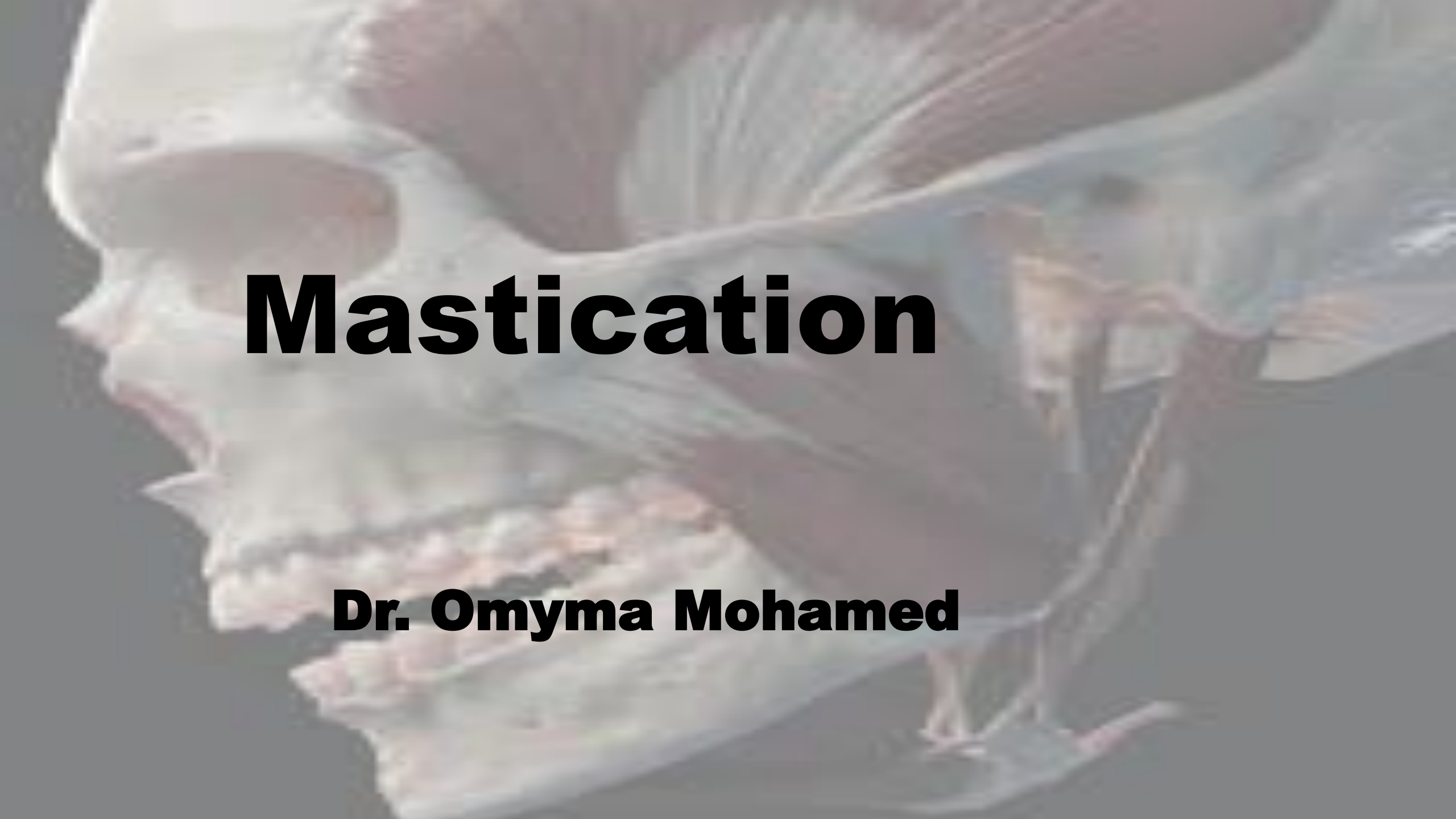
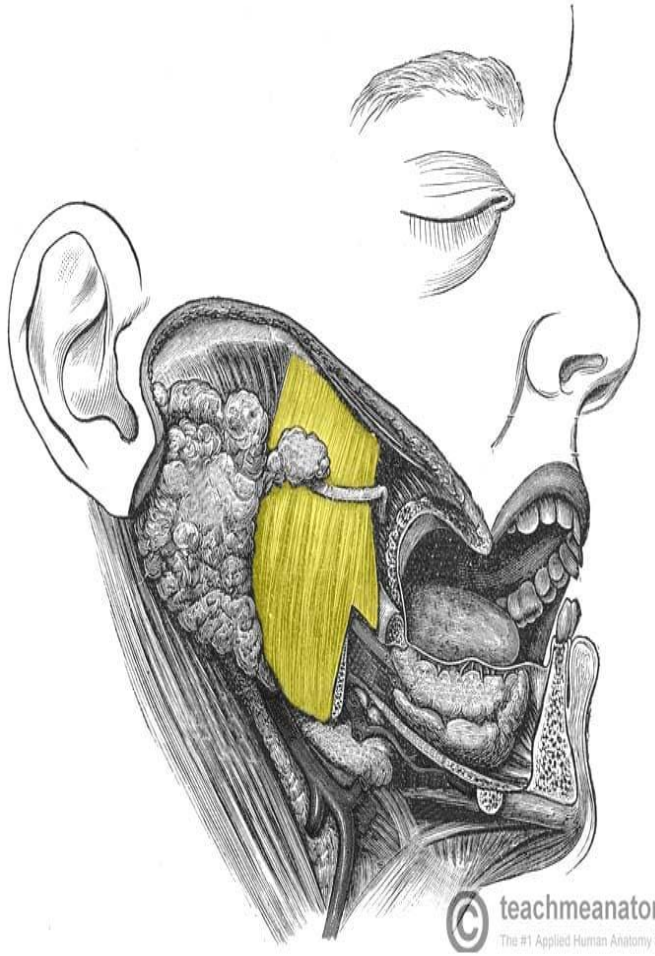


Mastication

Dr. Omyma Mohamed

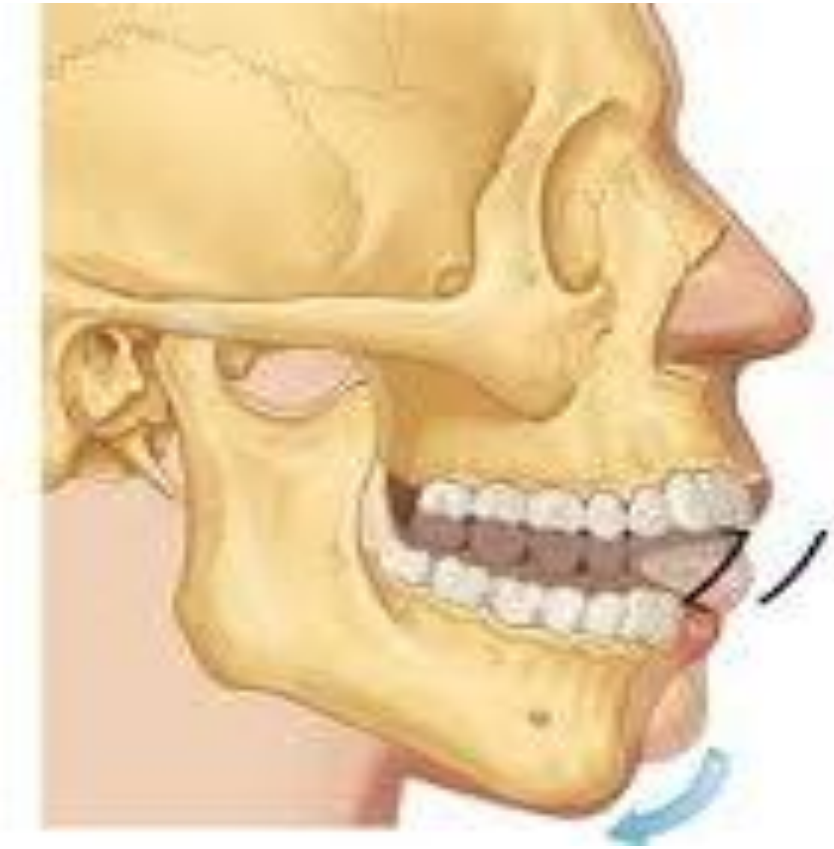
Mastication is.....

- the process of chewing food, breaking it down into smaller particles to prepare it for swallowing and digestion.
- It is the first step in digestion, involving the coordinated movement of the jaw, tongue, and cheek muscles to grind food with the teeth.
- This mechanical process is aided by saliva and is essential for proper digestion and nutrient absorption



Mastication: is a complex process involving movements of the body of the mandible in a vertical plane and laterally in a horizontal plane.

The teeth are approximated and separated together with the movements of the tongue, lips and cheeks to control the position and form of the food bolus.



INCISING

☐Protrusive movement:

- **Condylar heads sliding forwards & downwards onto articular eminence.**
- **Depression in protruded position.**
- **Hinge movement to elevate the body to edge-edge incisal position**

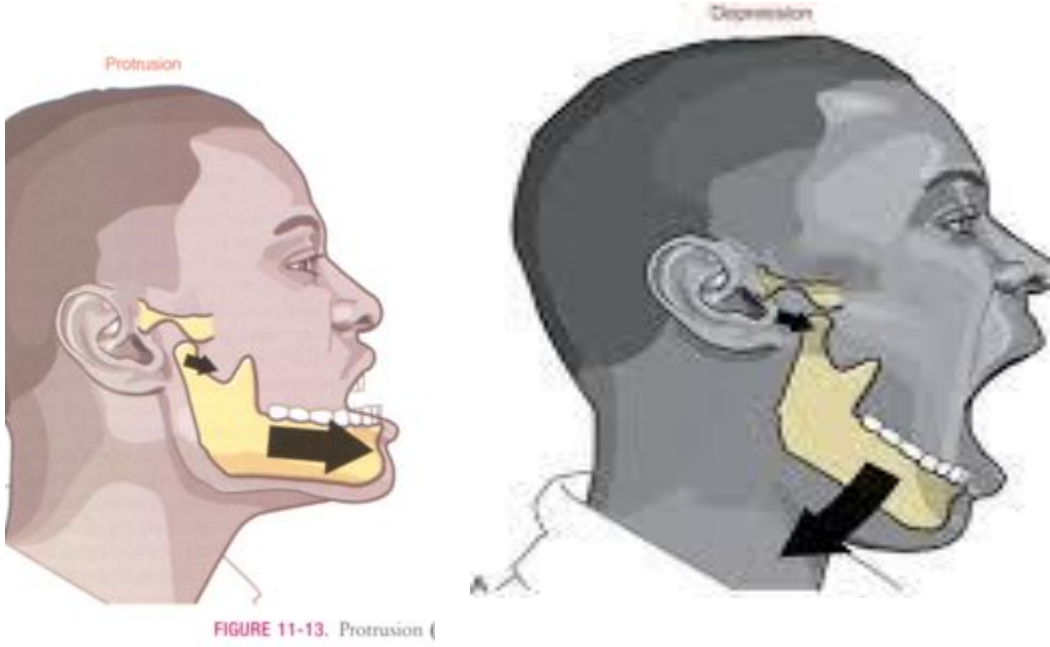
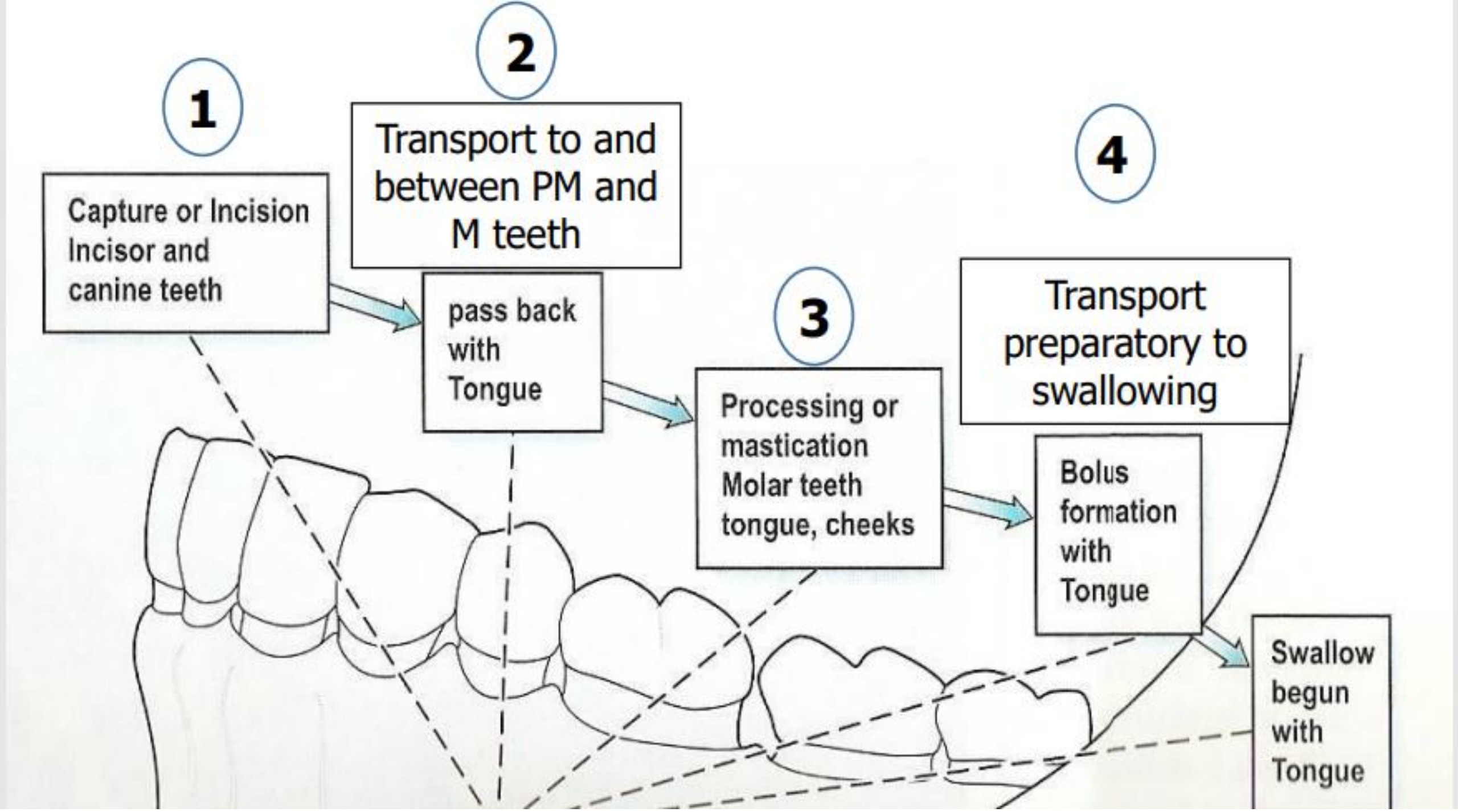
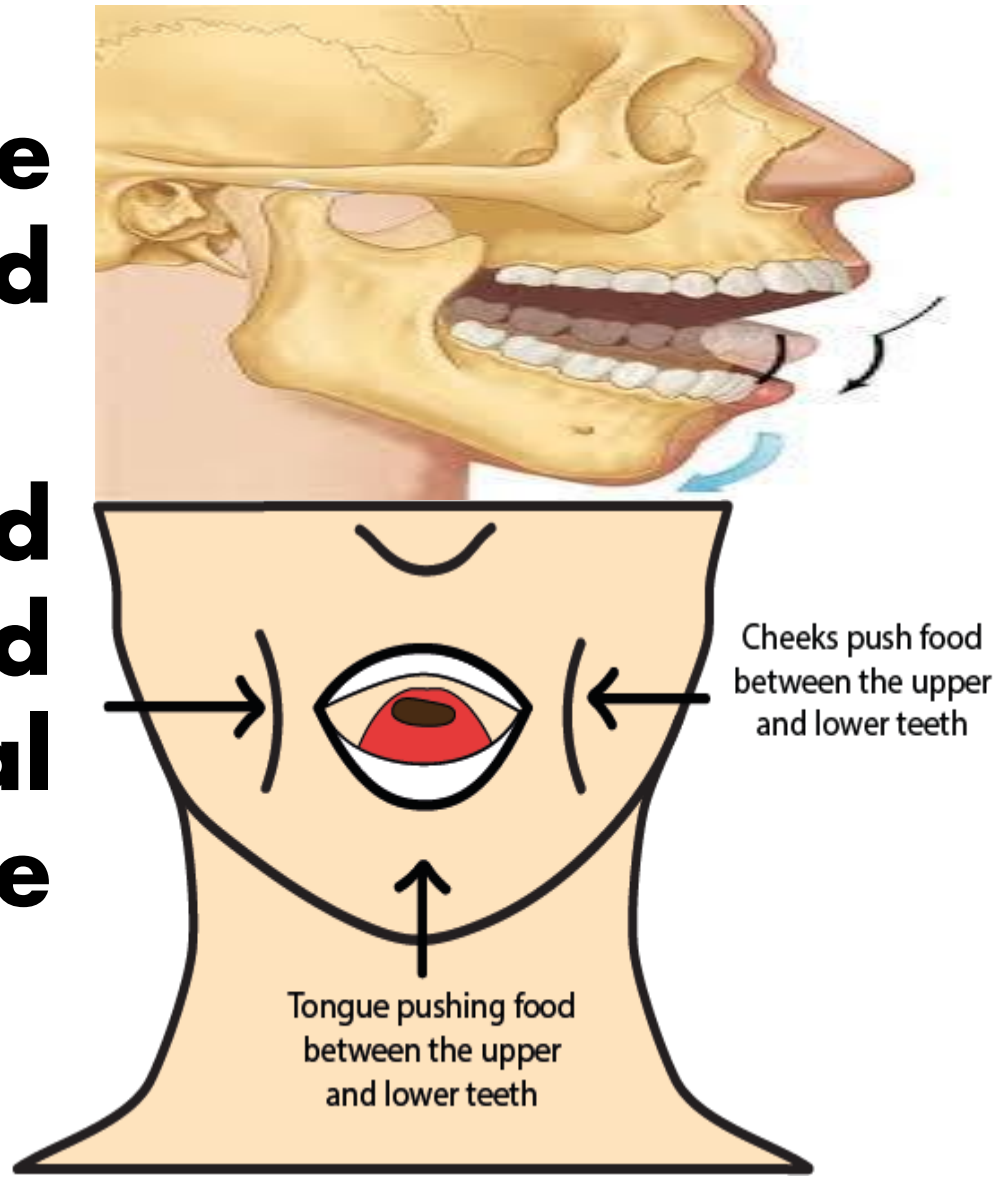


FIGURE 11-13. Protrusion (

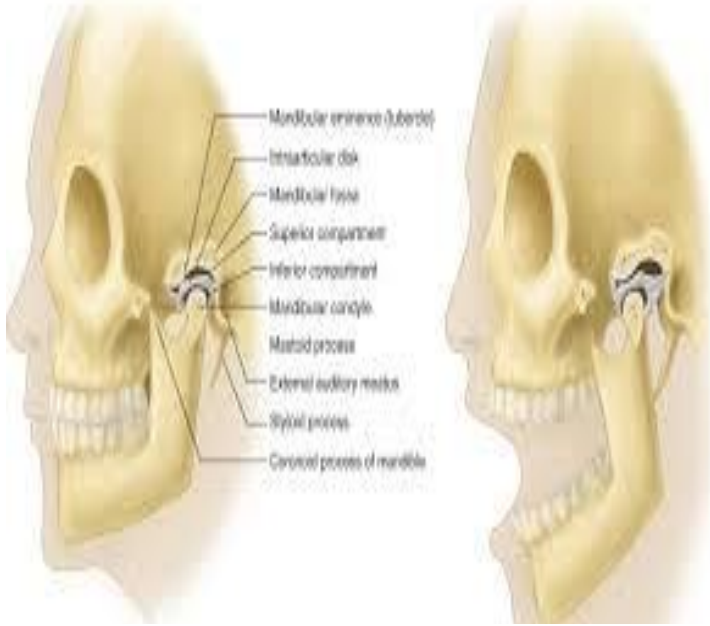

1
Capture or Incision
Incisor and
canine teeth
2
Transport to and
between PM and
M teeth
pass back
with
Tongue
3
Processing or
mastication
Molar teeth
tongue, cheeks
4
Transport
preparatory to
swallowing
Bolus
formation
with
Tongue
Swallow
begun
with
Tongue

Masticatory cycle

- **Opening Phase**: The mandible is depressed and the mouth opens.
- **The food is prepared and positioned by <u>the tongue</u> and <u>cheeks</u> between the occlusal surfaces of the teeth for the next phase.**

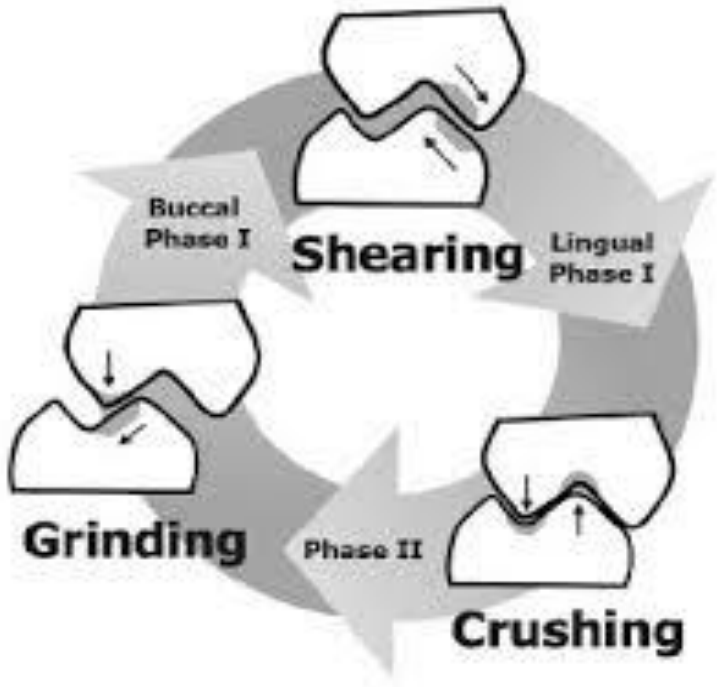


- **Closing Phase**: **The mandible is elevated back towards the maxilla. This phase can be further subdivided into two stages:**



  - **Crushing Phase: The initial part of closure where the food is trapped between the teeth, and initial force is applied.**

  - **Grinding Phase: As the teeth come closer, the cuspal inclines of the teeth slide across each other, causing the grinding of the food bolus.**
  - **The movement of the mandible is slower during this phase due to the resistance of the food.**



- **Occlusal/Inter-cuspal Phase:** The mandibular and maxillary teeth establish contact
- maximum force is applied to further reduce the food particles.
- This is the functional phase where most of the food reduction occurs.

factors determining the chewing result: (factors affect mastication)

1. the occlusal area where the food particles are fragmented. This fragmentation depends on the total occlusal area and thus on the number of teeth.
2. The muscular force which depends on muscle volume, jaw muscle activity, and the coordination between the various chewing muscles.
3. the movement of the jaw, and thus the neuromuscular control of chewing, plays an important role in the fragmentation of the food.
4. production of sufficient saliva
5. Taste and texture of the food

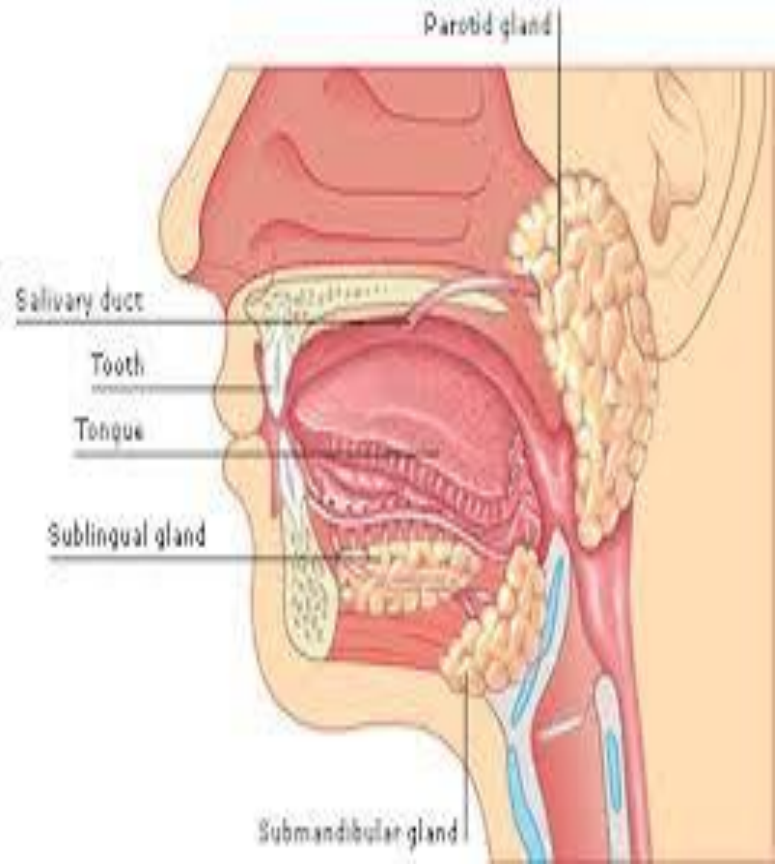
6. **Number of chewing cycles before swallowing**
7. **Nature of food.**
8. **Men > women.**
9. **Women > children**

✓**The bite force on molars is generally the highest in the mouth, with studies showing average forces around ~30 to 40 kg for adults,**

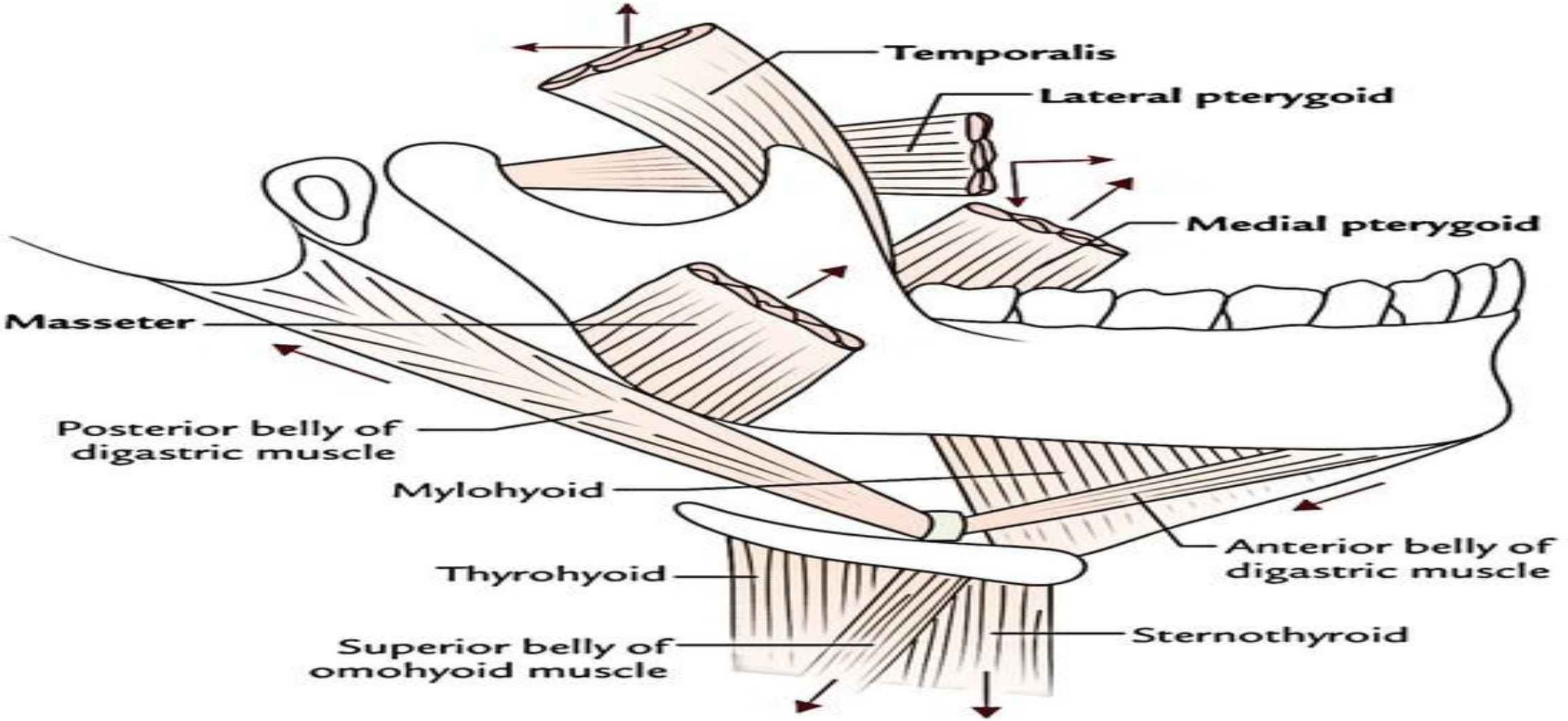
✓**Children's bite force varies by age, dentition, and gender**

Importance of mastication

1. **Reduces particle size**: Mastication physically grinds and crushes food into smaller pieces, increasing the surface area for digestive enzymes to work on.
2. **Forms a bolus**: It mixes the food particles with saliva to create a soft, cohesive mass (bolus) that is easier to swallow.
3. **Begins chemical digestion**: Saliva contains enzymes like amylase that begin the breakdown of starches while chewing.
4. Help in digestion of in-digested cellulose because human haven't cellulase, **by breaking cellulose down into small component.**
5. Stimulate taste receptors and smell receptors which **stimulate satiety center** in brain. This center is responsible for feeling full.
6. Taste receptors **stimulate stomach to secrete HCL** for digestion



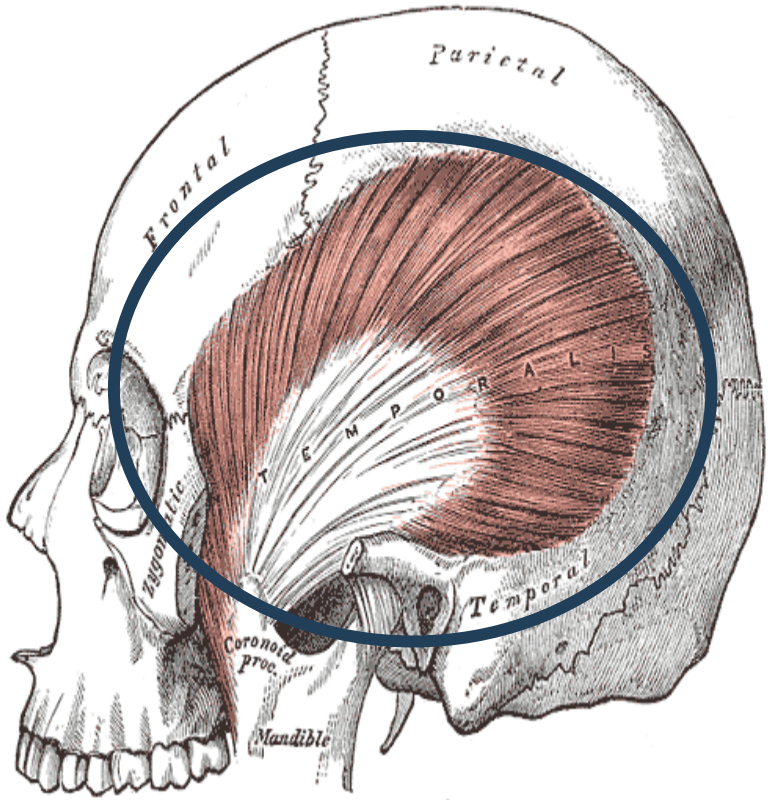
Primary Muscles of Mastication



- **Temporalis: A large, fan-shaped muscle that originates from the temporal bone and attaches to the mandible.**

- **Origin: the temporal fossa of the skull.**
  Insertion: coronoid process

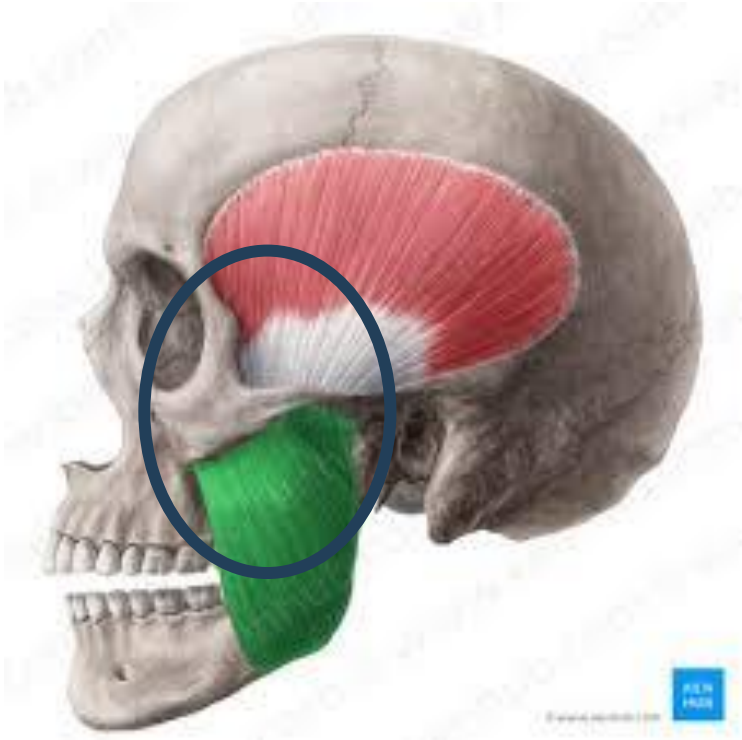
- **<u>It also elevates the mandible, contributing to jaw closure and biting.</u>**



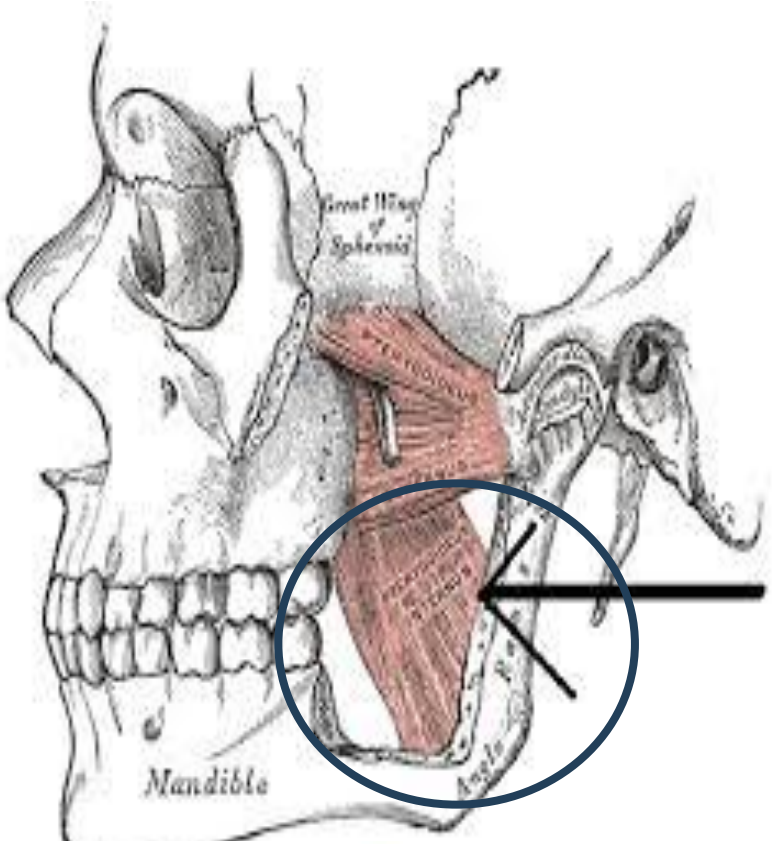
Masseter: This is the most powerful muscle of mastication, located on the side of the face and involved in elevating the mandible to close the jaw.

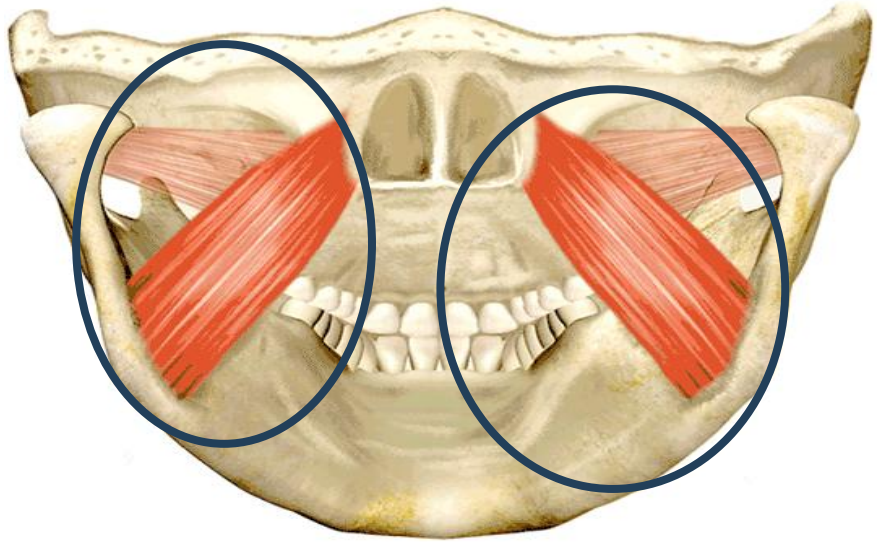
Origin: the zygomatic bone

Insertion: the ramus of the mandible

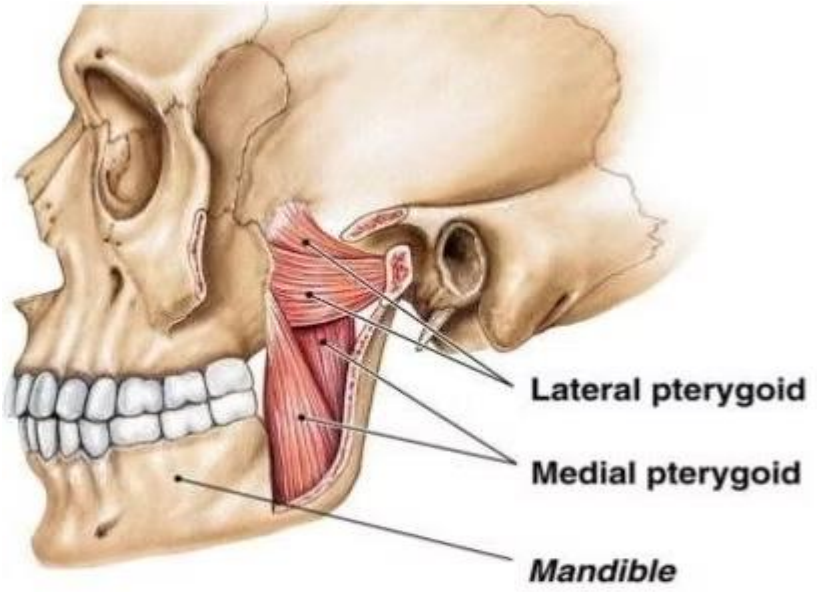


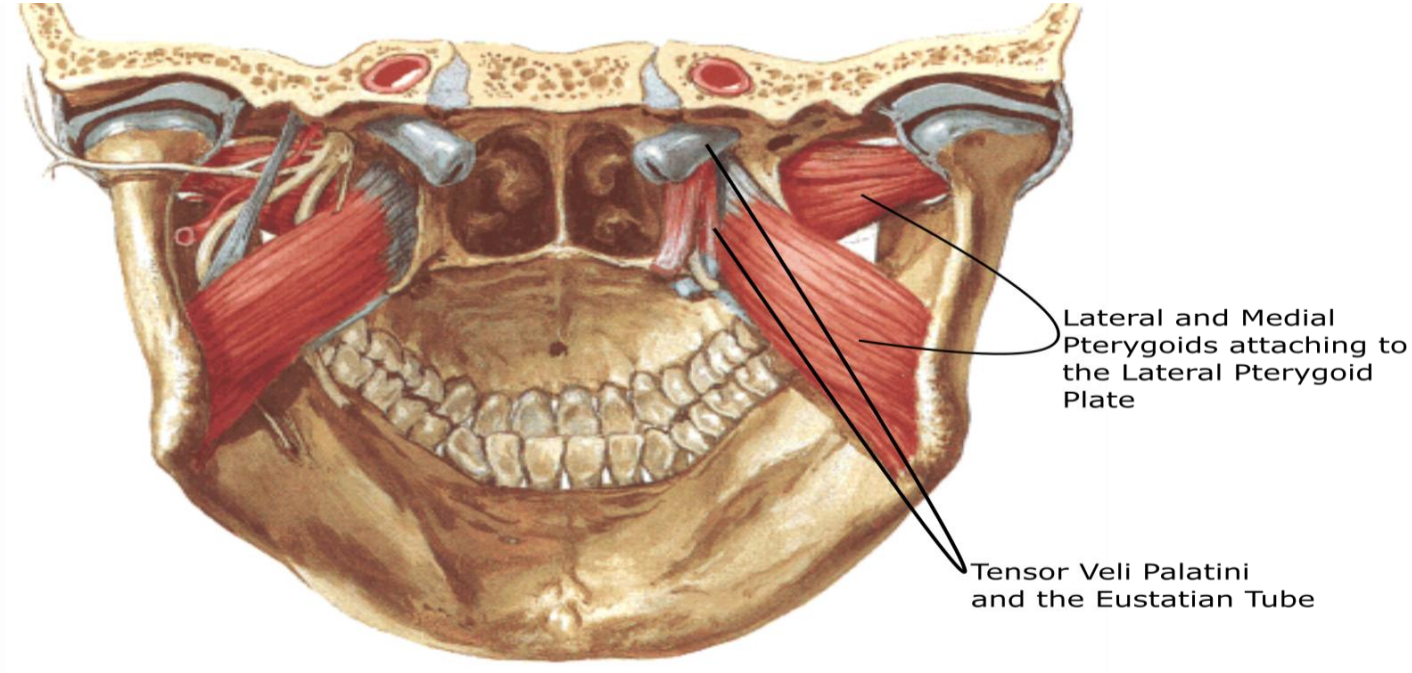
- **Medial Pterygoid: This muscle runs along the inner surface of the jaw.**
- **The medial pterygoid muscle functions to assist with elevation and protrusion of the mandible.**
- **It also assists the lateral pterygoid muscle with side to side mandibular motion to help with the grinding of food.**
- **Origin: the medial surface of the lateral pterygoid plate**
- **Insertion: the medial surface of the mandibular ramus, close to the angle of the mandible.**





- **Lateral Pterygoid: This muscle plays a crucial role in opening the mouth by depressing and protracting the mandible, as well as facilitating the side-to-side movements of the jaw needed for grinding food.**
- **Origin: lateral surface of the lateral pterygoid plate of the sphenoid bone.**
- **Insertion: a shallow depression on the anterior aspect of the neck of the mandible**

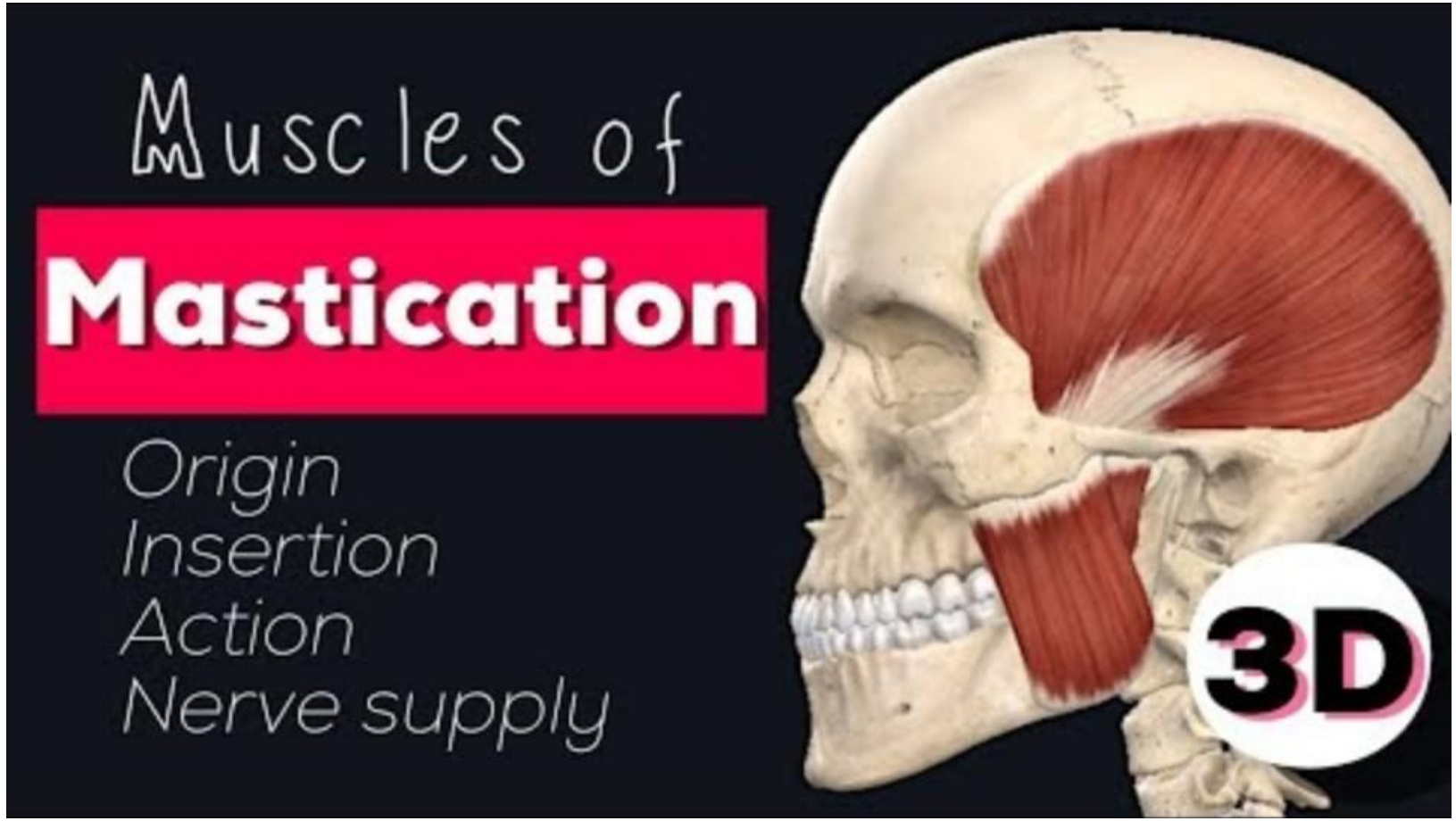




Function and Innervation

Function:

- **Elevation: Masseter, temporalis, and medial pterygoid.**
- **Depression: Primarily the lateral pterygoid.**
- **Protrusion: Lateral pterygoid.**
- **Retraction: Temporalis.**
- **Side-to-side movement: Lateral and medial pterygoids.**
- **Innervation: All four primary muscles of mastication are innervated by the mandibular branch of the trigeminal nerve (CN V).**


Muscles of
Mastication
Origin
Insertion
Action
Nerve supply
3D


Thank
you