Mastication

Dr. Omyma Mohamed

3 phases
إي بالنص داخلها مرحلتين

إرادية و لا إرادية

Mastication is.....

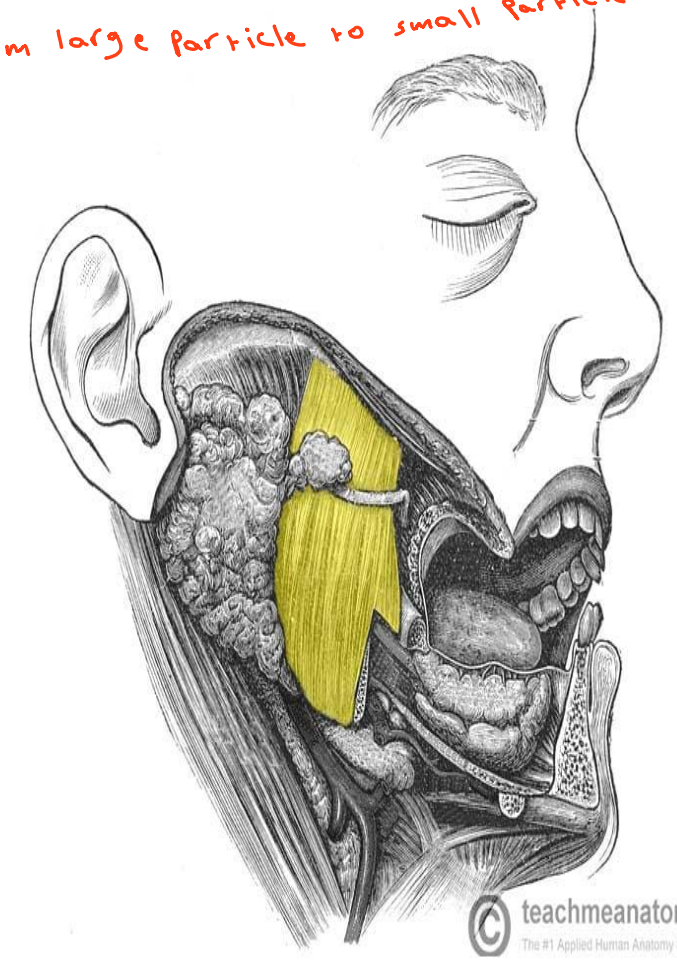
↳ mechanical process

def

- 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

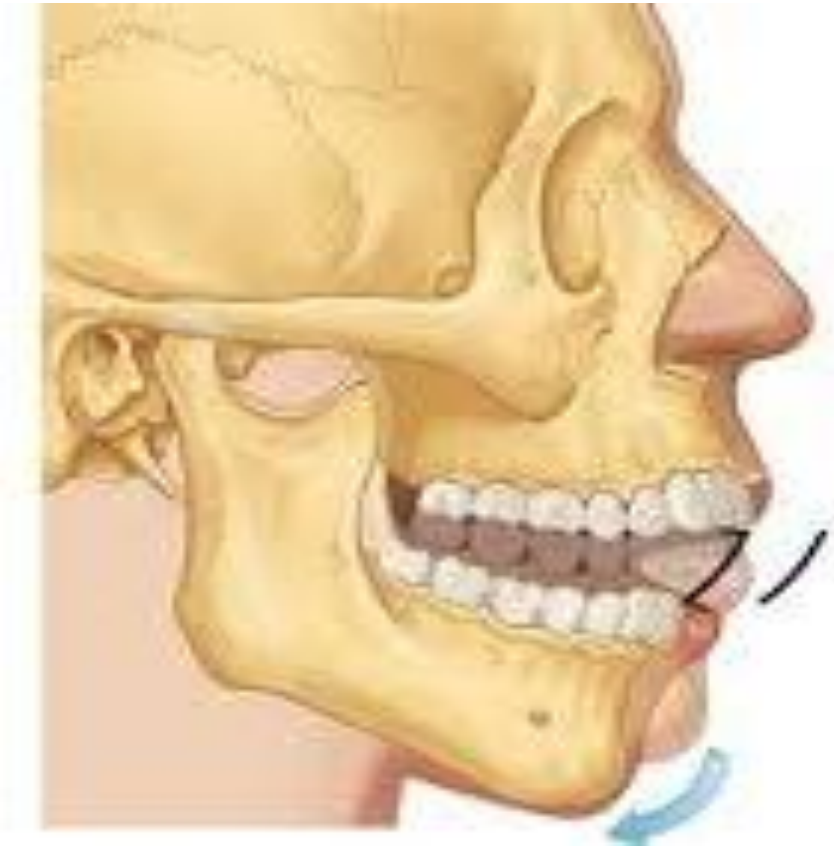
(food)

from large particle to small particle.



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

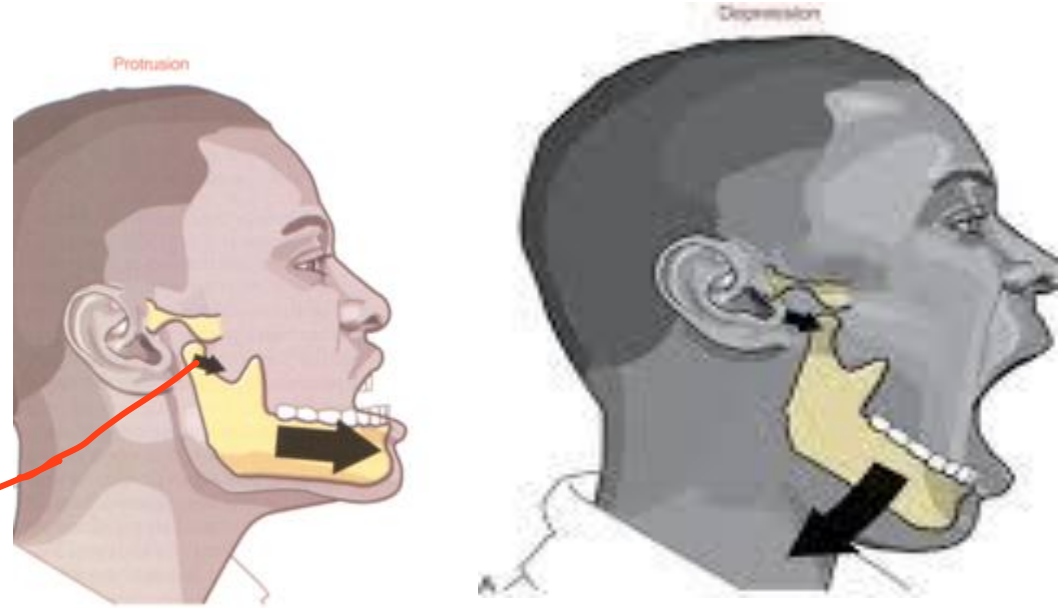
The teeth are approximated and separated together with the movements of the tongue, lips and cheeks to control the position and form of the food bolus.



INCISING

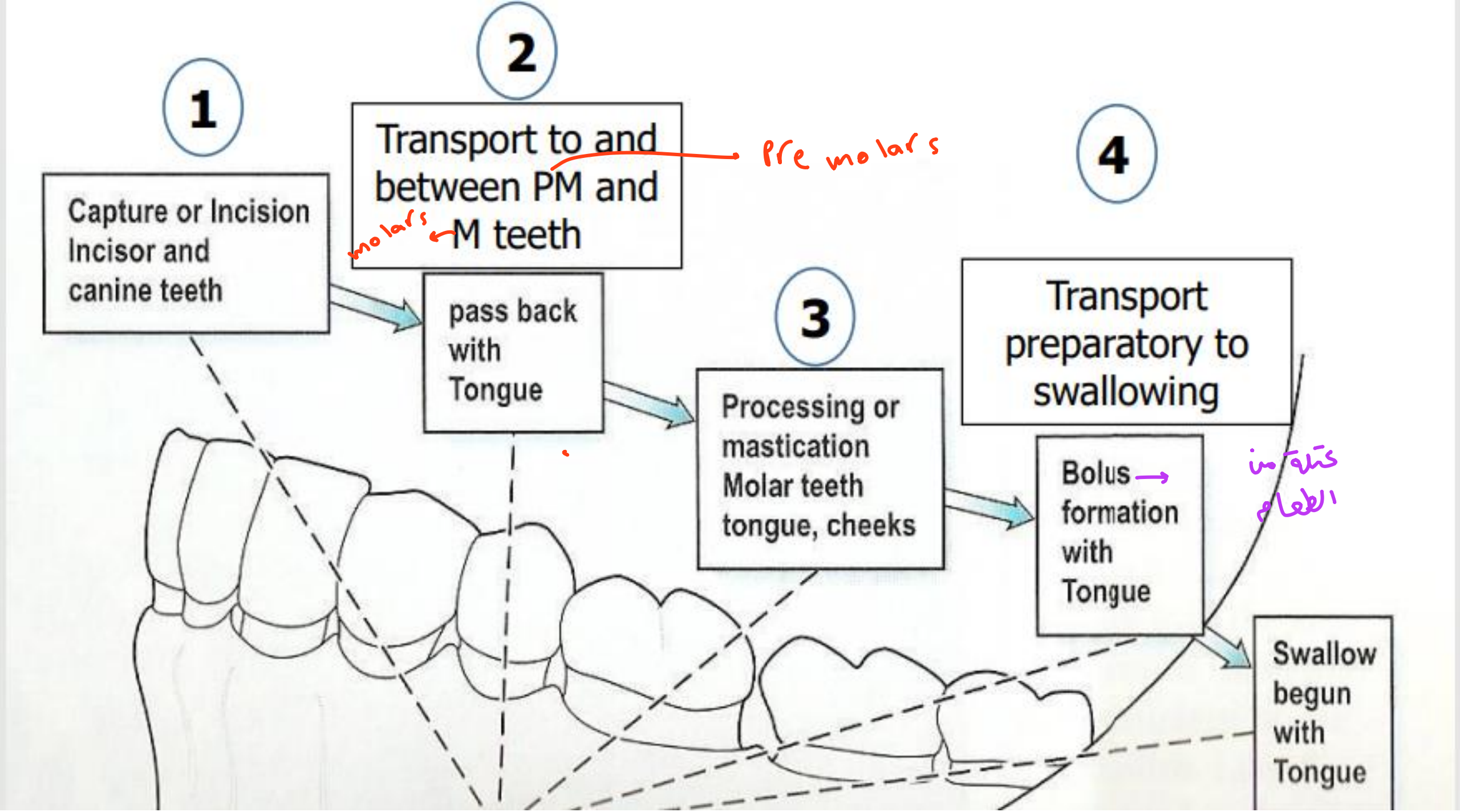
☐**Protrusive movement:**

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



condylar process.

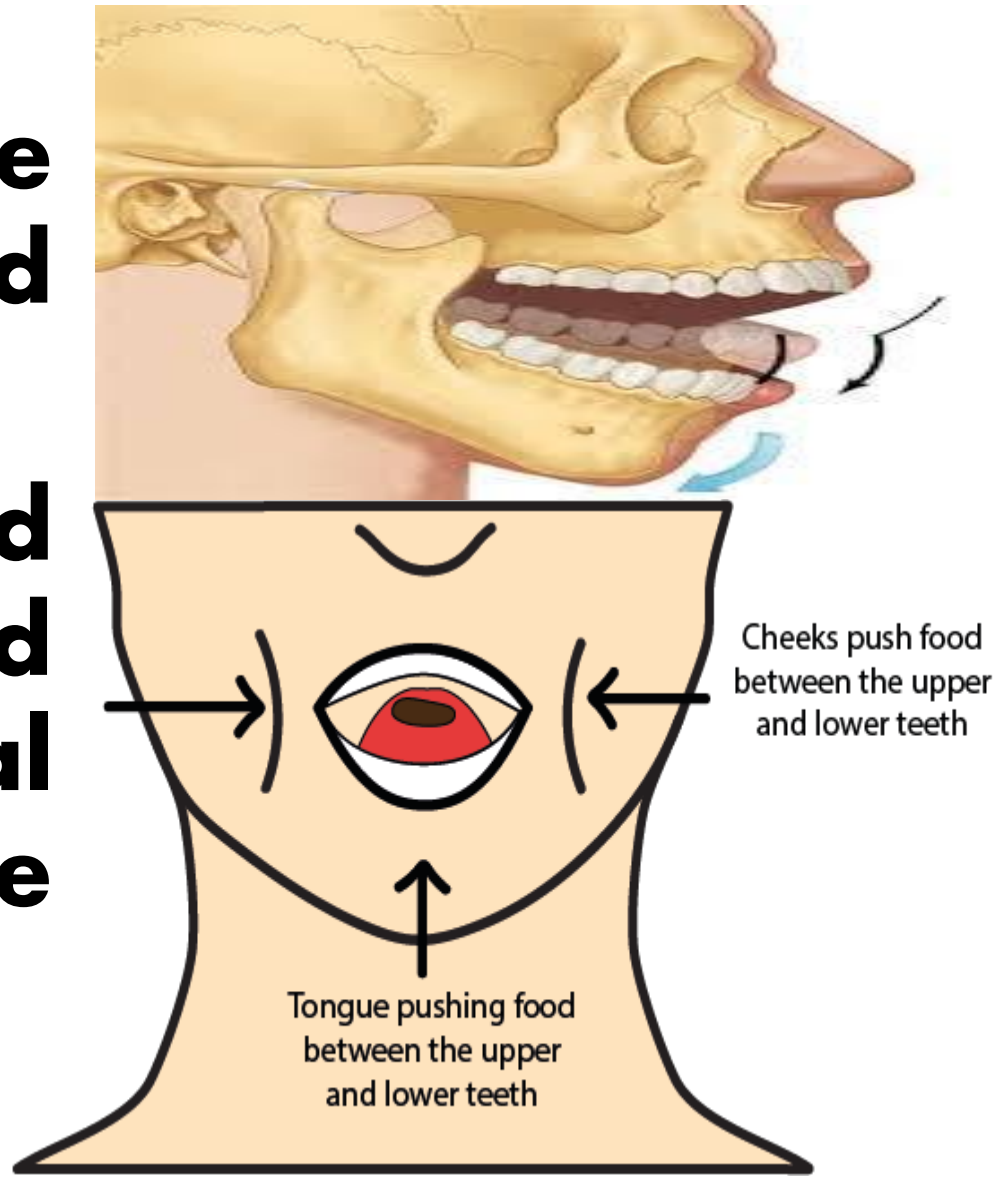
FIGURE 11-13. Protrusion (


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

Masticatory cycle

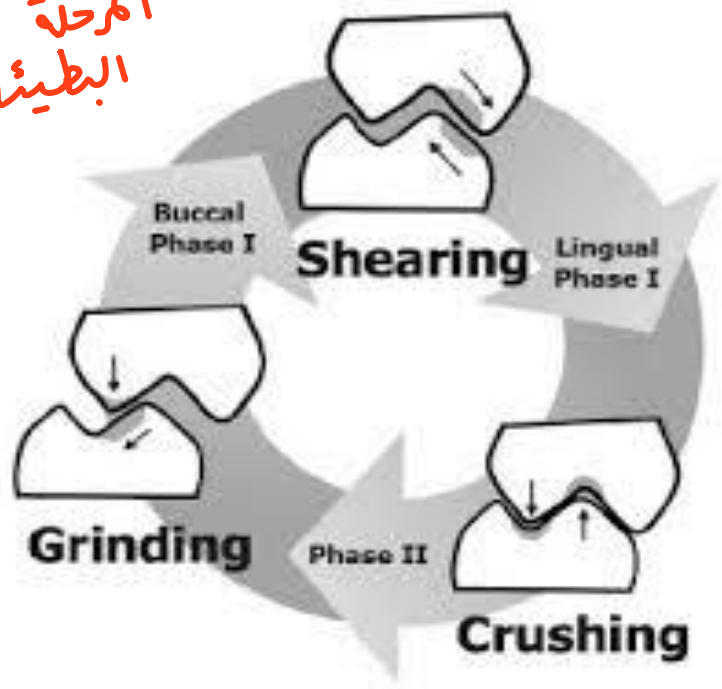
muscles relaxation.

- **Opening Phase**: The mandible is depressed and the mouth opens.
- **The food is prepared and positioned by the tongue and cheeks 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.



آخر → Functional Phase.

- **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

مرض عضلات يستمر عليه فترة ثم تنهي. ← muscl relaxation

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

المشكلة في : أم العضلات / TMJ بسبب سن العقل
عندما تضع يدك على الـ condylar process وتحركه افتح فمك أكثر شيء ومايقف/ويتألم هنا

- ✓ **The bite force on molars is generally the highest in the mouth, with studies showing average forces around ~30 to 40 kg for adults,** حفظ
- ✓ **Children's bite force varies by age, dentition, and gender**

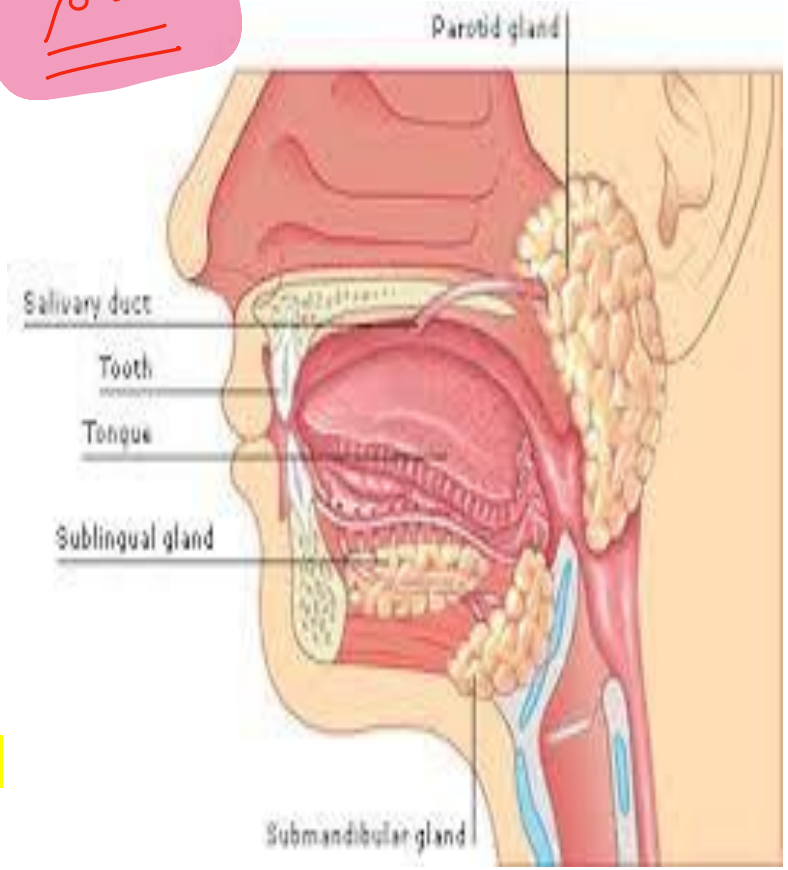
في الـ adult يتحمل 40kg

Importance of mastication

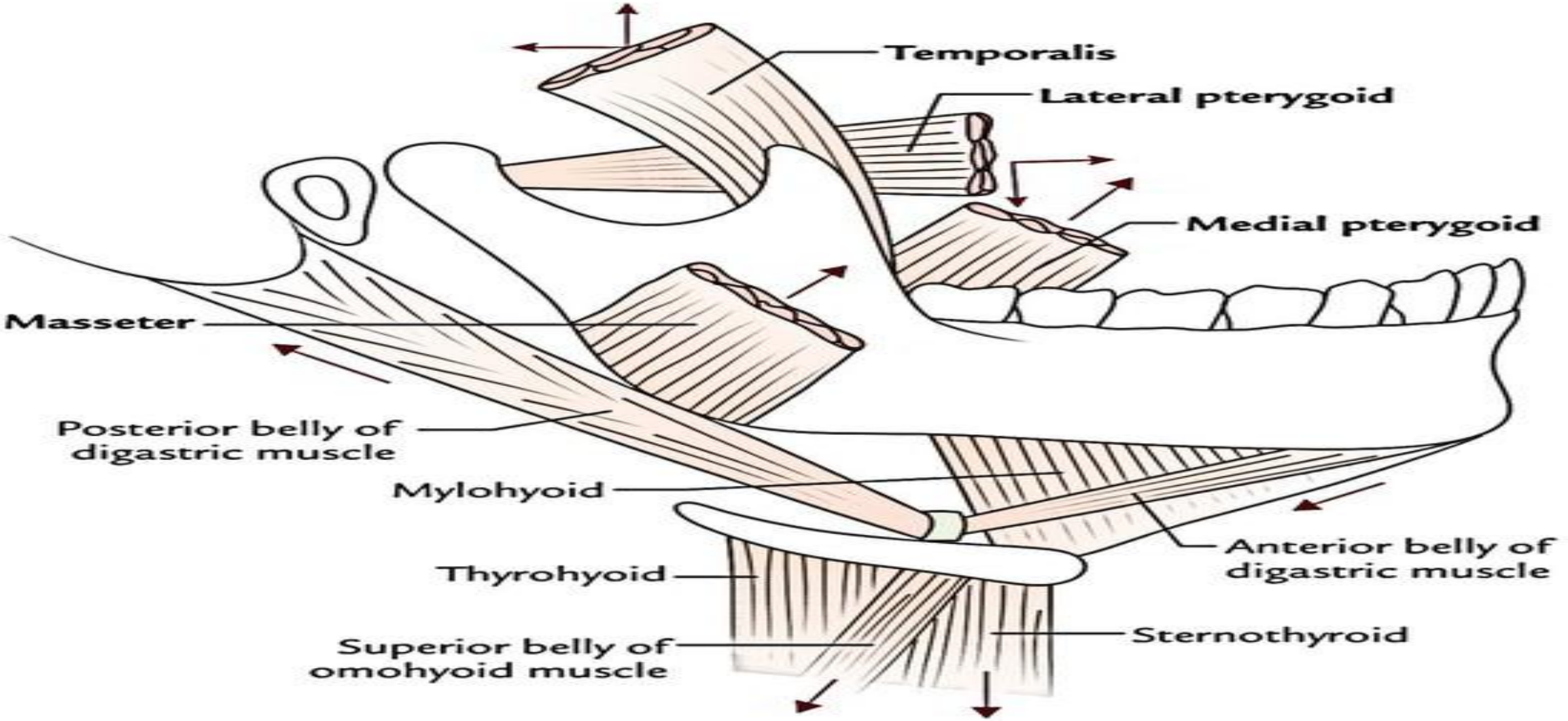
مهم

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.
   مغلفة بال saliva
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.
   مركز الشبع
6. Taste receptors **stimulate stomach to secrete HCL** for digestion

بالتالي المعنى بساعد بالهضم (digestion)



Primary Muscles of Mastication

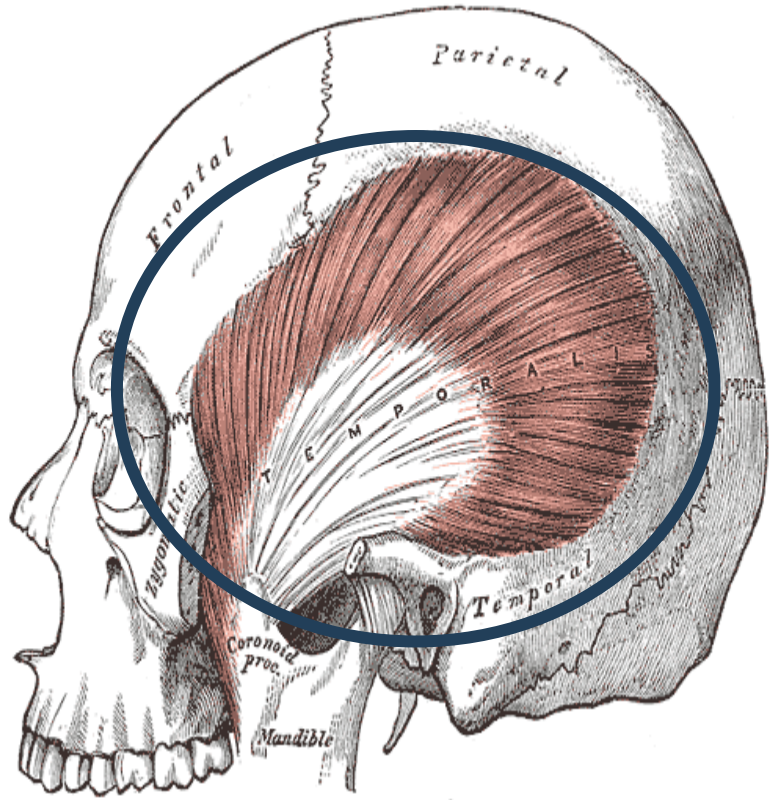


ال temporalis و ال masseter هم اللي معلقين ال mandible بال maxilla

- **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

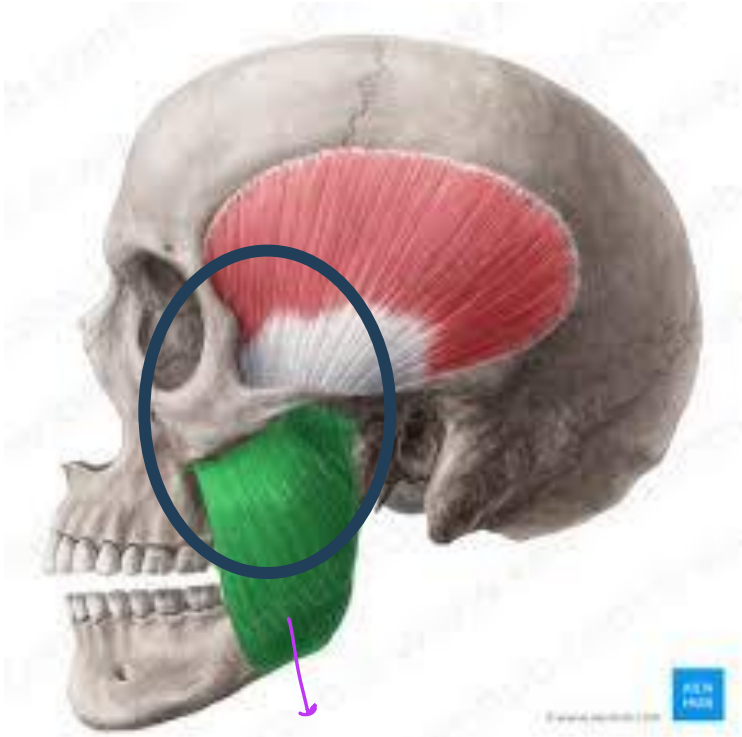
- **It also elevates the mandible, contributing to jaw closure and biting.**



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.

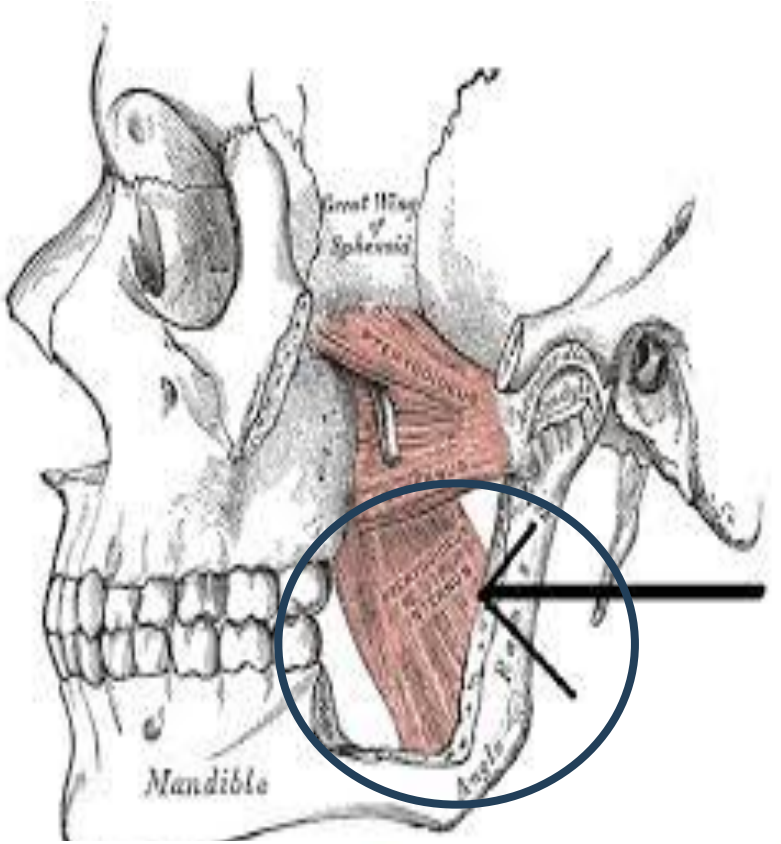
Origin: the zygomatic bone

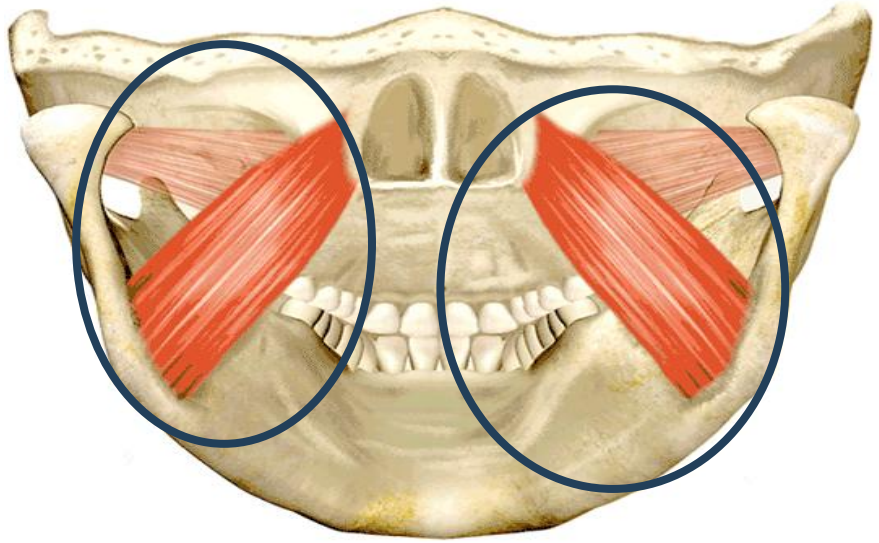
Insertion: the ramus of the mandible



masseter ← هي اللي بتلقى الضربة (الصفعة) على الوجه

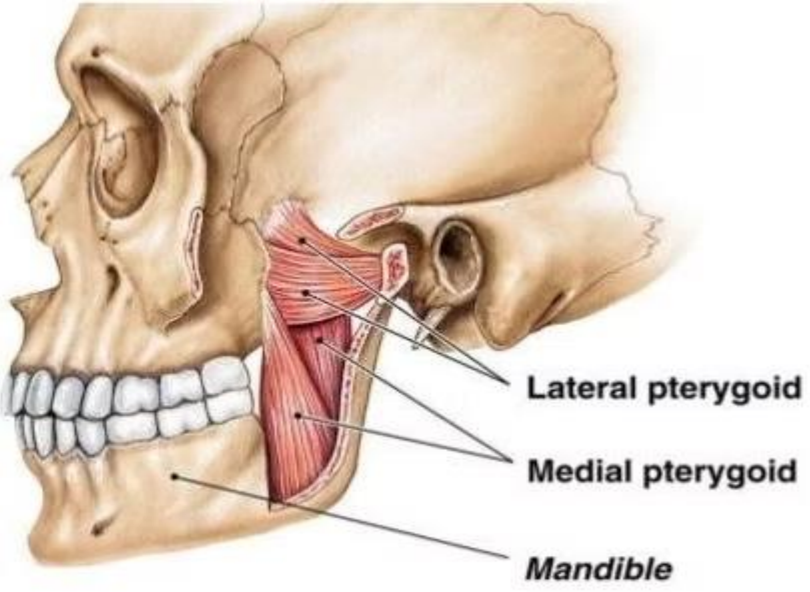
- **Medial Pterygoid**: This muscle runs along the inner surface of the jaw.
- The medial pterygoid muscle functions to assist with elevation and protrusion of the mandible.
- It also assists the lateral pterygoid muscle with side to side mandibular motion to help with the grinding of food.
- **Origin**: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

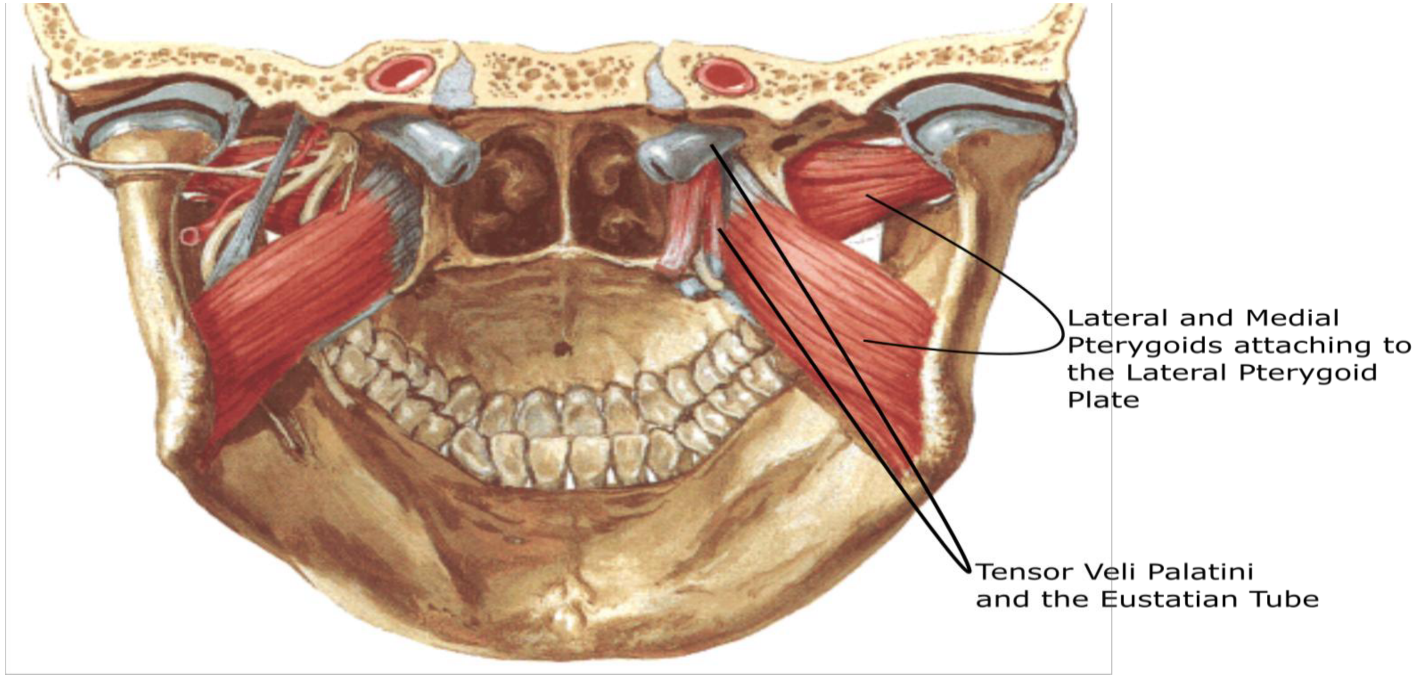




هي الأساسية والـ medial Pterygoid بتساعدها.

- **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

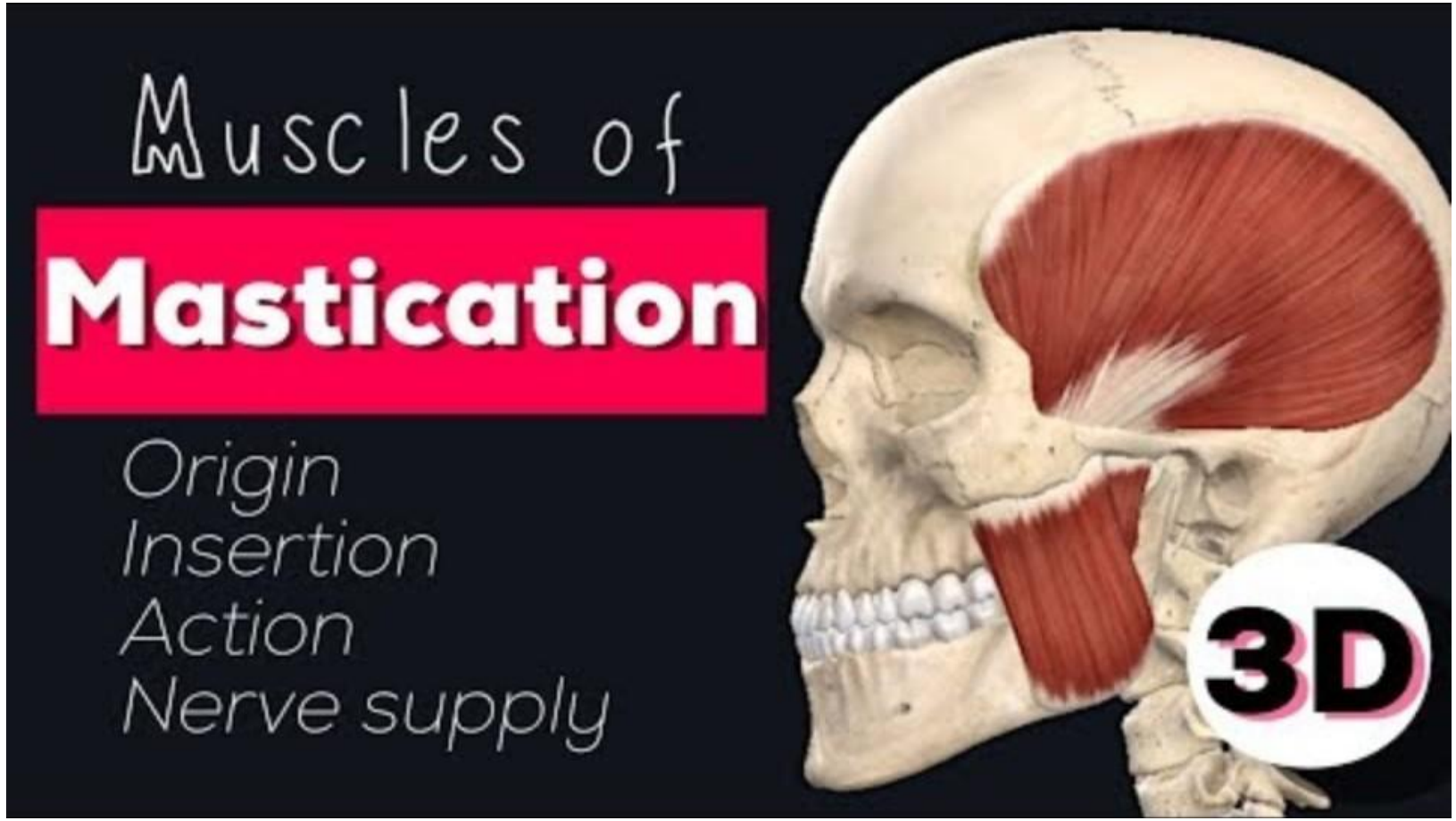




Function and Innervation

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