Prosthodontics

Modified slides

Prosthodontics

branch of dental arts and science pertaining to the restoration and maintenance of oral function by the replacement of missing teeth and structures by artificial devices.

They are not specific for teeth; they include the adjacent tissues of teeth such as: gingiva, bone, hard and soft palates. Furthermore in our major; they also include eyes and ears.

An example of the prosthesis is Denture.

Denture is an artificial substitute for missing natural teeth and adjacent structures.

Dentures are two types: complete dentures and partial dentures; as shown in the pictures below:

Here the bone and the soft tissue are replaced as well.

- Complete denture is a dental prosthesis that replaces all of the natural dentition and associated structures of the maxilla or mandible.
- Complete dentures (upper or lower or both) are made for edentulous patients (patients with no teeth).



- Partial denture is a dental prosthesis that replaces one or more, but less than all (even if the patient has 1 tooth), of the natural teeth and associated structures (only some teeth are missing).
- Partial dentures are made from

Acrylic or cobalt chromium
(part of it is metal; thereby giving it greater strength)

(Acrylic partial denture)

- Removable partial denture; a partial denture that can be readily placed in the mouth, cleaned, placed in water, and removed by the wearer.

- Partial tooth loss can be restored by either:

1- Fixed partial denture (also called bridges); a partial denture that cannot be removed and placed back into the mouth by the patient.

2-It can be placed on implants. Implants are teeth replacements; anything done to a natural tooth can be done to an implant (to a certain extent).

**Implants retained either by: screws (screw retained implants) OR cementation (cement retained abutments) as shown below:

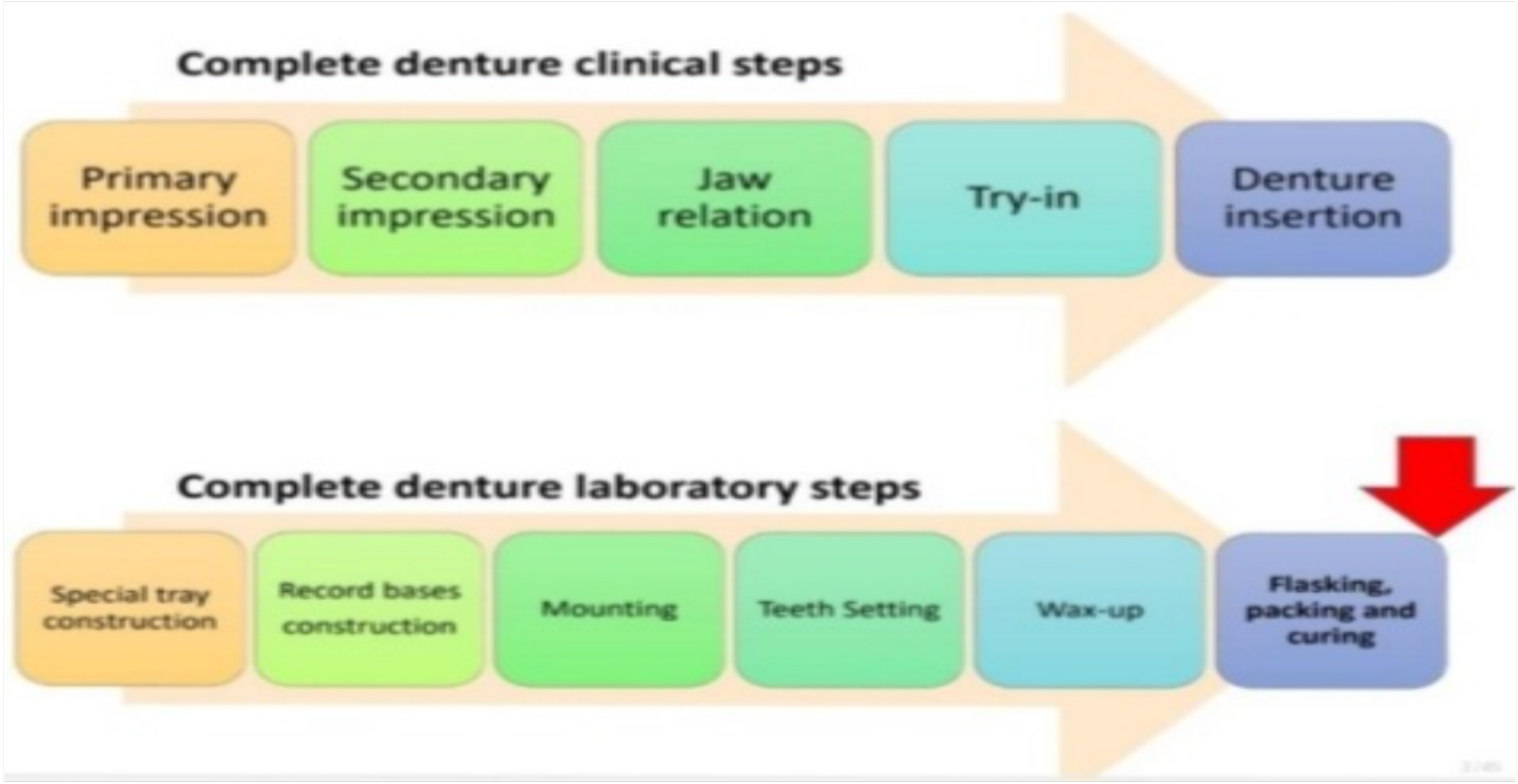
Cement retained implants (abutments)

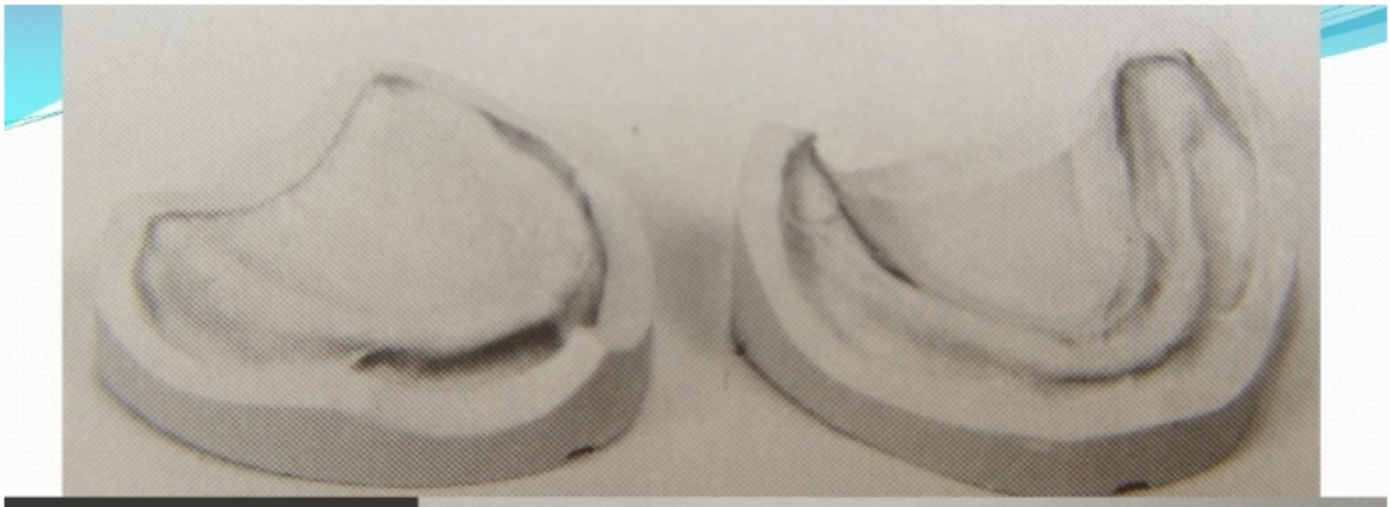
Screws retained implants

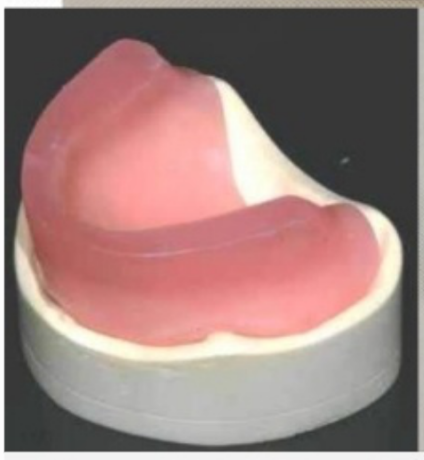
- Tooth loss causes:
- • Carries; sometimes carries require root canal therapy (endodontics) which leads to extraction of the tooth.
- • Periodontal disease; such as periodontitis (disease in the periodontium and tissues around teeth) which is severe gum infection that can lead to tooth loss and other serious health complications.
- • Trauma.
- • Iatrogenic Dentistry; relating to illness (tooth loss) caused by mistakes in medical examination or treatment by the dentists.
- • Congenital; some people are born without some of their teeth for some disorders such as Amelogenesis Imperfecta (AI).

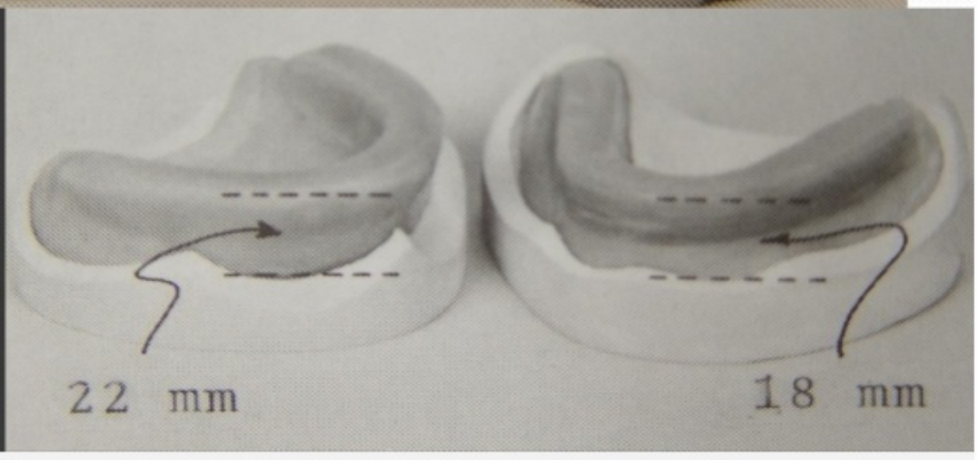
- Amelogenesis Imperfecta (AI) is a disorder that affects the structure and appearance of the enamel of the teeth.

- Denture making steps





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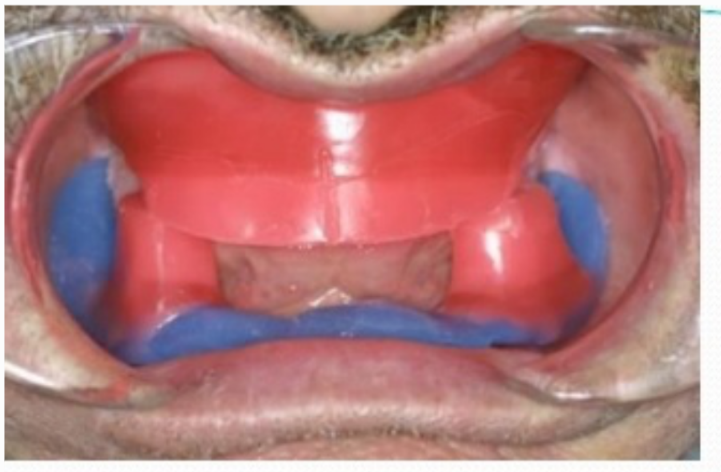
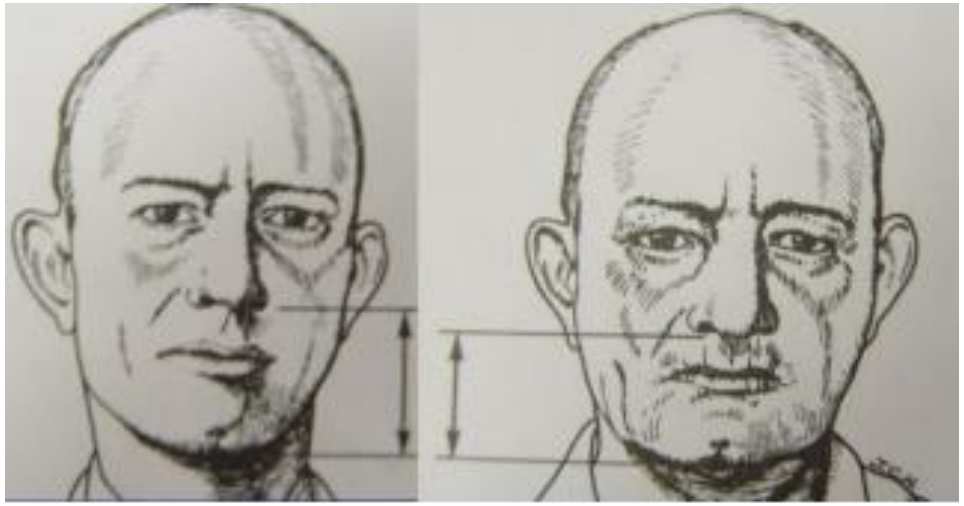


Anatomical changes associated with loss of teeth:

- Bone resorption.
- Diminished masticatory efficiency. Masticatory efficiency is different from masticatory force; efficiency is a measure of how much certain type of food is chewed per unit time, while force measures the bite strength.
- Morphological face height changes; mainly the lower facial third

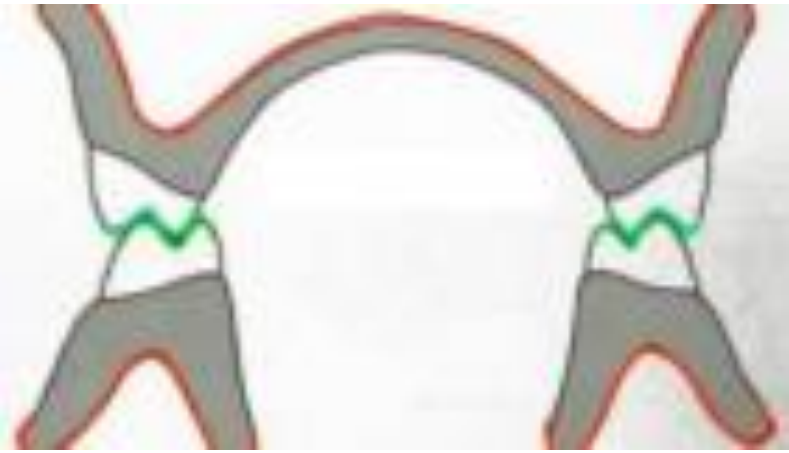


Objectives of prosthodontic treatment:

- Restore masticating function .
- Improve appearance; specially the anterior teeth aesthetically, also missing the posterior teeth decreases the lower facial third causing wrinkles.
- Improve speech .
- Improve psychology; missing teeth can affect the human behavior psychologically making them shy, aggressive, etc .

Red is the fitting surface, which faces the soft tissues of the mouth.

Blue and green is the occlusal surface (where the teeth occlude making an occlusal plane).



Fitting surface

Occlusal surface

Complete denture treatment procedures:

Preparatory phase:

i. Diagnosis and treatment plan (cc, MH (Medical History), DH (Dental History), radiographs, palpitation, measurements).

ii. Surgical procedures prior to treatment; patient might have problems with the ridges or they might have undercuts.

iii. Oral tissues returned to optimum health; the oral tissues needs time to heal after extraction of the tooth approximately 3-4 weeks.

Diagnosis and treatment planning

a. History; medical and dental history of the patient must be taken during the clinical examination on which the treatment plan and the execution of treatment depends.

b. Examination; (visual, existing denture, palpation, measurement, saliva, soft tissue, tongue).

c. Diagnosis.

d. Treatment plan; matching treatment options with patient needs. After the preparatory phase; some patients may not fit for complete dentures.

- Construction phase (requires 5 appointments)

i. Primary impressions; using impression compounds and stock trays, the impression is used to make casts by pouring plaster of Paris or dental stone that are used to construct “special” trays. The special tray is then border molded.

ii. Secondary impression; using zinc oxide eugenol and the “special” tray, the impression is used to make the final “master” cast with more details than the primary cast.

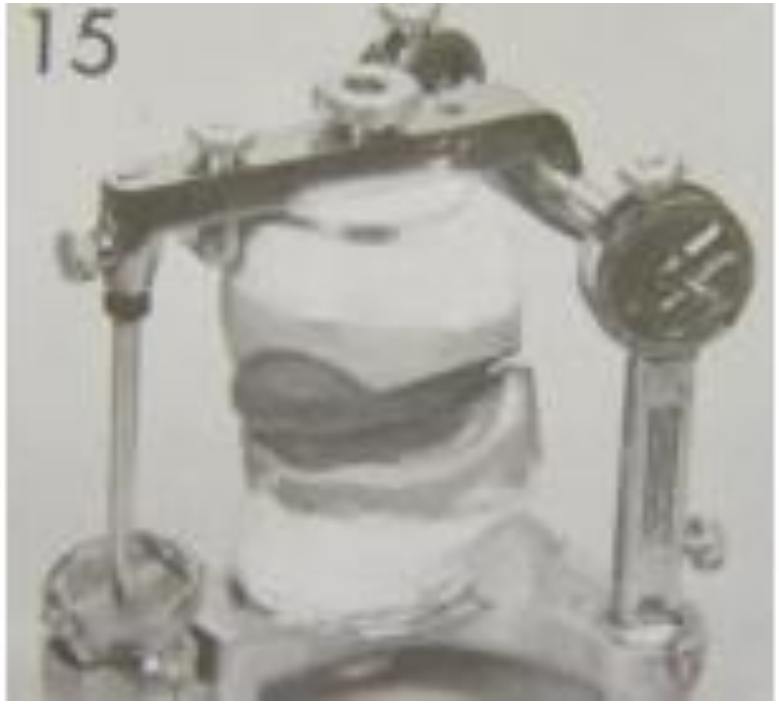
iii. Registration of jaws relation; to check how the jaws occlude in the patient's mouth, measure the dimensions, test for labial and buccal fullness, maxillo-mandibular relationship, patient’s smile, etc.

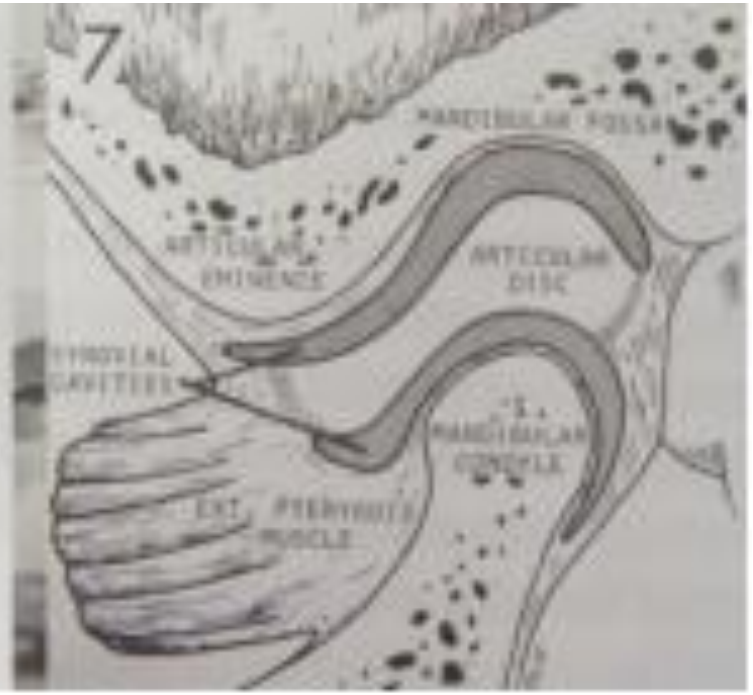
iv. Denture try-in; teeth are set on the wax and the denture is placed in the patient's mouth to test and observe the statics of the denture, occlusion and teeth arrangement.

v. Denture insertion

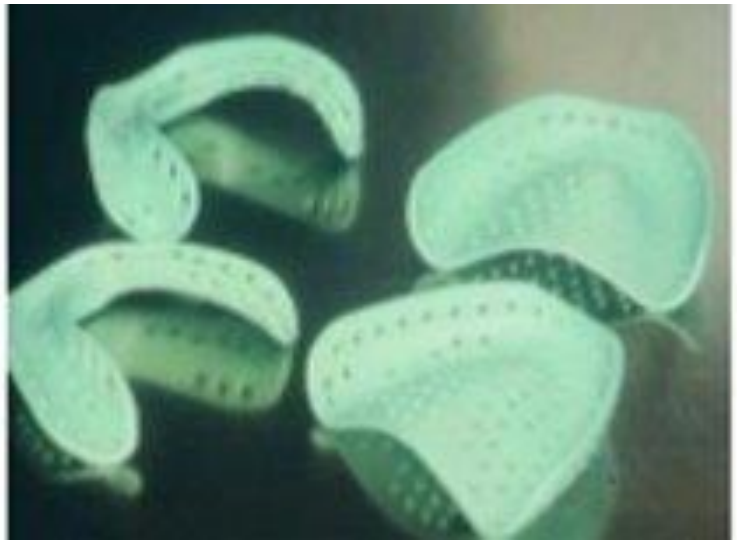
• Then it’s transferred to another machine called articulator a replica of Temporomandibular Joint TMJ to see how the teeth occlude and line up precisely.

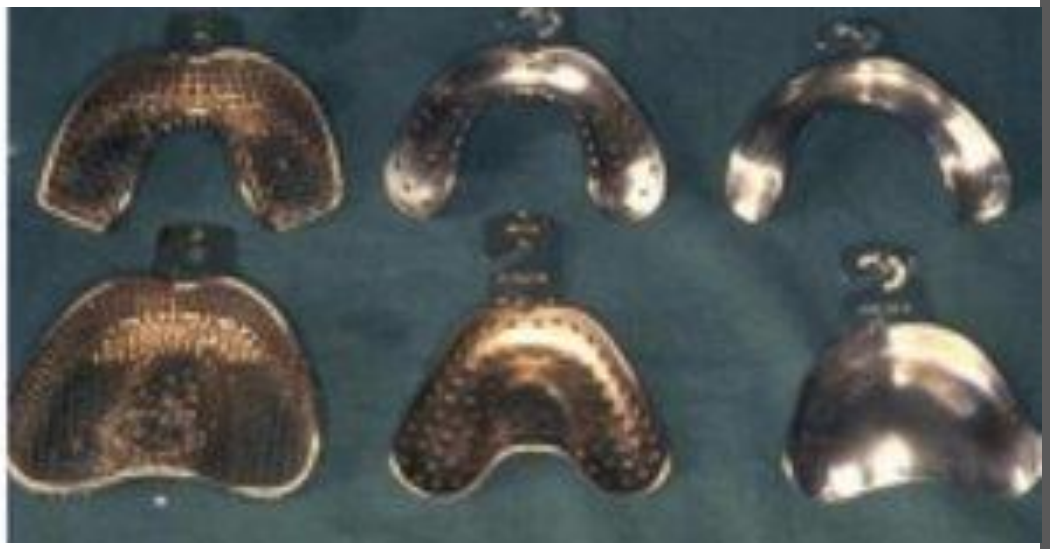
The TMJ resembles a hinge joint in which the upper and lower jaw have an arc relationship, which is how the articulator is similar to it.





Stock Trays Stock trays are either metal or plastic depending on the purpose of use. Trays that have curved “round” cross section are for edentulous patients, and trays that have square cross section are for dentate patients.





tray selection

- A tray with proper size that fits the jaw.
- Covers all required anatomical landmarks in the oral cavity.
- Has sufficient place for impression compound (6-8ml)

Impression compound

- They come in red-brown cakes that are placed in hot water baths.
- Thermoplastic material; it becomes moldable at 55 degrees celsius.
- If the temperature is too high, the plasticizer is removed and it becomes sticky.
- Kneed in vaseline.

Plaster of Paris (POP) has been used to take impressions before; because it can give greater detailed and more accurate replica for dentures.

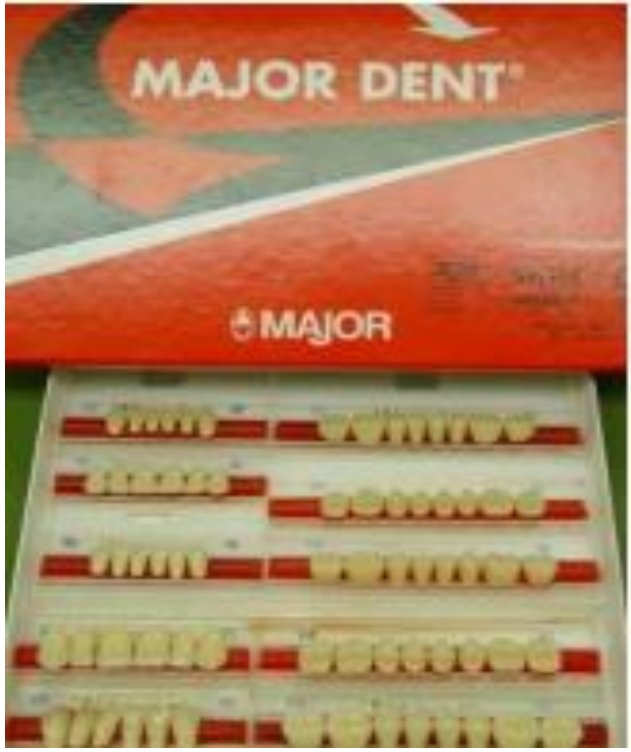
The disadvantages of POP:

i. tastes bad in the patient's mouth.

ii. ii. Brittle; it might break when it arrives to the technician and it’s hard on the oral tissue.

Impression material Artificial teeth are from acrylic usually or porcelain .

We place the teeth on wax in the patient's mouth to test if they fit, and then we take them to the lab for flasking to make a complete denture.



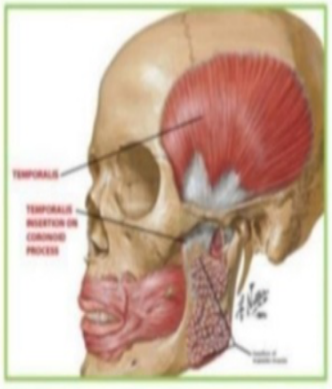
Oral Anatomy

Head and neck muscles, nerves and blood vessels are important to know when constructing a denture; specially intra-oral, peri-oral and mastication muscles.

Temporalis

Origin: Medial wall of the temporal fossa and temporal fascia

Insertion: Anterior margin of coronoid process and anterior border of the ramus of mandible



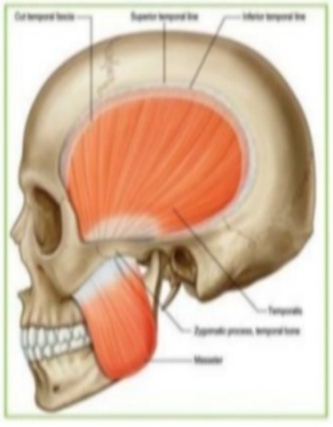
Masseter

Origin:

Lower margin & deep aspect of zygomatic arch

Insertion:

Lateral surface of ramus of mandible

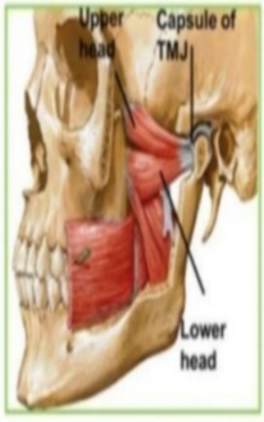


Lateral pterygoid

Origin:

1. Upper head: Infratemporal surface of greater wing of sphenoid
2. Lower head: Lateral surface of the lateral pterygoid plate

Insertion: Pterygoid fovea & capsule of TMJ.

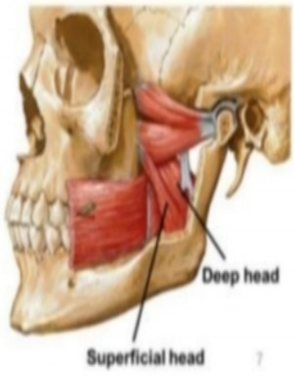


Medial pterygoid

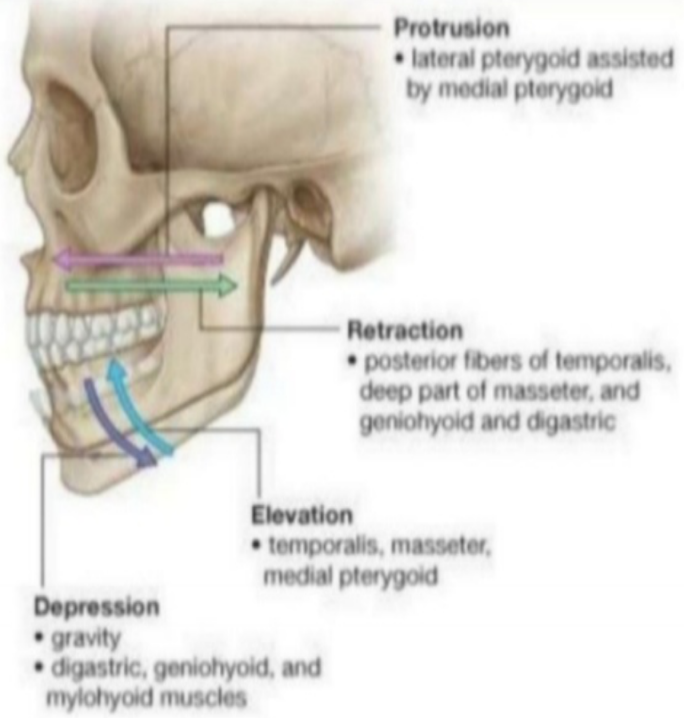
Origin:

1. Deep head: from the medial surface of lateral pterygoid plate
2. Superficial head: Tuberosity of maxilla

Insertion: inner surface of angle of mandible.



MOVEMENTS



PROTRUSION AND RETRACTION

Protrusion is brought about by simultaneous contraction of the lateral and medial pterygoids of both sides

While

Retraction is mainly due to contraction of the posterior horizontal fibres of temporalis muscle

*Supplied by mandibular division of trigeminal nerve
*All derived from 1st pharyngeal arch.