“ALSO it would be extremely helpful if one of the anatomy professors made a new lecture that just went over common latin words used in anatomy. For example, foramen=hole. I think if you made a mandatory lecture that you gave to med students before starting anatomy and then let them keep the movie and remind them how good a reference this will be, it would have made learning these names a lot less stressful and challenging.”
The Anatomical Position
A point of reference
No matter what position the patient is in, assume standing-up in Anatomical position

Anterior/Ventral vs. Posterior/Dorsal
- Anterior/Ventral - towards the front.
- Posterior/Dorsal - towards the back.

Superior/Cranial vs. Inferior/Caudal
- Superior/Cranial - towards the cranium.
- Inferior/Caudal - towards the feet.
Lateral vs. Medial

- Medial - towards the midline.
- Lateral - away from the midline.

Proximal vs. Distal

- Proximal – towards the origin of a limb.
- Distal – away from the origin of a limb.

Superficial/Deep

- Superficial - towards the outside.
- Deep - towards the inside.
TISSUES:
4 types:
- Epithelia (line surfaces)
- Connective tissue (diverse – bone, cartilage, ligaments, tendons)
- Ligament – extends from a bone to another bone, Tendon – from muscle to bone
- Muscle (skeletal, cardiac, smooth)
- Nervous (brain, spinal cord, nerves, etc)

Skin or Cutaneous Membrane:
- Epidermis (epithelium)
- Dermis (connective tissue)

Hypodermis (connective tissue below the Dermis)
- also called Superficial Fascia
- Deep Fascia (deep to superficial fascia)

“Membrane” (epithelia + connective tissue)
“Fascia” (a layer of mixed connective tissues)

Fascia
Surrounds and separates muscles, nerves, blood vessels.

Ligament
Bone to Bone

Tendon
Muscle to Bone
Skeletal System

• Axial Skeleton
  – Along the Axis or Midline bones and the ribs
• Appendicular Skeleton
  – Appendages, including the shoulder and pelvic girdles

Divisions of the Appendicular Skeleton

Some of the anatomy that you currently know may be incorrect.

Note that the lower arm is proximal to the elbow.

Note that no part of the leg is located above the knee.

The thigh is proximal to the knee and the leg is distal to the knee.

Bone terms:

- We will learn to identify muscles by their bony attachments.
- A muscle extends from an attachment on one bone to an attachment on another.
- Joints are formed from bony projections.
- Arteries, veins, and nerves can travel in various holes through bones.

Bony projections that help to form joints:

- Spine - a sharp or pointed projection
- Process - a rounded projection
- Tubercle - a small rounded projection
- Tuberosity - a large rounded projection
- Crest - a narrow ridge of bone, usually prominent
- Line - a narrow ridge of bone, smaller than a crest
- Trochanter - a large bump or hump
- Epicondyle - a raised area above the articular surface
- Spina - a sharp or pointed projection
- Ridge - a rounded projection

Openings into or through bone:

- Sinus - a hollow, curve, or channel
- Foramen - an aperture or perforation
- Meatus - a passage or channel
- Canal - a duct or channel
- Fissure - a cleft, sulcus, or slit
Bone terms:

ANOTHER WAY TO THINK ABOUT THIS:

A hole in a bone: 
- if round... a Foramen
- if slit-like... a Fissure
- if tube-like... a Canal or Meatus
- if a hollow space... a Cavity or Sinus

A depression in a bone: 
- if small... a Fovea
- if large or deep... a Fossa
- if moon-shaped... a Notch

Sinus

An “empty” space in an organ.
- Paranasal Sinuses (Air)
- Dural Sinuses (Blood)
- Coronary Sinus (Blood)
Muscles can only contract linearly.

A muscle will move two bones closer together

Muscles

SKELETAL ATTACHMENTS:

- **Origin**
  - Axial skeleton
  - Anchoring point
  - doesn’t move
  - Proximal

- **Insertion**
  - Appendicular skeleton
  - mobile bone

Muscles…and their SKELETAL ATTACHMENTS:

- **Origin**
  - Axial skeleton
  - Anchoring point
  - doesn’t move
  - Proximal

- **Insertion**
  - Appendicular skeleton
  - mobile bone
Abduction = movement away from midline

Adduction = movement toward midline

Flexion = movement of palmar/plantar surface towards limb.

Extension = increasing the angle of a joint

 Movements:

- Epimysium (Gk. Digits = “of the digits”). Any muscle that moves the fingers or toes.
- Deltoid = “shaped like a triangle - the Greek letter delta or Δ”
- Coracobrachialis = A muscle extending from the coracoid process to the humerous.
- Buccinator = “bugler” A muscle of facial expression.
- Brevis = “brief” or “short”
- A muscle extending from the humerus to the ulna.
- Magnus (L. “huge”) Adductor magnus is the largest of the adductor muscles.
- Levator Scapulae = “Elevator of the scapula”
- Infraspinatus
- Iliacus = “a muscle of the iliac bone”
- Hallucis (Hallux = “great toe”). A combination form of Pollicus pedis or “thumb of the foot”
- Gracilis (L. “slender or graceful”) A long slender adductor muscle.
- Biceps brachii and biceps femoris have two heads.
- Biceps (L. bi = “2” + cephalos = “head”). The superficial covering of a muscle.
- Fixators: Muscles that help stabilize other muscles – need to do action.
- erector spinae = “muscles that keep the spine (vertebrae) erect”.
- Latissimus dorsi (L. latus = “arm”).

Attachments:
- Soleus – shaped like sole (the fish) minora
- Maximus – largest
- Longus – long
- Quadratus – square

MUSCLES:

Muscles are Named in many ways:

Shape:
- Deltoid – triangular
- Quadratus – square
- Longus – long
- Maximus – largest
- Minor – smaller
- Soleus – shaped like sole (the fish)

Action:
- Masseter – masticate or chew
- Adductor magnus – largest adductor of the thigh
- Levator scapulae – elevates the scapula

Location:
- Temporalis – temporal bone
- Biceps brachii – two-headed muscle of the arm

Sternocleidomastoid = from sternum to mastoid
Fibularis longus – long muscle of the fibula

MUSCLES:

Muscles are Named in many ways:

Nerve = “nerve”
- Nerve (L. nervus)
- Ulna = “ulna”
- Ulna (Gk. ulna = “hand"
- Pec = “pectoralis"
- Pectoral = “pectoralis"
- Pectoralis = “pectoralis"
- Pectoral (L. pectus = “chest"
- Capit = “head"
- Capit (Gk. caput = “head"
- Star = “star"
- Star (L. stella = “star"
- Star (Gk. stella = “star"
- Sterno = “sternum"
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Compound Terms

- Prefixes
- Suffixes
- Relative Terms

An example:
- Epidermis: "Upon the Dermis"
- Dermis
- Hypodermis: "Below the Dermis"

Common Prefixes

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi-/Di-</td>
<td>Two</td>
</tr>
<tr>
<td>Tri-</td>
<td>Three</td>
</tr>
<tr>
<td>Quad-</td>
<td>Four</td>
</tr>
<tr>
<td>Epi-/Hyper-/Supra-/Super-</td>
<td>Upon or Above</td>
</tr>
<tr>
<td>Hypo-/Infra-/Sub-</td>
<td>Below</td>
</tr>
<tr>
<td>Intra-</td>
<td>Inside</td>
</tr>
<tr>
<td>Extra-</td>
<td>Outside</td>
</tr>
</tbody>
</table>

Prefixes and Suffixes:

Common roots are helpful to deduce the meaning of structures:

A- without – azigos, not paired
Ab - away from - ab duct, take away
Ad - toward - adduct, move towards
Arth- - joint - arthroscopy, viewing a joint
Ail- - afferent, towards spinal cord
Albi - white - linea alba, white line
Axilla - arm pit
Bi - two - biceps brachii, two-headed
Branch - arm - biceps brachii, of the arm
Broncho
Calyx - a bladder or cyst - cystic artery, artery to gall bladder
Cost - rib - intercostal, between ribs
Cune - wedge - cuneiform, a wedgeshaped bone
Dem - half - demifacet, half facet
Dura - durable - dura mater
Eff - away, out - efferent, away from spinal cord
Endo - within - endocardium, inner lining of heart
Epi - upon - epicardium, living on the heart
Prefixes and Suffixes:
Common roots are helpful to deduce the meaning of structures:
(this list are examples, not comprehensive)

- form – resembling – fusiform, spindle-shaped
- Gastro – stomach – gastric artery
- Glosso – tongue – hypoglossal, under the tongue
- Hepato – liver – hepatic duct
- Hypo – beneath – hypodermis
- Infra – below – infraspinatus, below spin of scapula
- Isomus – greatest – latissimus, widest of the back
- Labi – lip – labrum, lip-shaped cartilage
- Mast – mam, breast – mastoid process, shaped like a breast
- Medial – towards the middle
- Median – down the middle, think of the median of the highway
- Meningio – membrane around brain or spinal cord, meninges – dura, pia and arachnoid mater
- Myo – muscle – myometrium, muscle of the heart
- Oculo – eye – oculomotor, ophthalmic artery
- Odonto – tooth (also dens) – odontoid process, shaped like a tooth
- Osteo – bone – osteology, study of bones
- Oto – ear – parotid, near the ear
- Palmar – palm of foot or hand
- Para – near
- Pecto – chest – Pectoralis major, large muscle of chest
- Peri – around – perirenal fat
- Pes – feet, pod – dorsalis pedis, artery to dorsum of foot
- Phag – eat – esophagus, through which to eat
- Plantar – sole of foot
- Pneumo – air – pulmonary artery
- Post – after – post-ganglionic, after the ganglion
- Pre – before – pre-ganglionic, before the ganglion
- Quad – four – quadriceps femoris, 4-headed muscle of thigh
- Ramus – branch – primary division of a nerve
- Recto – straight – rectus femoris, straight muscle of the thigh
- Retro – behind – retroperitoneal space, behind pudenal bone
- Salpingo – shaped like a trumpet
- Stomato – shaped like a mouth
- Semi – half – semitendinosus – half tendinous muscle
- Serrate – serrated – serratus anterior, jagged
- Sterno – sternum – sternoclavicular joint
- Sub – under – subscapularis, a muscle under the scapula
- Supra – super – above – supraspinatus, above clavicle
- Sym, syn – together – pubic symphysis is where pubic bones meet
- Thorac – thorax – cervicothoracic ganglion
- -otomy – to cut – appendectomy, remove vermiform appendix
- Trans – cross – transverse cervical, across the neck
- Tri – three – triceps, three-headed muscle of arm
- Tunica – layer or coat – tunica media, the middle layer
Introduction to Nerves……

The Nervous System

Central Nervous System (CNS)
- Brain and spinal cord

Peripheral Nervous System (PNS)
- Cranial nerves
- Spinal nerves
- Autonomic nervous system

Sensory (afferent)
- Somatic sensory
  - General: Aware of sensory information (GSA)
  - Special: Vision, smell, hearing, equilibrium (SSA)
- Visceral sensory
  - General: Unaware of sensory information from viscera (GVA)
  - Special: Taste (SVA)

Motor (efferent)
- Somatic motor
  - General: Voluntary motor to skeletal muscles (GSM)
  - Special: Motor to skeletal muscles (GSM)
- Visceral motor
  - General: Involuntary motor to smooth muscle, cardiac muscle, and glands (GVM)
  - Special: Autonomic nervous system (ANS)

- Parasympathetic (rest and digest)
- Sympathetic (fight and flight)
ventral root (motor)
dorsal root (sensory)
Dorsal root ganglion (DRG)
dorsal ramus
ventral ramus
spinal nerve
dorsal ramus
ventral ramus
spinal nerve
Medial cutaneous nerves of arm and forearm:
- Musculocutaneous (thoracodorsal)
- Middle subscapular
- Lower subscapular

Brachial Plexus:
- Cords:
  - Median: middle
  - Lateral, medial, posterior: to artery
The Nervous System

Central Nervous System (CNS): Brain and spinal cord

Peripheral Nervous System (PNS): Cranial nerves, spinal nerves, and Autonomic nervous system

Somatic sensory

- General: Aware of sensory information (GSA)
- Special: Vision, smell, hearing, equilibrium (SSA)

Visceral sensory

- General: Unaware of sensory information from viscera (GVA)
- Special: Taste (SVA)

Somatic motor

- General: Voluntary motor to skeletal muscles (GSE)

Visceral motor

- General: Involuntary motor to smooth muscle, cardiac muscle, and glands (GVE)

Autonomic Nervous System (ANS)

- Parasympathetic (rest and digest)
- Sympathetic (fight and flight)

The Autonomic Nervous System or ANS...

Sympathetic + Parasympathetic...

Introduction to Cardiovascular System
In contrast to arteries, there are deep and superficial veins. Deep veins run with arteries, superficial veins are somewhat visible through epidermis.

Conventions: Artery-capillary-Vein, Artery = Away, Trunk - bifurcate, where it goes, not comes from. Common = will branch. Profunda = deep
That's it for now!

Thank you for your attention.

Don't forget.

Your faculty and TAs are here to help you learn anatomy - to be the best physician you can be!