Temporomandibular Joint (TMJ)

One of the most frequently used joints in the body
Objectives

- Identify bones related to the temporomandibular joint
- Identify the motions that occur at the TMJ
- Cite the muscular interactions involved with closing and opening the mouth
1) Sagittal view of normal temporo-mandibular joint. Sliding joint type used in:
- Chewing
- Swallowing
- Talking

2) Inflammation of the TMJ can cause:
- Headache pain
- Ear pain and pressure
- Ringing in the ears
- TMJ catching or locking
- Change in bite
- Neck, shoulder and upper back pain
TMJ Functions

- Chewing
- Swallowing
- Yawning
- Talking
- Anything involving the jaw!
Joint Structure & Motions

Made up of:

- 2 bones,
- a disc that divides the joint into 2 joint spaces,
- a joint capsule,
- 4 ligaments,
- 4 main muscles that create 5 motions.
Motions:

- Mandibular depression
- Mandibular elevation
- Mandibular lateral deviation
- Mandibular protrusion or protraction
- Mandibular retrusion or retraction
Resting position of the mandible:

- The condyle of the mandible is seated in the mandibular fossa of the temporal bone.
- The lips would be closed and teeth would be several millimeters apart.
Resting position of the mandible:

- This would be maintained by low levels of activity of the temporalis muscles.
- You should be able to open your mouth enough to fit 2-3 finger widths between the front upper and lower teeth.
Bones that make up the TMJ

(External auditory meatus)
The Mandible
The Mandible

- One bone, rests dependent upon muscle relaxation and forms 2 identical joints with a temporal bone on either side of the face
- Makes up the inferior part of the face
  - The “jaw”
  - Bony landmarks
Ligaments & Other Structures

- Numerous ligaments suspend and/or limit excessive motion of the mandible.
Ligaments & Other Structures
The articular disc divides the joint space into upper and lower spaces.

The movement of the disc is often the source of “clicking” that can be heard or felt by patients.

It may _or may not be_ a sign of pathology.
• During opening of the mouth, the condyles of the mandible move forward along the articular disc.

• This is a smooth movement unless the opening is excessive.

• Repeated excessive opening can cause trauma to the area and potential disc injury.
Muscles of the TMJ

- Temporalis
- Masseter
- Medial & Lateral Pterygoids
  - Muscle Names, Locations, Actions are the goal!
Please identify the following muscle on yourself: Temporalis

Action:

Bilateral: elevation of the mandible (closing the mouth), retrusion of the mandible; and
Retrusion of the mandible

Unilateral: lateral excursion (to the ipsilateral side)
Please identify the following muscle on yourself: Masseter

Action:

Bilateral: elevation of the mandible (closing the mouth)

Unilateral: lateral excursion to the ipsilateral side
Please identify the following muscle on yourself: Medial Pterygoid

Action:
Bilateral: elevation of the mandible (closing the mouth)

Unilateral: lateral excursion to contralateral side
Please identify the following muscle on yourself: Lateral Pterygoid

Action:
Bilateral: depression of the mandible opening the mouth, Protrusion of the mandible
Unilateral: lateral excursion to the contralateral side
What do I need to know?

- You should be able to palpate the masseter and the temporalis on a classmate.
What do I need to know?

- You should also be able to determine whether or not there is any asymmetry in the TMJ upon opening or closing when observing a classmate.
What do I need to know?

- You also need to be able to locate all of the muscles and bony landmarks identified, including the external auditory meatus.
Facial Anatomy

Yes, you do need to know the bones and muscles of the face!
Bones of the Skull

- Mandible
- Occiput
- Temporal bones
- Parietal bones
- Frontal bones
- Maxilla bones
Structures

- Orbits
- Mastoid processes
- Supraorbital foramen
- Temporomandibular joint
Muscles of Mastication
Muscles of Mastication

- Temporalis
- Masseter
- Medial Pterygoid
- Lateral Pterygoid
Muscles of Facial Expression
Muscles of Facial Expression

- **Frontalis**
  - Elevates eyebrows
  - Wrinkles forehead

- Innervation
  - Temporal branch of Facial nerve
Muscles of Facial Expression

- Orbicularis Oculi
  - Closes and squints eyes
  - Innervation
    - Temporal and Zygomatic branch of Facial nerve
Muscles of Facial Expression

- Orbicularis Oris
  - Closes and purses lips (kissing muscle)
  - Innervation
    - Mandibular branch
    - Of facial nerve
Muscles of Facial Expression

- Zygomaticus Muscles
  - Elevates corners of mouth; (smiling muscle)
  - Innervation
    - Buccal branches of Facial nerve
Muscles of Facial Expression

- **Buccinator**
  - Compression of the cheeks (against the teeth)
  - Innervation
    - Buccal branch of the facial nerve
Muscles of Facial Expression

- **Levator Labii Superioris**
  - Elevates upper lip
  - Innervation
    - Buccal branches of Facial nerve
Muscles of Facial Expression

- Depressor Labii Inferioris
  - Depresses lower lip
  - Innervation
    - Buccal branches of Facial nerve
Muscles of Facial Expression

- **Nasalis**
  - Open and close nostrils
  - Innervation
    - Buccal branch of facial nerve
Muscles of Facial Expression

- **Platysma**
  - Draws mouth downward (pouting)
  - Innervation
    - Cervical branch of Facial nerve
So, what muscles are being used?
Special Expressions

- How many of you have “special skills?”
  - Can you wiggle your nose?
  - Can you move your ears?
  - Can you move your hairline?

  - All of these motions require the use of muscles that you do have, but may not know how to activate.
Ankle

- Origins, insertions, actions, innervations of all
- Describe position of ankle via pictures
- Types of ankle sprains and ligaments involved
- Names of joints at ankle and what motions occur there
- Muscle names by groups, i.e. Post Superficial
- **TMJ**
  - Location of palpable muscles
  - Bony landmarks of mandible
  - Normative values of mandibular motions
  - Motions occurring at TMJ
  - Relevance of disc
Ventilation
- Muscles of inspiration and expiration
  - Quiet and forced (accessory)
- Origin, Insertion, Action, Innervation of diaphragm, scalenes, and intercostals

Facial
- Names of muscles and actions