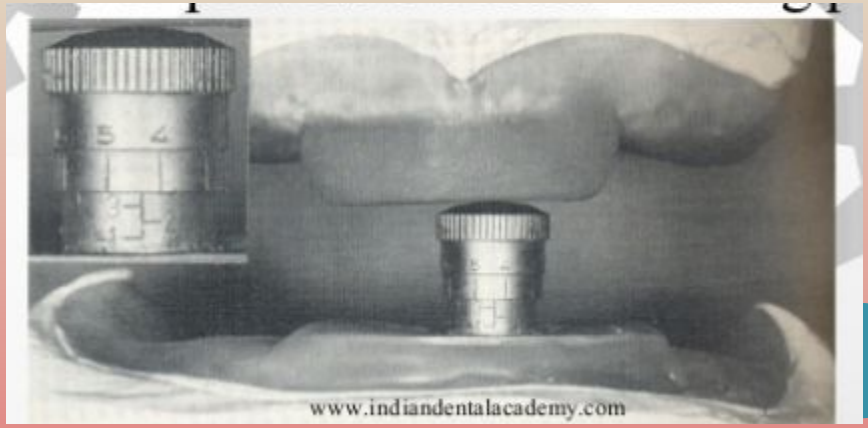

A
B
C

Physiologic methods

Power point [by Boos]

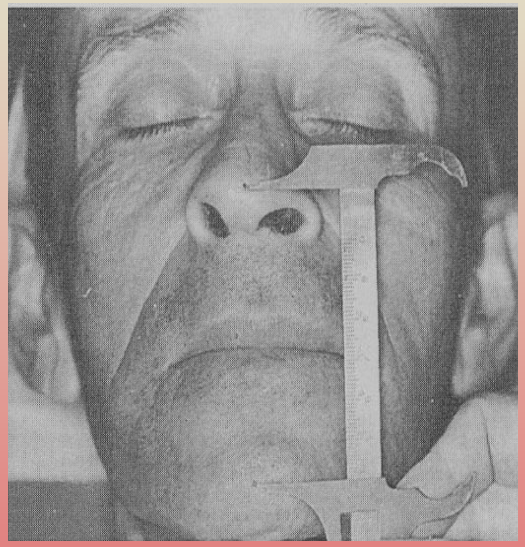
- Bimeter is attached to mandibular record base
- Patient bites on record bases at different degrees of jaw separation
- VDO is when highest value [Power point] is reached

FIG. 5.Boos bimeter



Niswonger and Thomson method

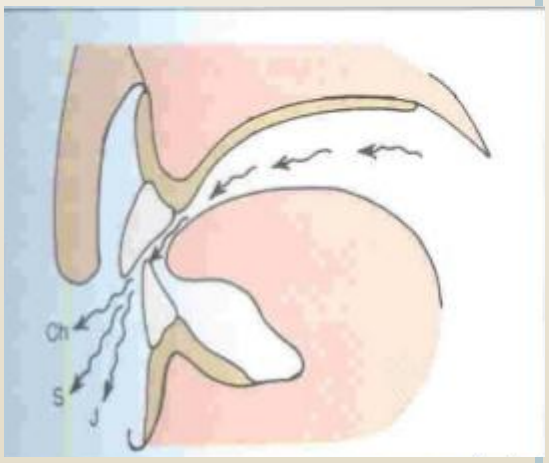
- Upper and lower rims are inserted in mouth
- Patient is asked to swallow and relax
- Part lips to observe Freeway Space [2-4mm]
- VDO less if greater than 4mm and VDO high if less than 2mm

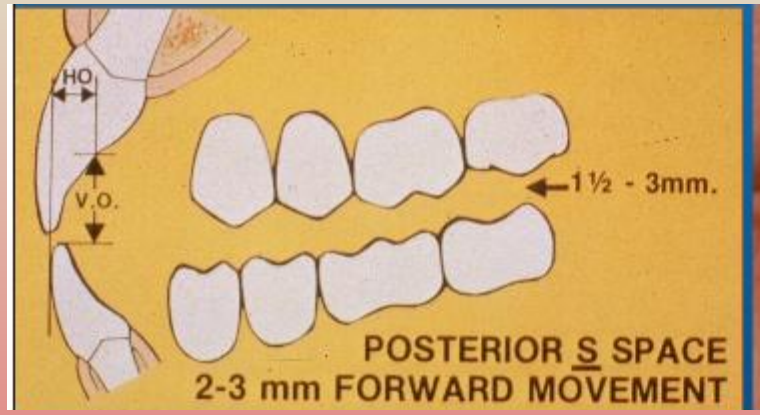


Phonetics

Silverman's speaking space

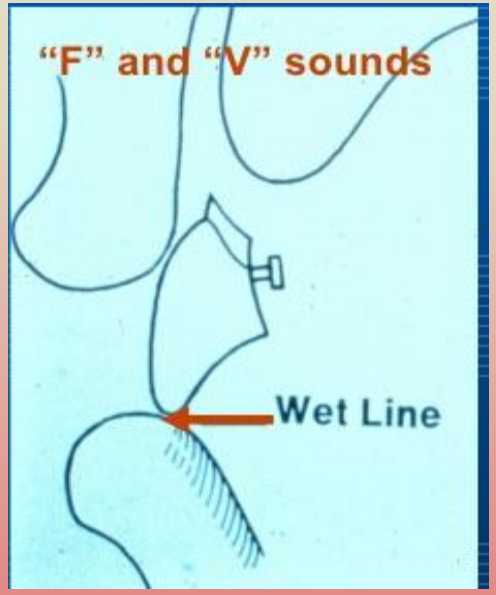
- Upper and lower teeth reach closest relation *without contact* when pronouncing sounds like ch,s and j
- Excessive distance – too small VD and vice versa

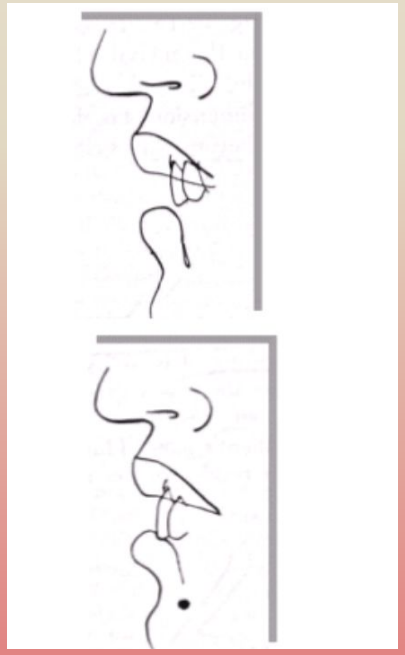


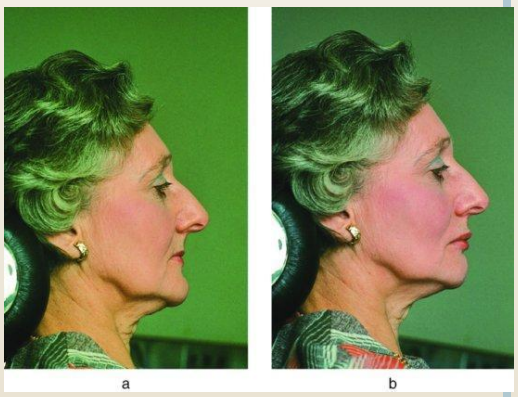


Pound and Murrel method [f,v and s speaking anterior tooth relation]

- f and v determine location of maxillary anteriors
- S determines location of mandibular anteriors





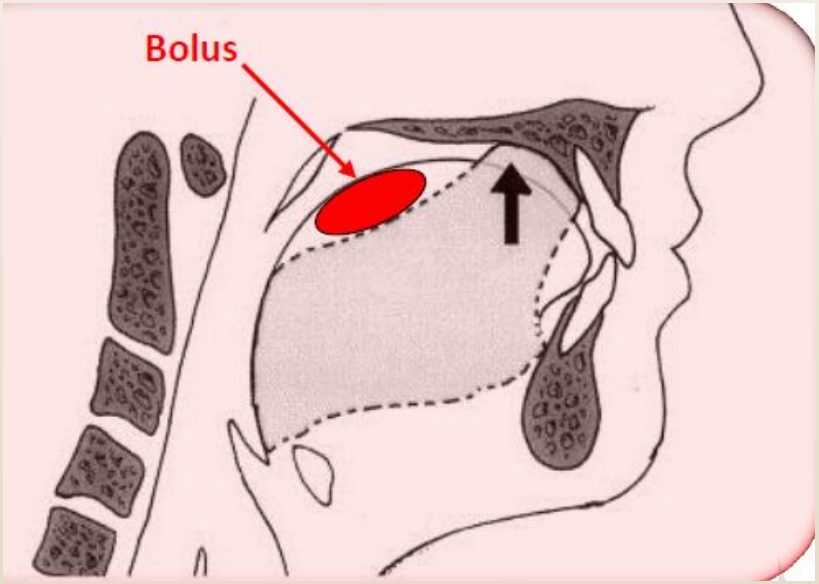


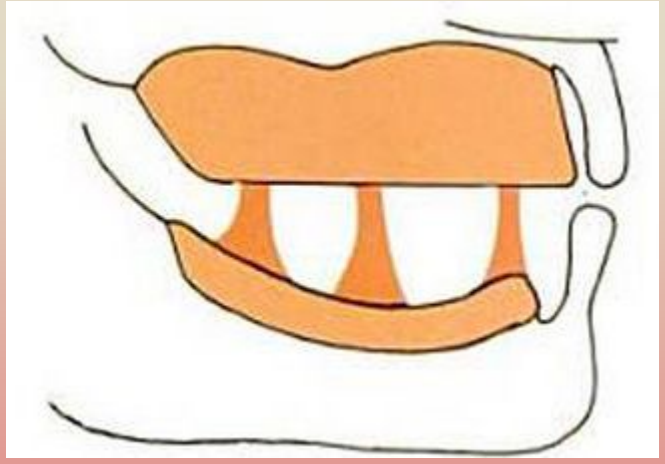
Aesthetics

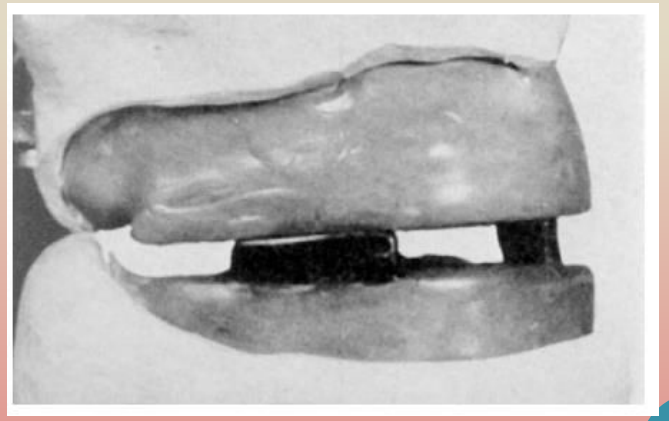
- Skin : nasolabial fold, nasolabial angle etc
- Lips : lip support

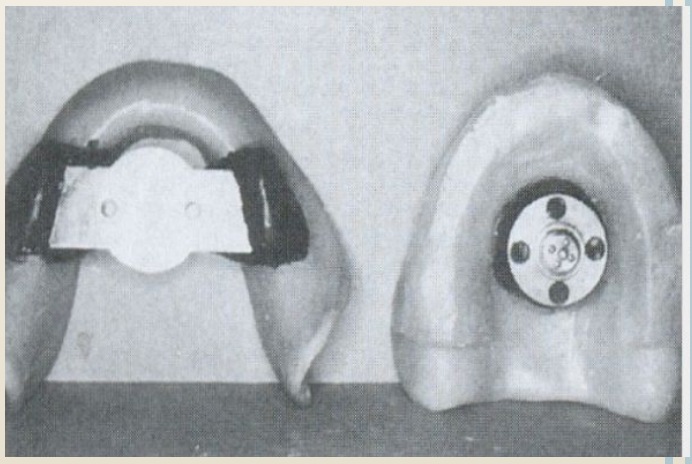
Swallowing threshold

- Teeth almost come in contact during swallowing
- Softened conical occlusal rim of soft wax is used on manibular record base


Bolus

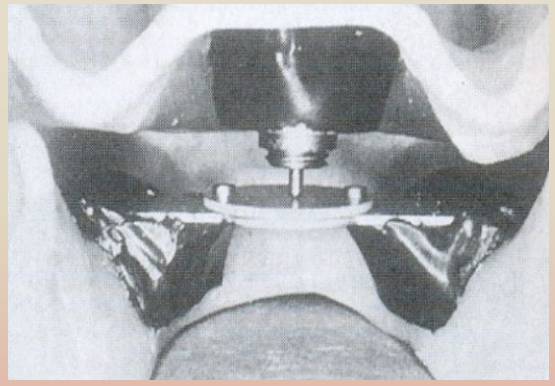






Neuromuscular perception

- Central bearing plate is attached to maxilla and central bearing screw to mandible
- Central bearing point is adjusted till patient indicates a comfortable jaw relationship



Patient's perception of comfort

- Occlusal rims are reduced till patient perceives comfortable height

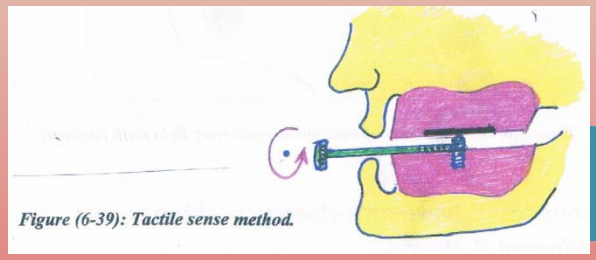


Figure (6-39): Tactile sense method.

Conclusion

- Recording VD is critical
- Errors affect health of TMJ and masticatory muscles
- Easiest to record