Head, Neck, & Jaw

Day 1

- Review the relevant anatomy for the neck, head, and jaw and learn to assess client alignment
- Observe and practice treatment techniques for the posterior neck in side lying & prone positions

Why Neck & Head Alignment Matters

- **When properly aligned, the neck and head float freely in gravity requiring far less muscular effort to hold head up**
- **When the head isn't balancing well in gravity, the larger muscles such as traps and SCM overwork and restrict shoulder ROM**
- **Tighter neck and shoulder muscles feed upwards into the head and jaw and downwards into the ribcage causing headaches, jaw clenching and TMJ, shoulder issues, and breathing issues**
- **Over time a head forward posture develops potentially resulting in cervical disc compression, herniation, nerve impingement and other more serious issues**

What is An Ideal Balance?

- **Ideally, the skull rests easily on the AO joint with eyes on the horizon line and the AO joint is aligned on a plumb line with the shoulder joint, body of T12, hip joint, knee joint, and ankle joints**
- **When aligned this way, neck muscles can soften and be used mostly for movement as opposed to for postural support**
- **With the neck muscles relaxed, the head and jaw muscles can also soften and be open for movement and expression without being recruited for postural support**

The Eyes Follow, the Head Follows, the Spine Follows

- **Our postural nervous system is innately connected to our eyes**
- **Our head will track and move towards wherever our eyes are looking**
- **This tracking leads down the spine and will pull on the entire rest of the body to pull in that direction**
- **For example, cats use this to “always land on their feet” - they find the floor with their eyes which pulls their head towards it, spinning the spine until their feet follow and line with their head**
  (it’s more complex than this but starts with the eyes “spotting” where they are going to land)

Proprioception Exercise

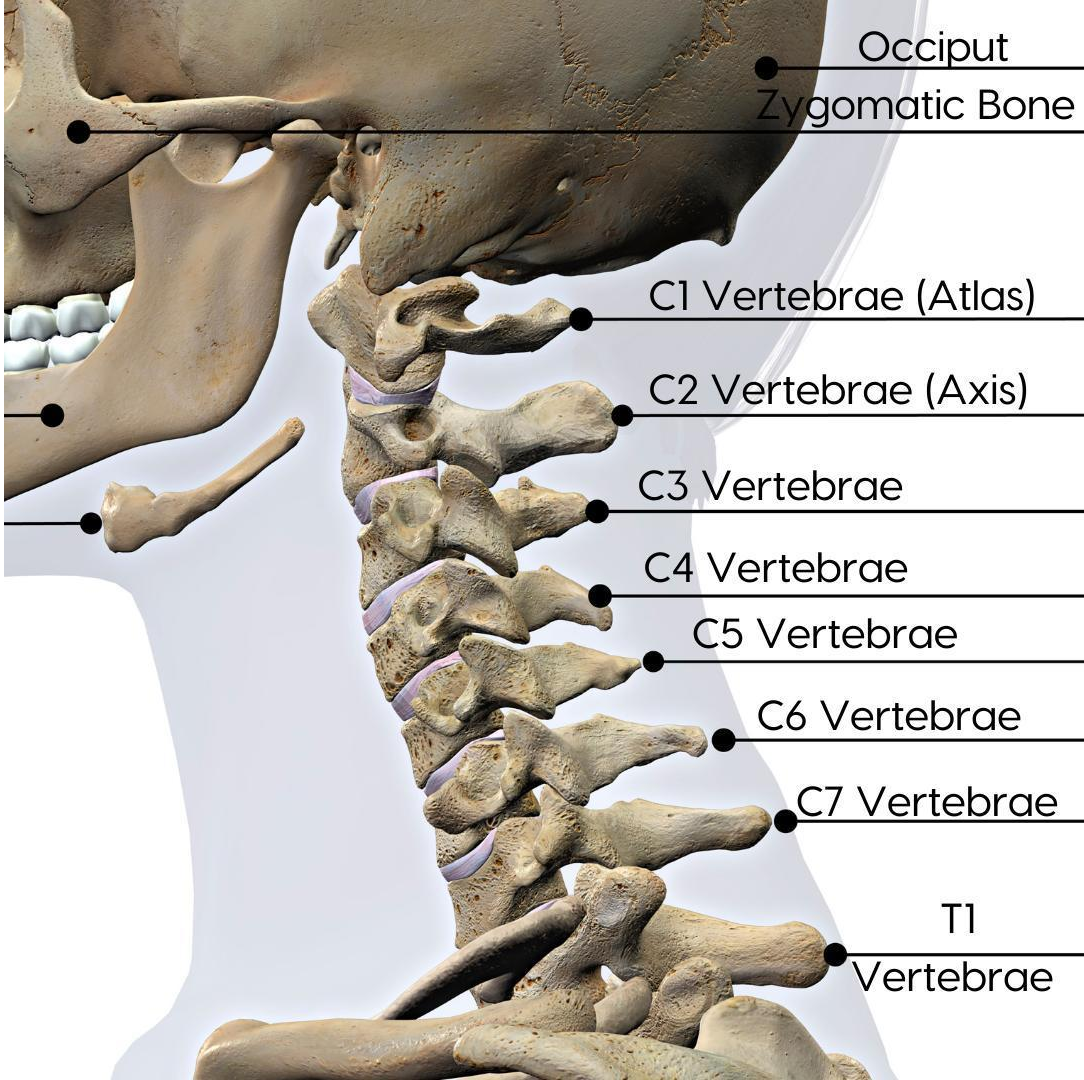
- **Try standing up as relaxed as possible and sight a point on the wall straight in front of you**
- **Quickly look to the left or right and see that your head will follow along by a few degrees as a reflex without your conscious effort**
- **Don’t try to resist the head movement or create it**
- **You may not get it right away which may indicate that you can’t easily balance your head in gravity and that the hands on work we do later will be highly beneficial for you :)**

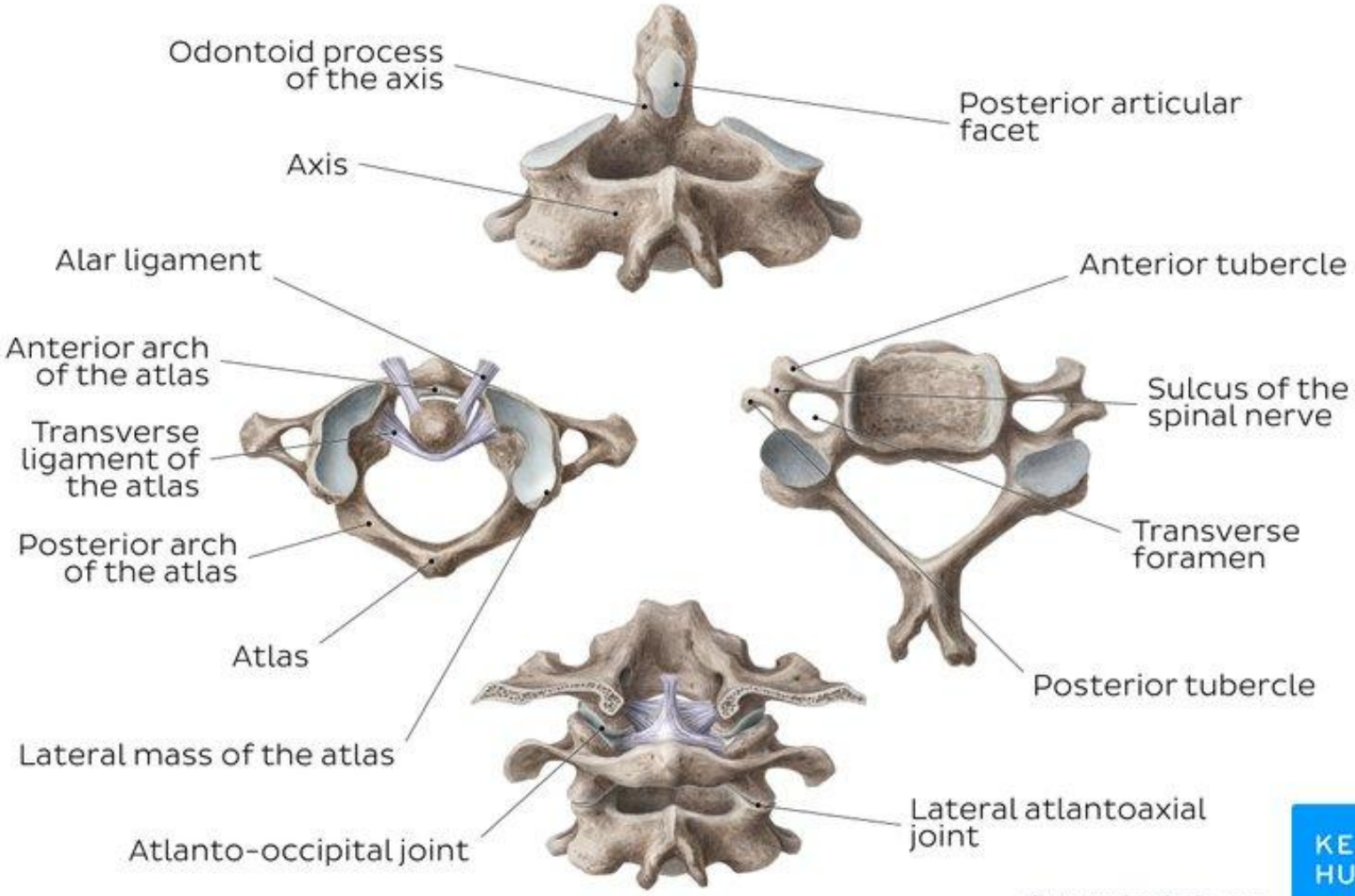
Anatomy Review: Major Bones & Cartilage of the Neck, Head, & Jaw

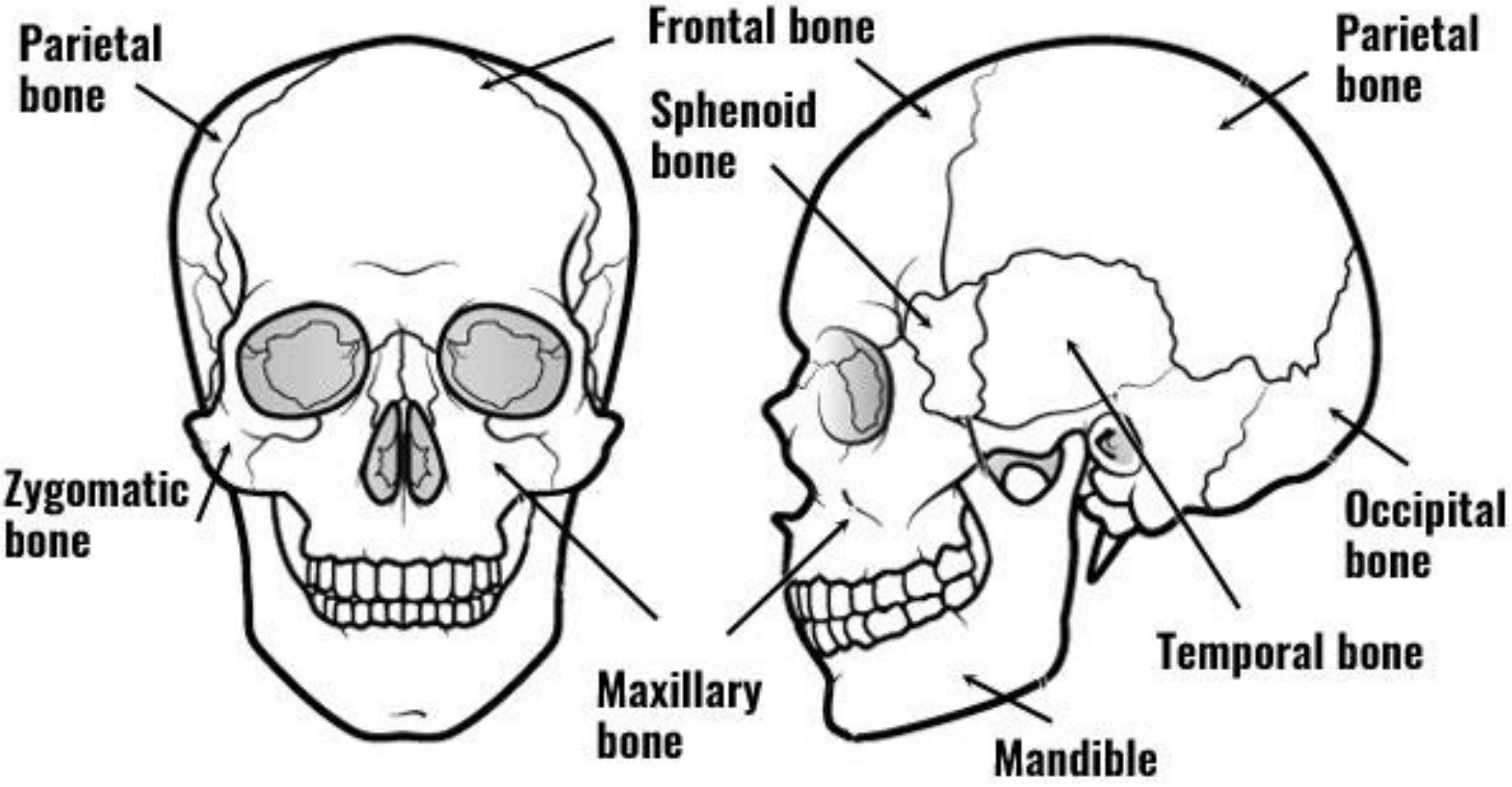
- **Atlas (C1)**
- **Axis (C2)**
- **Cervical Vertebrae 3-7**
- **Hyoid Bone & Trachea**
- **Major Bones of the Cranium & Face**
  - **Occipital Bone**
  - **Parietal Bone**
  - **Frontal Bone**
  - **Sphenoid Bone**
  - **Temporal Bone**
  - **Maxillary Bone**
  - **Zygomatic Bone**
- **Mandible**

C1 & C2 have their own unique shapes to allow the cranium to pivot rotationally to the left and right and also side to side as well as looking up and down

C3-C7 have subtle differences but are functionally similar

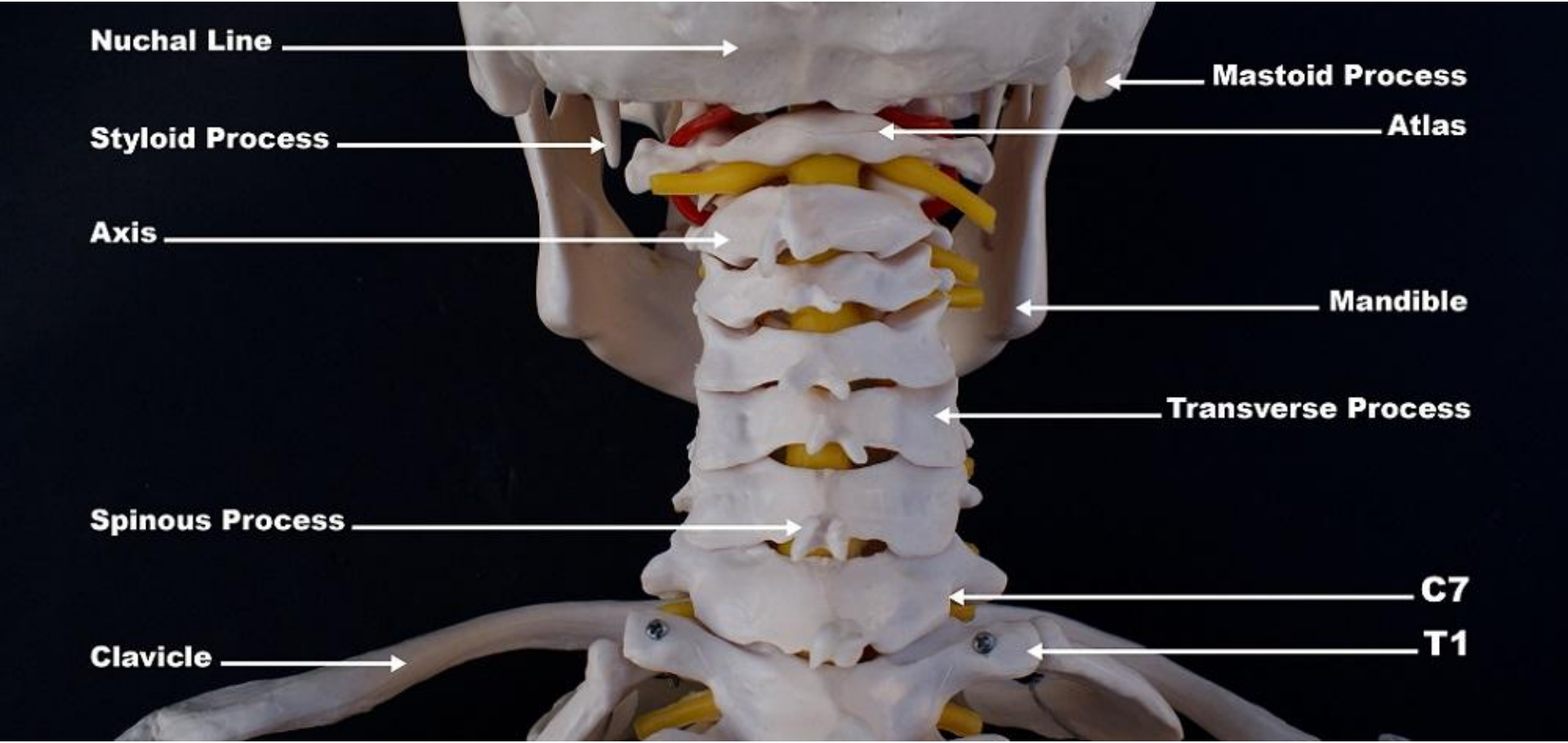




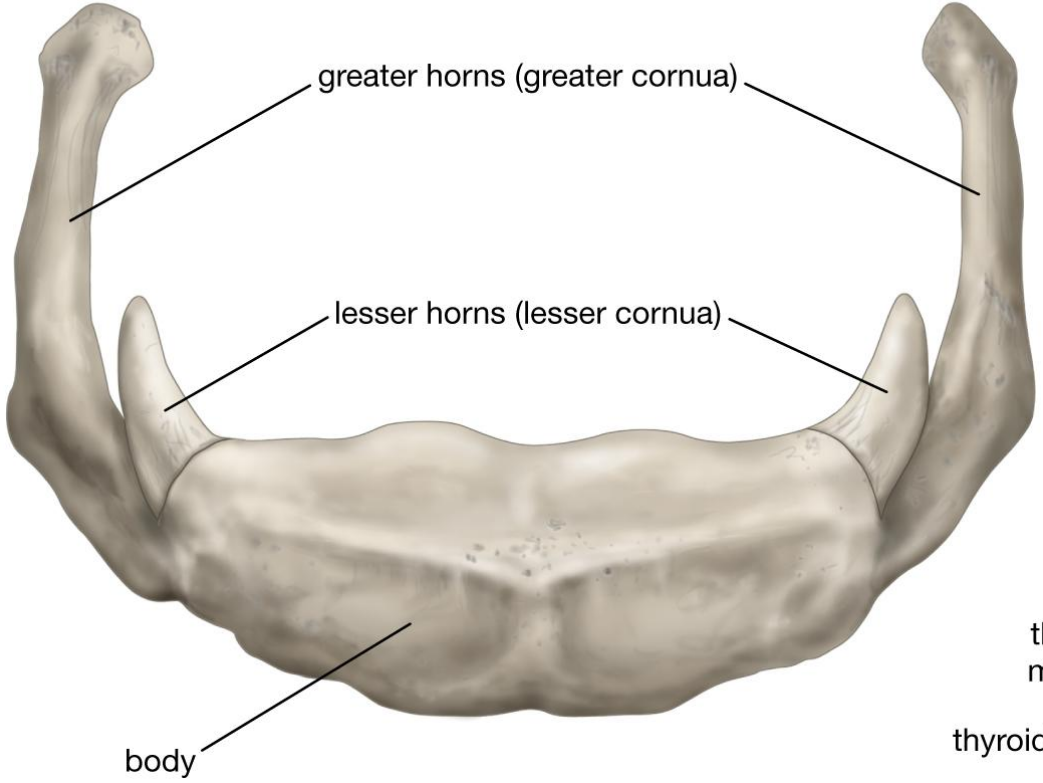

Parietal bone
Frontal bone
Sphenoid bone
Parietal bone
Zygomatic bone
Occipital bone
Temporal bone
Maxillary bone
Mandible

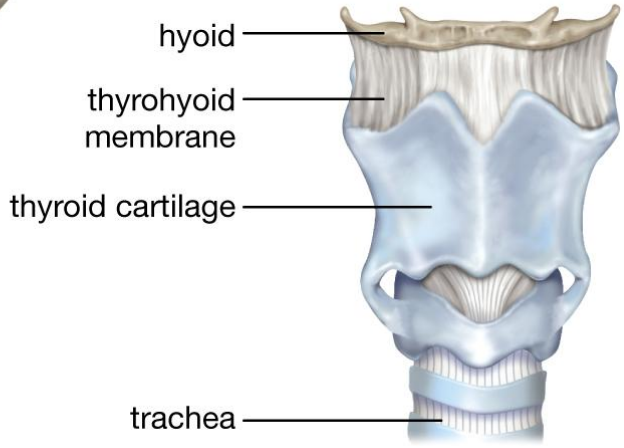
Anatomy Review: Major Bony Landmarks Most Relevant to Manual Therapy of Head, Neck, & Jaw

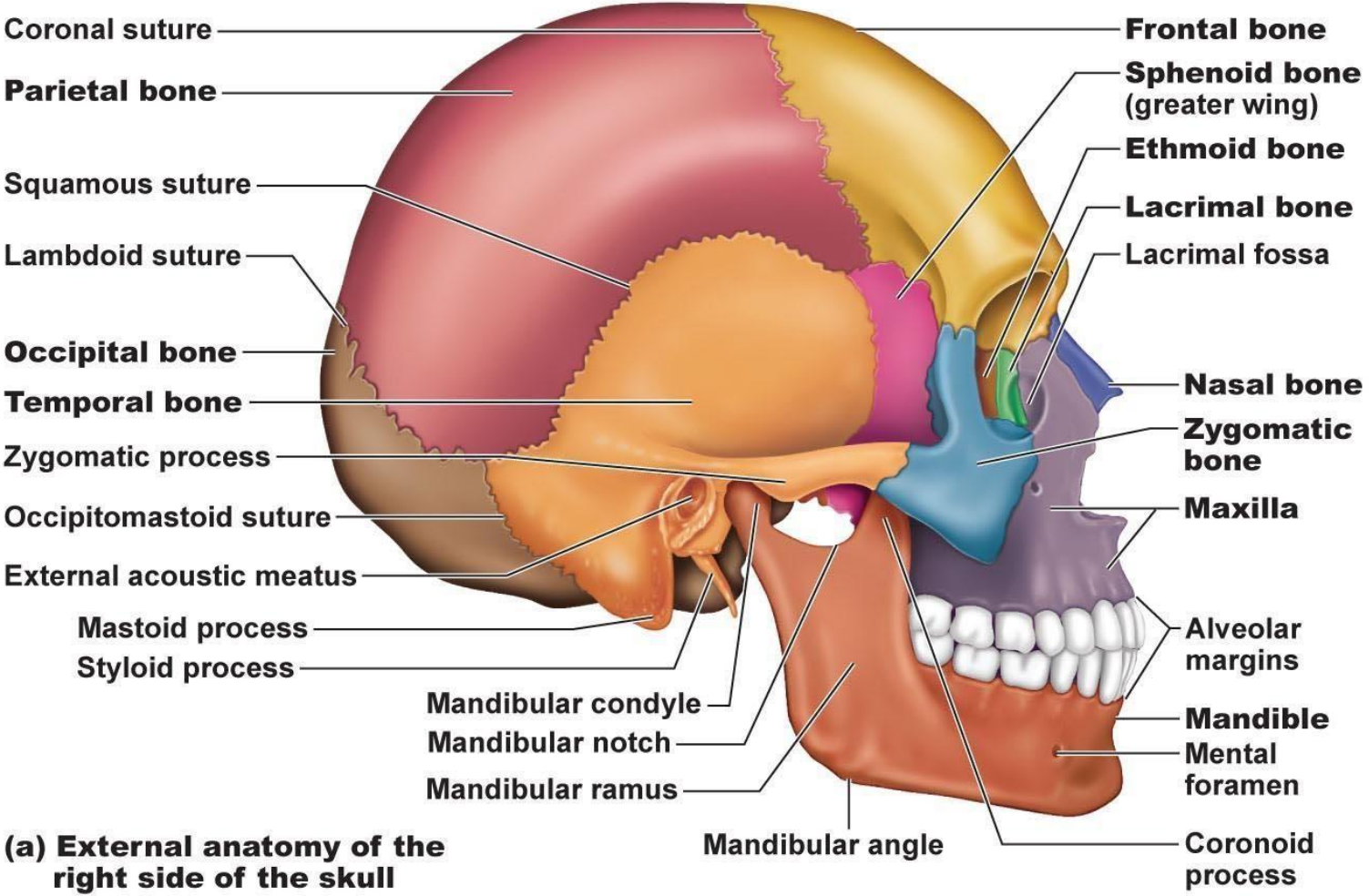
- **Transverse Processes of C1-7**
- **Lamina Groove of C1-7**
- **Spinous Processes of C1-7**
- **Styloid Process**
- **Mastoid Process**
- **Superior Nuchal & Inferior Nuchal Lines**
- **Angle of Mandible**
- **Body of the Hyoid Bone**
- **TMJ & Mandibular Condyle**
- **Temporal Fossa**


Nuchal Line
Mastoid Process
Styloid Process
Atlas
Axis
Mandible
Transverse Process
Spinous Process
C7
Clavicle
T1

Human hyoid bone







(a) External anatomy of the right side of the skull

Anatomy Review:
Posterior Muscles of the Neck & Relevant Attachments

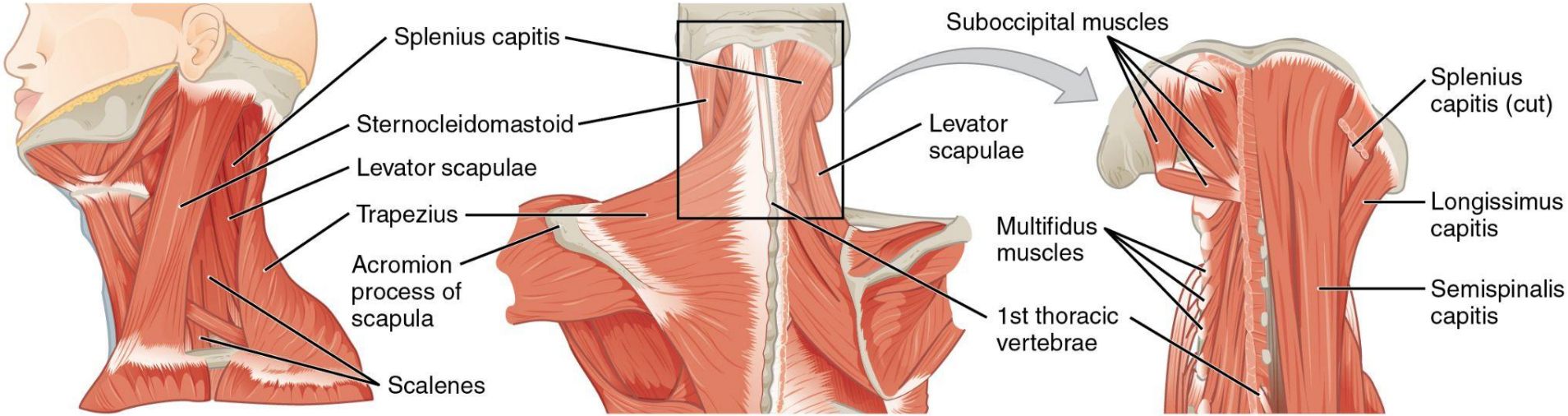
Surface Layer Muscles of the Posterior Neck

- **Trapezius**
  - attaches medial ⅓ of superior nuchal line
  - spinous processes of C1-T12
- **Splenius Capitis**
  - attaches to spinous processes of C7-T3
  - nuchal ligament
  - lateral superior nuchal line
  - mastoid process
- **Levator Scapulae**
  - medial border of the scapulae
  - transverse processes of C1 - C4 vertebrae

Anatomy Review:
Posterior Muscles of the Neck & Relevant Attachments

Deeper Layer Muscles of the Posterior Neck

- **Splenius Cervicis**
  - **Spinous processes of T3 – T6 vertebrae**
  - **Transverse processes of C1 – C3 vertebrae**
- **Suboccipitals (see illustrations for attachments)**
  - **Rectus capitis posterior major**
  - **Rectus capitis posterior minor**
  - **Obliquus capitis inferior**
  - **Obliquus capitis superior**

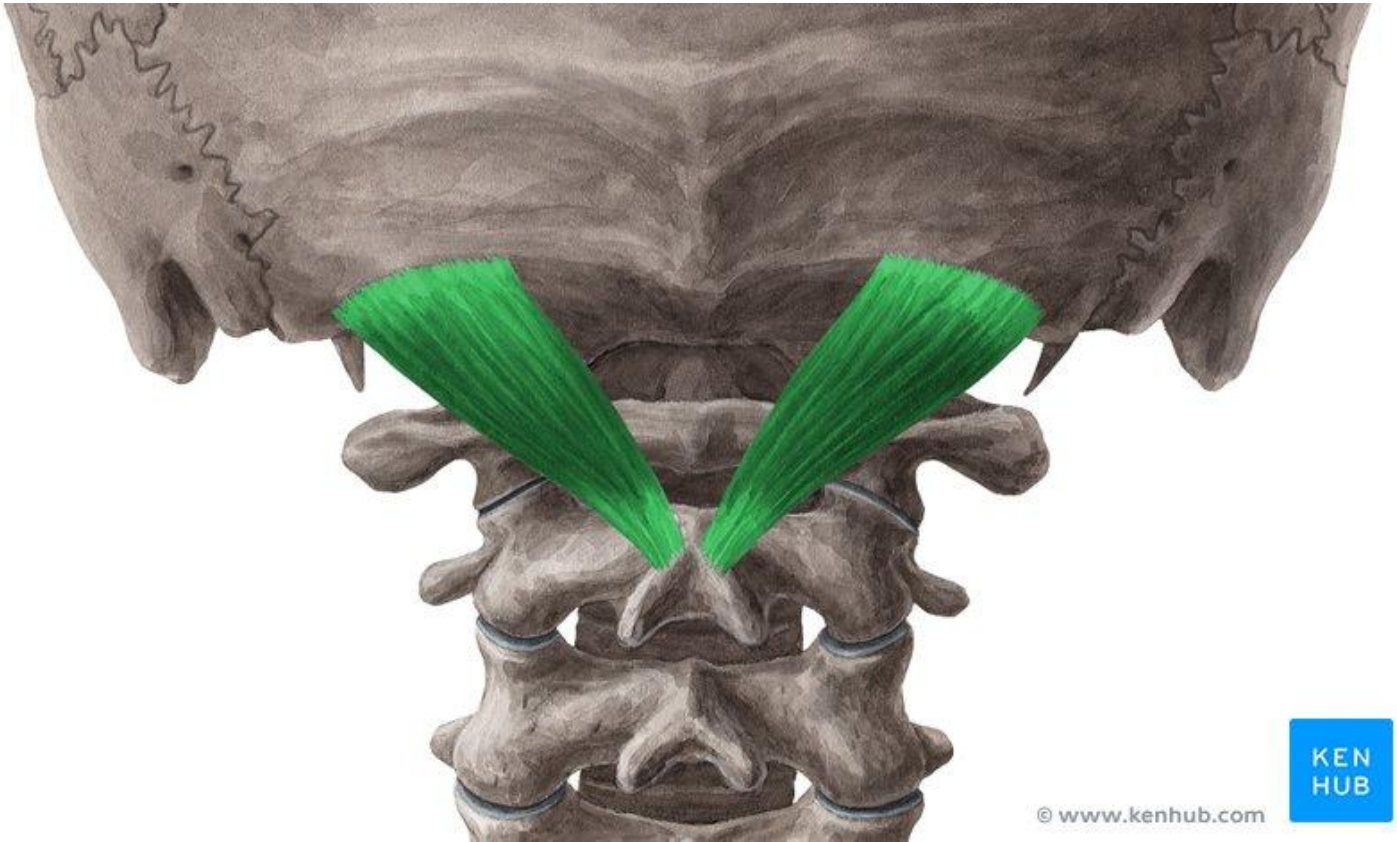


Neck muscles (left lateral view)

Superficial neck muscles: right side trapezius removed (posterior view)

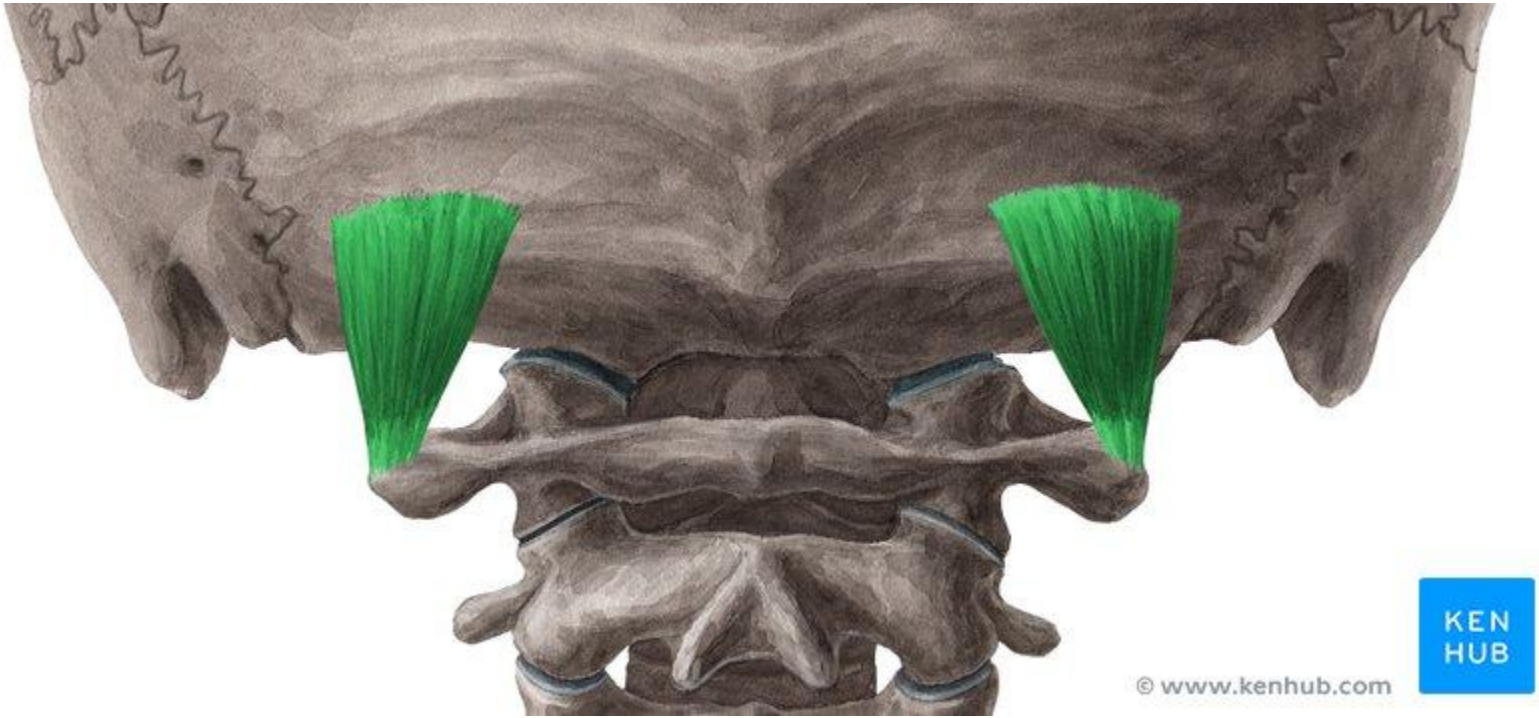
Deep neck muscles: left side semispinalis capitis removed (posterior view)

Rectus capitis posterior major

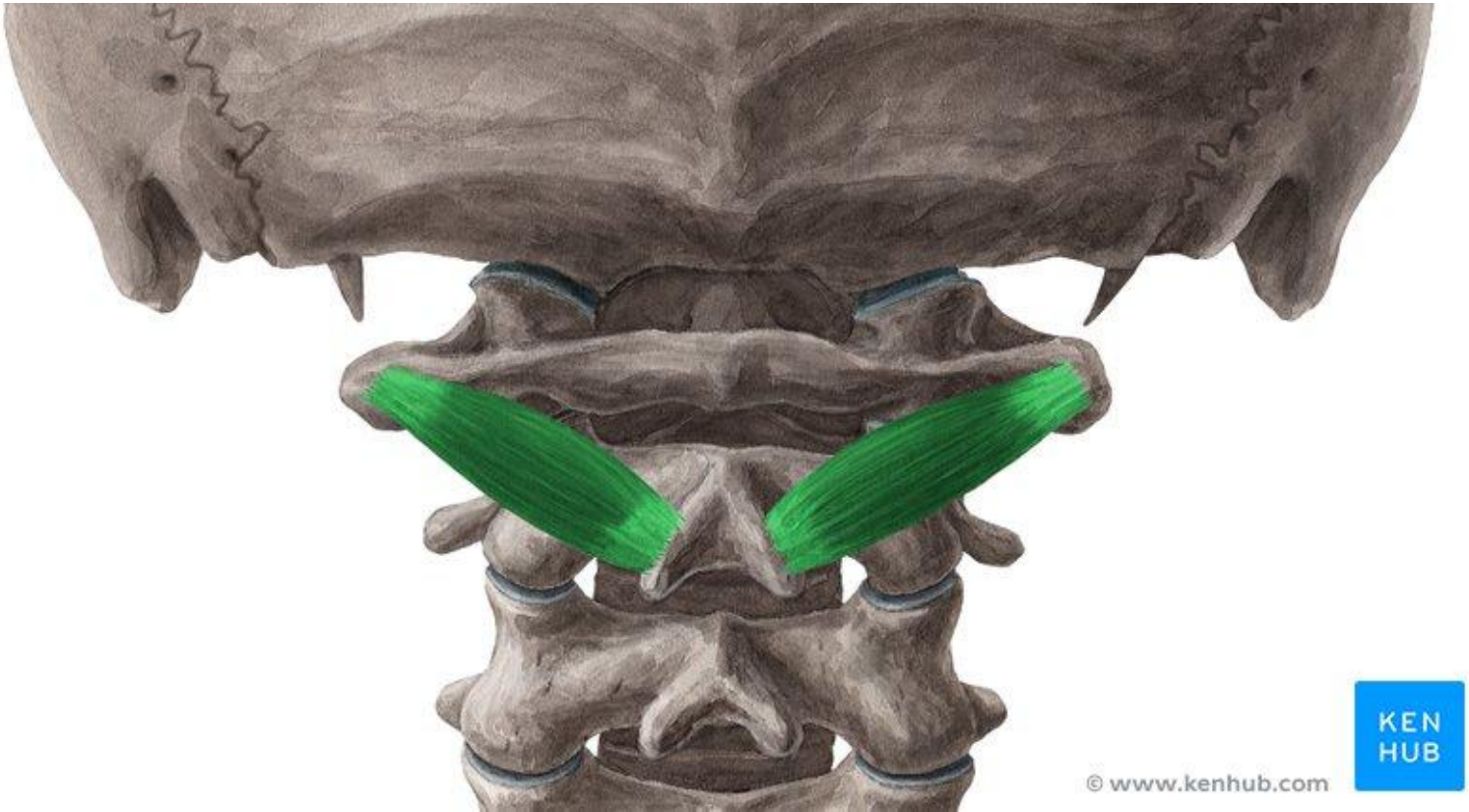


Rectus capitis posterior minor

Obliquus capitis superior



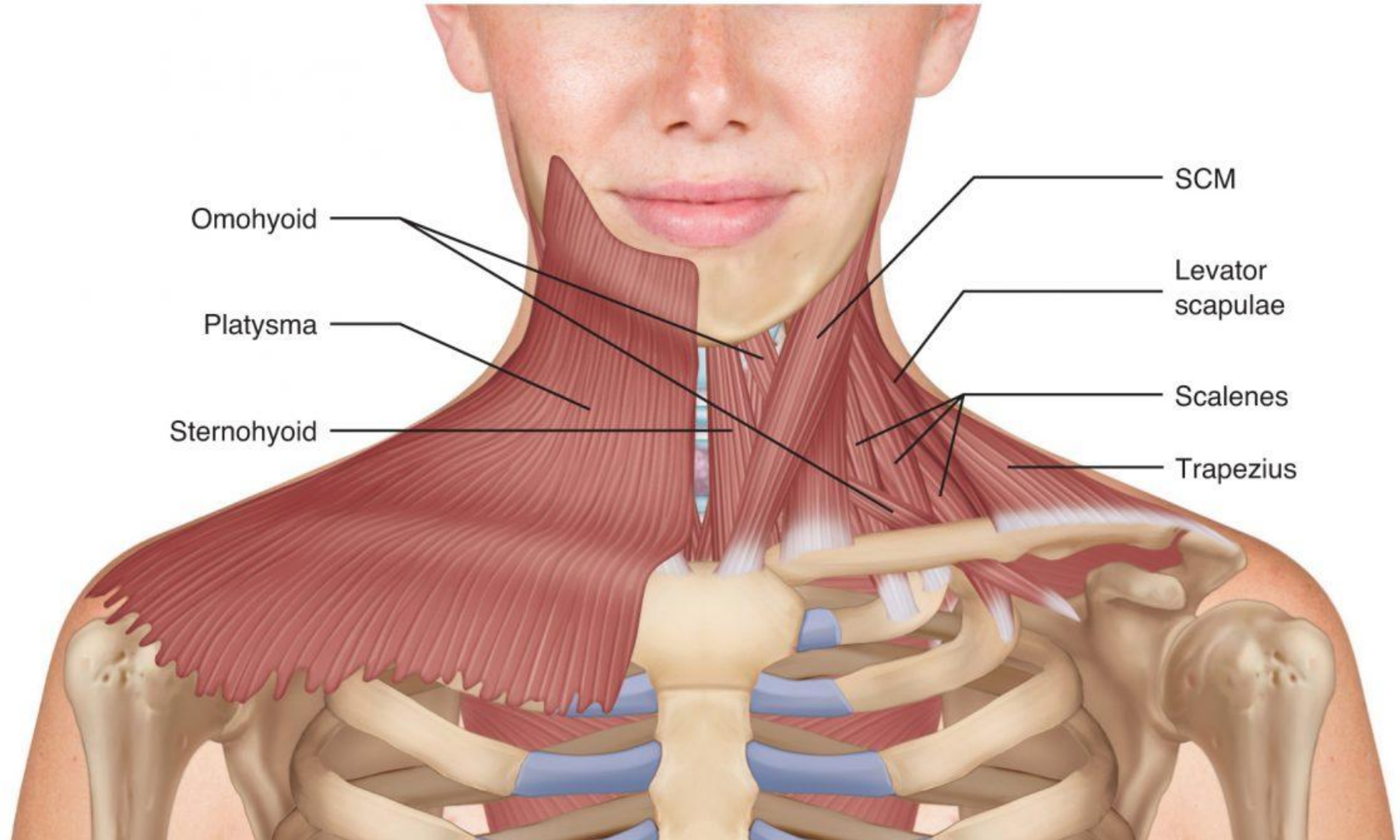
Obliquus capitis inferior



Anatomy Review:
Anterior Muscles of the Neck & Relevant Attachments

Surface Layer Muscles of the Anterior Neck

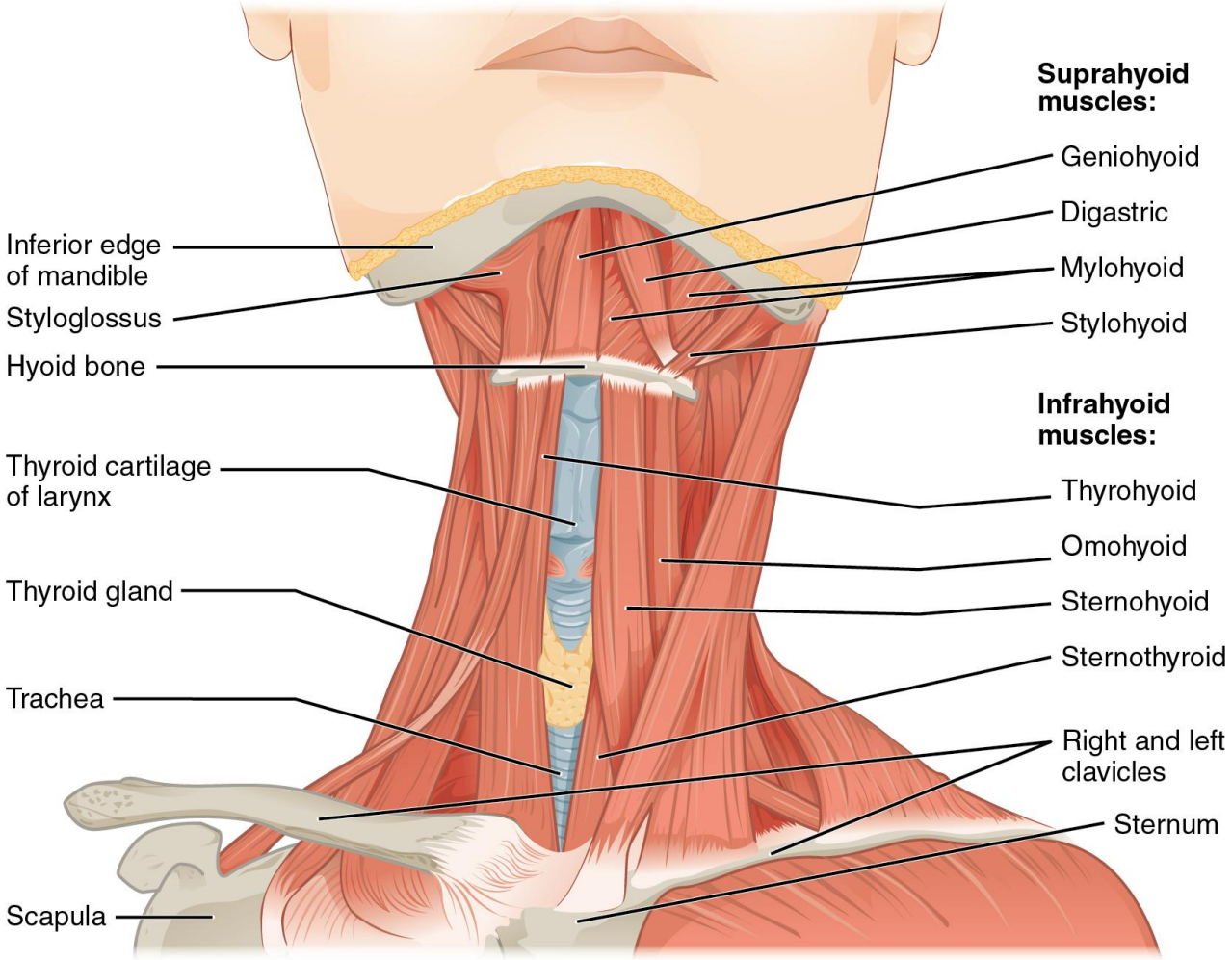
- **Platysma**
  - **Attaches to clavicle**
  - **the acromial region and superior portions of the pectoralis major and deltoid muscles**
  - **Lower border of the mandible**
- **Sternocleidomastoid (SCM)**
  - **Attaches to clavicle, manubrium, and ribs 1 & 2**
  - **Mastoid process**
- **Scalenes**
  - **Attach to ribs 1 & 2**
  - **Transverse processes of C2-C7**


Omohyoid
Platysma
Sternohyoid
SCM
Levator scapulae
Scalenes
Trapezius

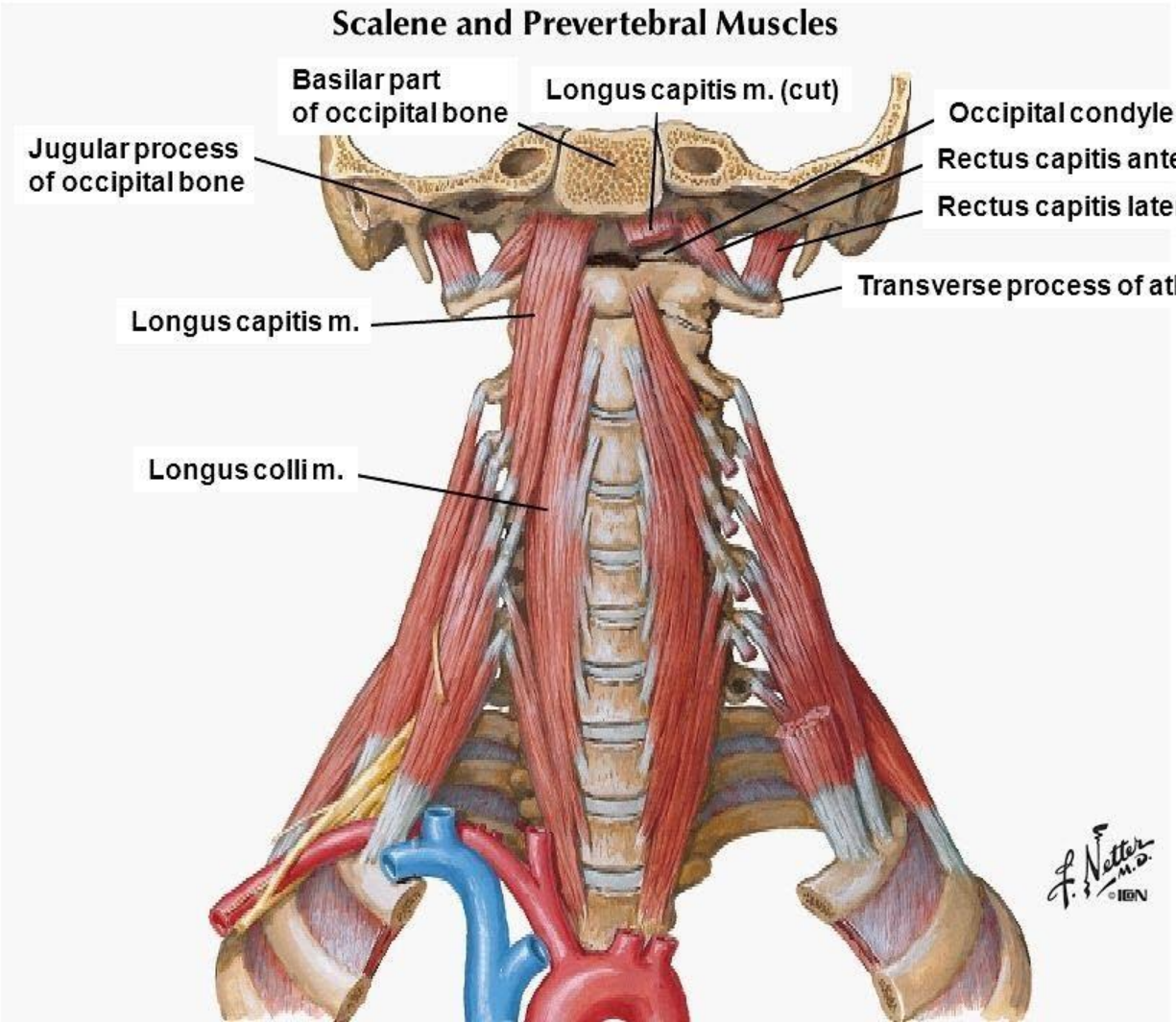
Anatomy Review:
Anterior Muscles of the Neck & Relevant Attachments

Deeper Layer Muscles of the Anterior Neck

- **Suprahyoids (see illustration for attachments)**
  - **Geniohyoid**
  - **Digastric**
  - **Mylohyoid**
  - **Stylohyoid**
- **Infrahyoids (see illustration for attachments)**
  - **Thyrohyoid**
  - **Omohyoid**
  - **Sternohyoid**
  - **Sternothyroid**
- **Longus Colli (see illustration for attachments)**

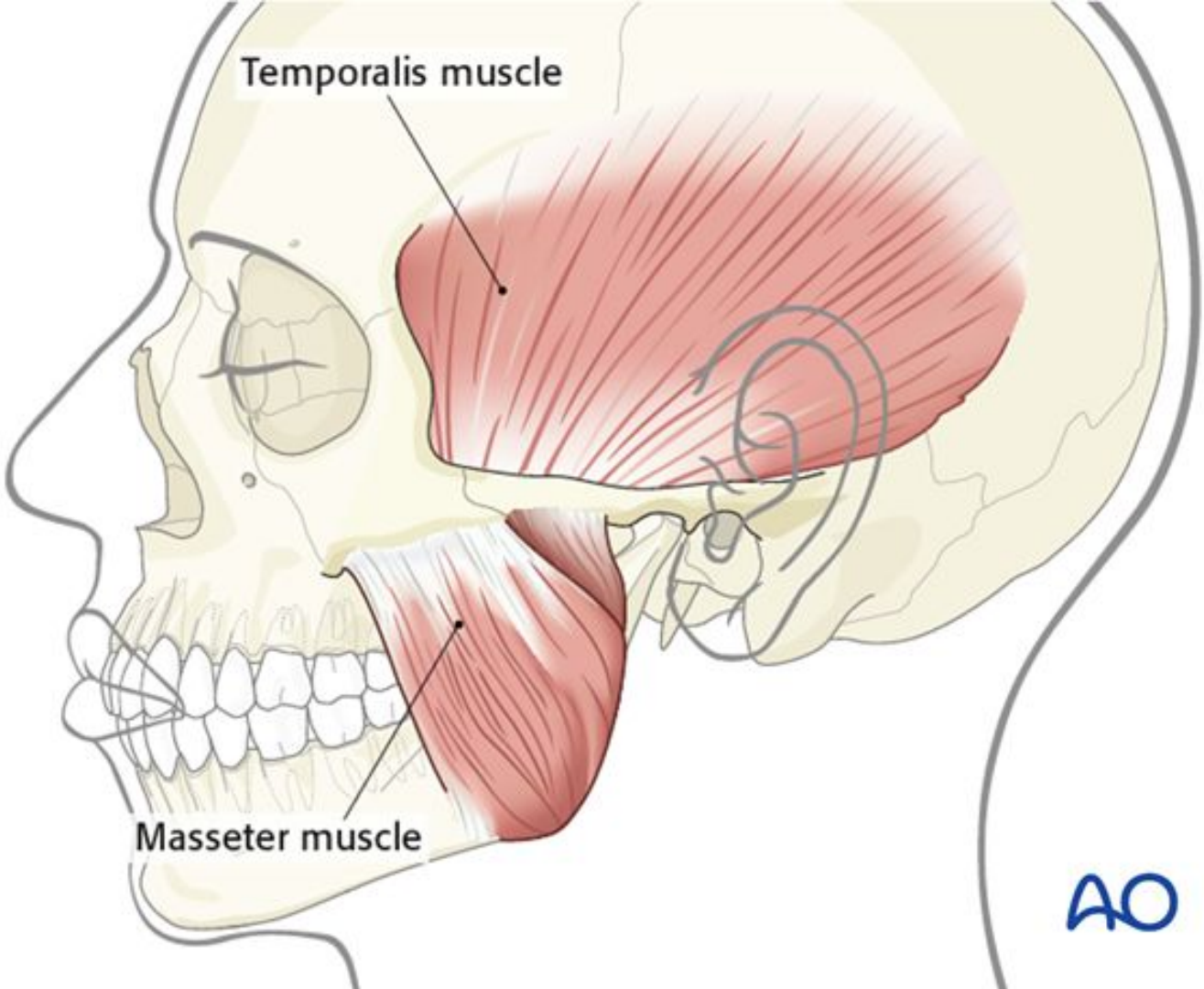

Suprahyoid muscles:
Geniohyoid
Digastric
Mylohyoid
Stylohyoid
Inferior edge of mandible
Styloglossus
Hyoid bone
Infrahyoid muscles:
Thyrohyoid
Omohyoid
Sternohyoid
Sternothyroid
Thyroid cartilage of larynx
Thyroid gland
Trachea
Right and left clavicles
Sternum
Scapula

Scalene and Prevertebral Muscles

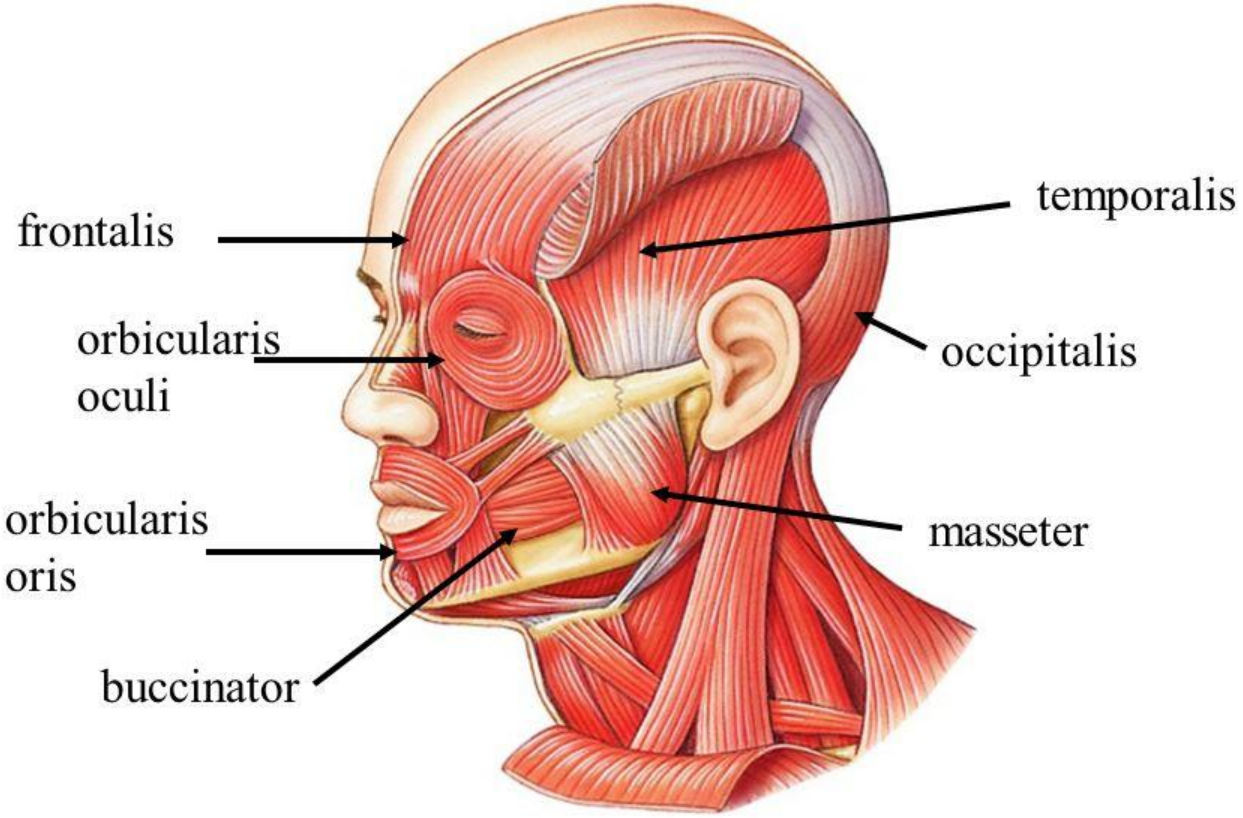


Anatomy Review:
Major Exterior Muscles of the Head & Jaw

- **Temporalis**
  - **Coronoid process of mandible**
  - **Temporal fossa**
- **Masseter**
  - **maxillary process of zygomatic bone**
  - **Inferior border of zygomatic arch**
  - **Lateral surface of ramus and angle of mandible**
- **Frontalis (muscle has no bony attachments)**


Temporalis muscle
Masseter muscle

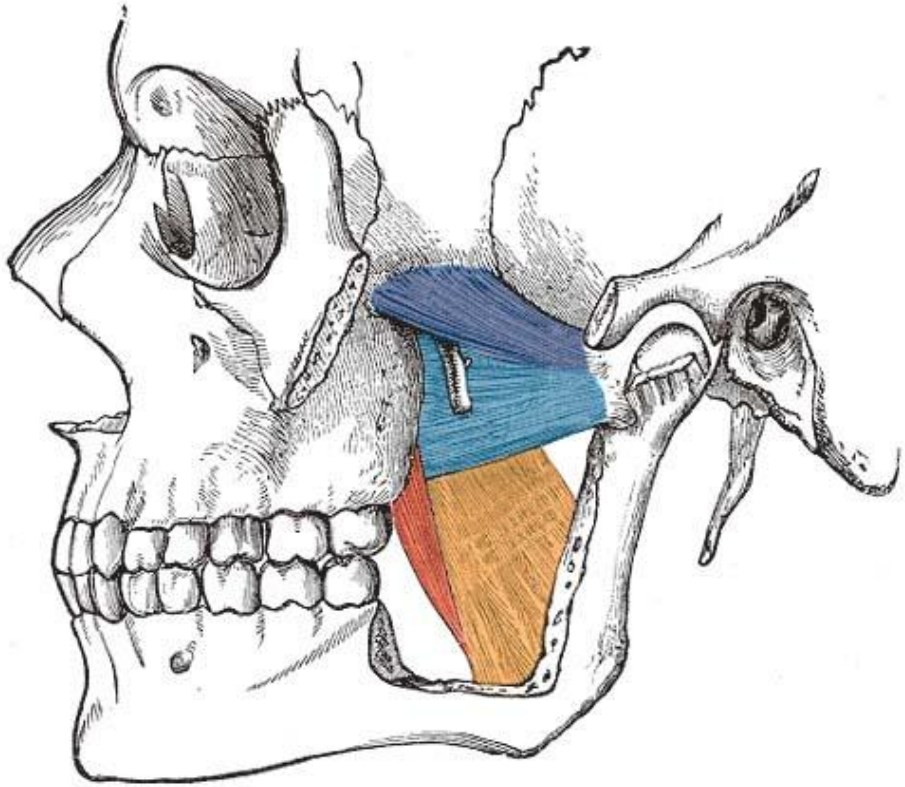
Muscles of the Head



Anatomy Review:
Major Interior Muscles of the Jaw

- **Medial Pterygoid**
  - **Angle of the mandible (can only access this attachment for manual work)**
  - **Lateral pterygoid plate**

- **Lateral Pterygoid**
  - **Sphenoid bone**
  - **Joint capsule of temporomandibular joint**
  - **Condyloid process of mandible**



Superior head of the lateral pterygoid

Inferior head of the lateral pterygoid

Deep head of the medial pterygoid

Superficial head of the medial pterygoid

Common Misalignment Patterns

- **Head Forward Posture**
- **Military Neck (often needs to be palpated to confirm)**
- **Head shifts off center line to left or right**
- **Head tilts at AO joint to left of right**
- **Neck/Head rotate to left or right**
- **Jaw sits off center line to left or right**
- **Jaw protracts**
- **Jaw retracts**

Example #1 - Head Forward Posture

- **Generally pairs with a noticeable shift of upper chest to the posterior**
- **Often present with pelvis shifted forwards as related to the ankle joint and/or anteriorly rotated**
- **Head angles forward to balance**

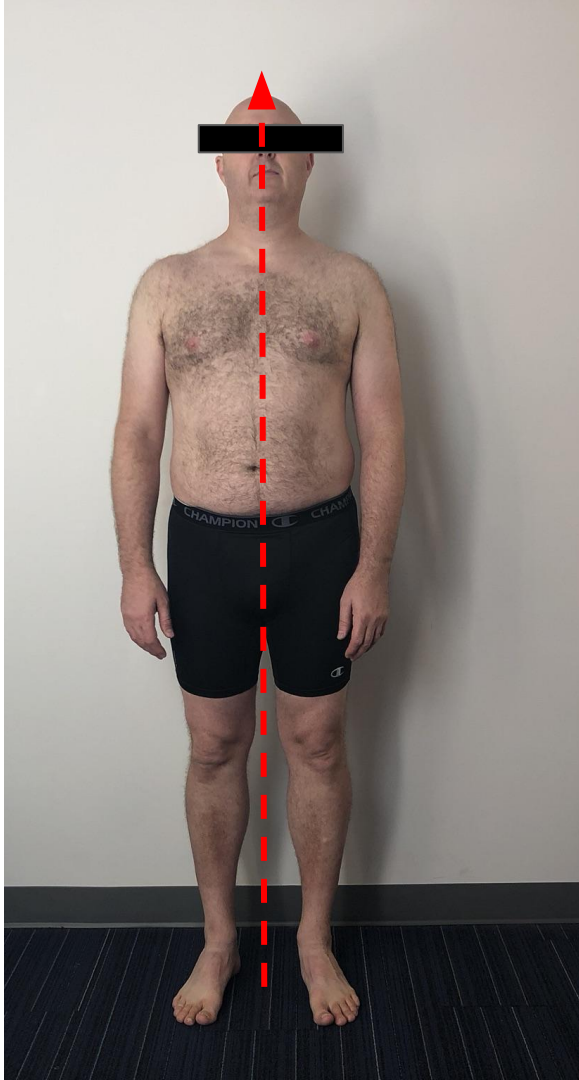
Example #2 - Military Neck (lacking cervical curve)

Military neck

Healthy neck

Example #3 - Head shifts to the Left

- **Head sits to the right or left of the centerline of plumb line drawn through sternum, pelvis & center of ankles**
- **Eyes and skull are still facing forward and not rotated**
- **In this example, his left ear is slightly further away from the centerline than his right ear**



Example #4 - Head Tilts on AO to Left

- **Line of ears are not level with the perpendicular to the centerline plumb line**

Example #5 - Head Rotates

- **Generally noticeable when centerline of face does not line up with sternum but top of head does line up with sternum**
- **Eyes will have to look slightly left or right to focus**

Example #6 - Jaw Sits to the Right

Example #7 - Jaw Protracts

Example #8 - Jaw Retracts

Possible Symptoms Due to Neck/Head Misalignments

Early Stage Symptoms

- Tight achy shoulders
- Stiff neck or Shoulders
- Jaw clenching
- Intermittent Neck or Shoulder Pain

2nd Stage Symptoms

- Headaches
- Eye Strain
- Teeth Grinding and/or TMJ
- Loss of Shoulder ROM
- Chronic Neck Pain

Possible Symptoms Due to Neck/Head Misalignments

Late Stage Symptoms

- **Cervical disc herniations or stenosis causing nerve impingement locally and/or along brachial plexus**
- **Migraines**
- **Chronic Severe TMJ**
- **Neuropathy in hands or fingers**
- **Tendonitis in shoulders, elbows, and/or wrists**

Some Special Cases to Look Out For

- **Whiplash**
  (either overt impact injury or smaller similar impacts over time)
  - **Car accident**
  - **Skiing accident**
  - **Soccer history**
  - **Boxing history**
- **Torticollis (compacted cervicals throughout neck)**
- **Impact Injury history resulting in asymmetrical bone structures in cervical vertebrae, skull, or mandible**
- **Fusion surgeries of cervical vertebrae**
- **Scoliosis**
- **PTSD & Chronic Stress Syndrome (will fire scalenes and lift head to inhale)**

Notes on Sequencing Neck Work into Sessions

Finishing the Session

- **I propose always working on the neck last in a session as intensity from working on other areas can cause a fight/flight response that raises the shoulders and cliches the jaw**
- **Working on the neck first then other parts of the body tends to undo the release work you've already done for the neck**
- **When I finish a neck series to end a session I generally finish with a nice suboccipital hold which can "knock out" the client and put them to sleep after the anterior work which can be intense to receive especially for a client who has never had work there before**

Proposed Treatment Sequence: Posterior Neck
Can be performed in side lying or supine positions

- **Starting at lateral edge of trapezius attachment at clavicle, fascially release from lateral edge to attachment on spinous process of C7**
- **Repeat working horizontally for each cervical vertebra from C7 through C1 for a total of 7 strokes**
- **Sink your intention behind trapezius to the layer of splenius capitis and draw a diagonal fascial stroke from lowest attachment on spinous processes of T3 up to mastoid process**
- **Repeat drawing diagonal strokes from T2 through C7 for a total of 4 strokes**

Proposed Treatment Sequence: Posterior Neck
Can be performed in side lying or supine positions

- **Use cross fiber friction on attachments of trapezius, levator scapula, and splenius capitis at the superior nuchal line**
- **Use cross fiber friction on attachments of SCM and suboccipitals on the mastoid processes**
- **Use cross fiber friction on attachments of splenius capitis, levator scapula, and scalenes on the transverse processes of C1 through C7**

Proposed Treatment Sequence: Posterior Neck
Can be performed in side lying or supine positions

- **Draw fascial strokes through bellies of levator scapula and splenius cervicis**
- **Use trigger point techniques to release suboccipitals**

(The following should only be performed in supine position)

- **Apply gentle traction techniques to each vertebra C7 through C1 palpating and testing ROM in all planes**
- **Try active release techniques on trapezius and underlying muscles by applying pressure with soft fist while client turns head slowly to other side**
- **Test ROM for each cervical vertebra again**
- **Finish with traction on mastoid processes and suboccipital hold**

Head, Neck, & Jaw

Day 2

- Review posterior neck sequence
- Observe and practice treatment techniques for the anterior neck in supine position
- Observe and practice advanced techniques for working on longus colli
- Observe and practice advanced techniques for working on pterygoids

Notes on More Invasive Advanced Techniques

- **Working on the anterior neck can be sensitive and can trigger reflexes and fear responses including muscle guarding, choking, and coughing in clients**
- **These muscles don’t need a lot of pressure in order to create change in their tone**
- **Start out light until you gain experience and comfort with landmarking each set of muscles and get a better gauge for how much pressure the average clients find therapeutic**

Notes on More Invasive Advanced Techniques

- **The space between the SCM muscles has several important structures to be aware of including the notch between the collarbones, the trachea, and the hyoid bone**
- **These structures are delicate and should not be approached with very much pressure, especially as you first start working on them**
- **It is a good practice to ask for consent to work on these areas, and to explain to the client the reasoning for working them**

Notes on More Invasive Advanced Techniques

- **In addition, it can be helpful to describe the musculature to the client so that they understand that you are working on muscles which can often alleviate worry and guarding on their part**
- **However, don’t shy away from working on these muscles as releasing and rebalancing the hyoid musculature and the longus colli muscles will have have profound effects for clients dealing with chronic neck and jaw pain as well as headaches and shoulder issues**

Proposed Treatment Sequence: Shorter Posterior Neck Series Leading into Anterior Neck Series (Supine)

- **Starting at lateral edge of trapezius attachment at clavicle, fascially release from lateral edge to attachment on spinous process of C7**
- **Repeat working horizontally for in 3-4 broad strokes moving higher up the neck each time with the last stroke at C1**
- **Sink your intention behind trapezius to the layer of splenius capitis and draw a diagonal fascial stroke from lowest attachment on spinous processes of T3 up to mastoid process**
- **Repeat drawing 1-2 more broad diagonal strokes from T2 through C7 up to mastoid process**

Proposed Treatment Sequence: Shorter Posterior Neck Series Leading into Anterior Neck Series (Supine)

- **Use cross fiber friction on attachments of trapezius, levator scapula, and splenius capitis at the superior nuchal line**
- **Use cross fiber friction on attachments of SCM and suboccipitals on the mastoid processes**
- **Use cross fiber friction on attachments of splenius capitis, levator scapula, and scalenes on the transverse processes of C1 through C7**

Proposed Treatment Sequence: Shorter Posterior Neck Series Leading into Anterior Neck Series (Supine)

- **Draw fascial strokes through bellies of levator scapula and splenius cervicis**
- **Do a gentle suboccipital hold or the more advanced version of lifting head onto one hand several inches off the table to give access and allow myofascial releases of the suboccipitals with opposite thumb**
- **Apply gentle traction techniques to each vertebra C7 through C1 palpating and testing ROM in all planes**
- **Try active release techniques on trapezius and underlying muscles by applying pressure with soft fist while client turns head slowly to other side**
- **Test ROM for each cervical vertebra again**
- **Finish with traction on mastoid processes and suboccipital hold**

Proposed Treatment Sequence: Anterior Neck Series (Supine)

Platysma Releases

- **Lightly grab edge of mandible with both hands and pull platysma down towards lower attachments gliding along surface of tissue with not pressure downwards**
- **Hold tissue just below each clavicle and ask client to turn head gently to left and right a few times to stretch the platysma**
- **Ask client to protract their jaw while continuing to hold lower platysma to increase stretch**

Proposed Treatment Sequence: Anterior Neck Series (Supine)

SCM Releases

- **Use thumb to hold lower SCM attachments applying pressure horizontally and laterally to avoid pressure into the base of throat notch**
- **Rock head lightly while holding SCM attachment in place (this is a pin & stretch technique which we'll be using on SCM & scalenes as well)**
- **Fascially release SCM from lower attachment to upper attachment on mastoid using horizontal pressure along muscle and not down into it (never apply pressure down into throat area)**
- **Lastly, if needed, hold SCM while drawing it laterally to stretch it. Ask client to slowly turn head to opposite side to increase the stretch. Let them be in charge of how much they want to apply this active stretch.**

Proposed Treatment Sequence: Anterior Neck Series (Supine)

Scalenes Releases

- **Use thumb to hold lower scalenes attachments on ribs 1 & 2 applying down and behind the clavicle**
- **Start with most medial scalene and work on each “rope” that you can find moving laterally (on most clients you’ll find at least 4 ropes on others all 7)**
- **Rock head lightly while holding scalene attachments in place using the pin & stretch technique**
- **Fascially release scalenes from approximate upper attachments towards lower attachments again using horizontal pressure along muscle and not down into it (never apply pressure down into throat area)**
- **Lastly, if needed, hold each scalene attachment and ask client to slowly turn head to opposite side to increase the stretch. Let them be in charge of how much they want to apply this active stretch.**

Break for Lunch

Proposed Treatment Sequence: Anterior Neck Series Part 2 Advanced Work (Supine)

Hyoid Releases

- **Gently hold hyoid bone between thumb and index finger on the sides and lightly right horizontally from side to side**
- **Use gentle cross fiber friction on the hyoid attachments on the hyoid bone on both upper and lower edges**
- **Lightly draw suprahyoid muscles fascially up from hyoid bone to mandible**
- **Use gentle cross fiber friction on hyoid attachments on the mandible being careful not to put pressure on glands**

Proposed Treatment Sequence: Anterior Neck Series Part 2 Advanced Work (Supine)

Longus Colli Release

- **Lightly hold the trachea between thumb and fingers and practice shifting it from side to side to get used to the idea that it's free floating and not fixed in place**
- **Using straight fingers find the space between trachea and SCM and apply sideways pressure to move trachea out of the way**
- **Sink fingers down very slowly and gently into the space created at a slight angle diagonally towards cervical vertebra**
- **This space allows you to avoid major arteries and nerves**

Proposed Treatment Sequence: Anterior Neck Series Part 2 Advanced Work (Supine)

Longus Colli Release (Continued)

- **You may feel a pulse…this is okay as long as it continues. If the pulse goes away when you apply further pressure STOP and back off as you've cut off flow in the carotid artery**
- **Sinking slowly and gently you should be able to sink into longus colli and actually feel the bodies of the cervical vertebrae under your fingertips**
- **For now, simply learn to contact longus colli and hold that contact for 10-20 seconds. This is a trigger point release that can be very impactful.**
- **Eventually as you gain confidence in finding longus colli and working on it you'll be able to apply fascial release strokes along it in addition to the trigger point release.**

Proposed Treatment Sequence: Jaw Series (Supine)

Temporalis Release

- **Squeeze both side of the skull between both hands and fascially slide up the temporalis on one side**
- **Use gentle cross fiber friction throughout muscle and notice any trigger points**
- **Use trigger point release on any outstanding trigger points**
- **Use cross fiber friction on the lower tendon**
- **Turn head to other side and repeat**

Proposed Treatment Sequence: Jaw Series (Supine)

Masseter Release

- **Fascially slide from upper attachment to angle of mandible**
- **Use gentle cross fiber friction throughout muscle and notice any trigger points**
- **Use trigger point release on any outstanding trigger points**

Proposed Treatment Sequence: Jaw Series (Supine)

Pterygoid Releases

- **Always use gloves when doing inner mouth work and ask for consent and explain why you are doing the work**
- **There are 4 trigger points, one for each lateral and medial pterygoid, 2 on each side**
- **The medial pterygoid attachment is on the inside of the angle of the mandible**
- **The lateral pterygoid muscle belly is behind the upper back molar slightly lateral and will feel “webbed”**

Proposed Treatment Sequence: Jaw Series (Supine)

Pterygoid Releases (continued)

- **Start with one side's medial pterygoid trigger point, and make contact. A little pressure goes a long way and this alone can be super intense.**
- **If the intensity diminishes, ask them to open jaw just a tiny fraction wider**
- **Then ask them to see if they can move their jaw (but not their head) from side to side (this is another pin & stretch technique)**
- **Ask them to open another tiny fraction wider.**
- **Repeat them moving side to side.**
- **Ask them to protract their jaw (move it down and towards the ceiling) without closing their jaw (they might not be able to).**
- **Gently release pressure, take out your finger, and give them 5-10 seconds to process what just happened**

Proposed Treatment Sequence: Jaw Series (Supine)

Pterygoid Releases (continued)

- **Repeat the same sequence for the lateral pterygoid trigger point in the muscle belly.**
- **Switch sides and repeat starting with the medial first then lateral pterygoid trigger points**
- **Notice if any of the muscles are “frozen” ie they cannot perform the movements on one side vs the other or in medial or lateral sets only**
- **A little goes a long way. If you find frozen pterygoids do not attempt to “make” them unfreeze. Give their nervous system time in between this session and the next to process the existence of these muscles and try again next time.**