Bones and Bone Markings

The human skeleton is made of roughly 206 bones in addition to cartilages, joints, and ligaments. Together, these structural components perform a number of important functions for the human body including providing support and protection, allowing for locomotion, as well as storing minerals, yellow marrow and the hematopoietic stem cells found in red marrow.

The skeleton is divided into two portions or regions: the axial skeleton and the appendicular skeleton. The axial skeleton includes the bones of the skull, vertebral column, and the thoracic cage; while the appendicular skeleton is formed by the bones of the limbs (i.e. appendages): the pectoral (shoulder) girdles, upper limbs, pelvic girdle, and lower limbs.

Many of the bones include external markings or features – projections, depressions, and openings. Depending on their structure, these markings may serve as attachment sites for muscles, ligaments, and tendons or as passageways for blood vessels and nervous tissue.

Each bone and marking has a unique structure and performs a unique function for the human body. In anatomy, anything that has a unique structure and/or function gets its own name. You will be provided with lists of the names of bones and bone markings found in/on the human skeleton. You will be responsible for naming all bones and markings on these lists from memory on our lab practical – you will NOT get to use a word bank during the practical.

When learning the names of bones and markings for the first time, I suggest doing these three things:

1. **Try to figure out what the names of the bones/markings mean.** Trying to memorize funny-looking, funny-sounding words will drive you crazy, but if you figure out why the bones/markings were named a certain way, you will hold onto that knowledge much longer.
   a. Take the styloid process for example. The word process means a projection (something sticking out of the bone). The word styloid has the same prefix sound (sty-) as stylus and stiletto, which means to be sharp and pointy and the -oid suffix which means like or resembling. Taken together, this lets us know that styloid process actually means a kind of sharp, pointy piece of bone sticking out.

2. **Draw your own diagrams.** The diagrams in the book can be stress-inducing since each diagram labels something like 25 different structures. Our brains can only process about 7 pieces of information at a time (hence why phone numbers are 7 digits long). If you make your own diagrams, you can decide how many things to label on each diagram. In addition, drawing things yourself brings other areas of your brain into the learning process – meaning you’re not relying solely on memorization.

3. **Practice, practice, practice.** Get together with a learning partner and practice as much as possible – even when you’re not in class. Practice on the three-dimensional models as much as possible – it’s hard to learn only using something two-dimensional (diagrams) and then test on something three-dimensional (models).
Axial Skeleton

The Skull

*The skull is a set of articulated bones. There is no one single bone called skull*

- Flat bones of the cranium
  - Frontal
  - Supraorbital foramen/notch
  - Glabella
  - Parietal
  - Temporal
    - Zygomatic process
    - External acoustic meatus/canal
    - Styloid process
    - Mastoid process
  - Occipital
    - Foramen magnum
  - Sphenoid
    - Sella turcica
  - Ethmoid
    - Crista galli

- Facial Bones
  - Mandible
    - Body
    - Ramus
    - Mental foramen
  - Maxilla
    - Infraorbital foramen
    - Incisive foramen/fossa
  - Palatine
  - Zygomatic
  - Nasal
  - Vomer
  - Hyoid
    - Note: the hyoid bone is NOT a bone of the face.

- Sutures
  - Sagittal suture
  - Coronal suture
  - a.k.a. Frontal Suture
  - Squamous suture
  - a.k.a Temporal-Parietal
  - Lambdoid suture
  - Sutural bones
    - a.k.a. Wormian bones

The Vertebral Column

*The vertebral column is divided into 5 regions: Cervical, Thoracic, Lumbar, Sacral, and Coccygeal*

- Vertebral Markings
  - Body
  - Transverse process
  - Spinous process
  - Vertebral foramen

- Vertebrae
  - Cervical / C1-C7
    - Atlas / C1
    - Axis / C2
    - Have short spinous processes that are often bifurcated, and transverse foramen for vertebral arteries.
  - Thoracic / T1-T12
    - Have heart-shaped bodies and larger transverse processes with costal demifacets to articulate with ribs.
  - Lumbar / L1-L5
    - Have massive block-like bodies; short, thick spinous processes; and thin, tapered transverse processes.
  - Sacrum
  - Coccyx
    - 1-3 pieces (end of vestigial tail)

The Bony Thorax

- Sternum
  - Xiphoid process
- Ribs
  - True ribs
    - Ribs 1-7
  - False ribs
    - Ribs 8-10
  - Floating ribs
    - Ribs 11-12

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Appendicular Skeleton

The Pectoral Girdle
- Scapula
  - Acromion process
  - Coracoid process
  - Glenoid cavity
  - Spine of the scapula
- Clavicle

The Arm
- Humerus
  - Head
  - Greater tubercle
  - Lesser tubercle
  - Deltoid tuberosity
  - Trochlea
  - Capitulum

The Forearm
- Radius
  - Head of radius
  - Radial tuberosity
  - Radial styloid process
- Ulna
  - Olecranon process
  - Ulnar styloid process

The Hand
- Carpals
  - Scaphoid
  - Lunate
  - Triquetrum
  - Pisiform
  - Trapezium
  - Trapezoid
  - Capitate
  - Hamate
- Metacarpals
- Phalanges

The Pelvic Girdle
- Hip bone / coxal bone
  - Ilium
    - Iliac crest
    - Anterior superior iliac spine
    - Acetabulum
  - Ischium
    - Ischial tuberosity
  - Pubis
    - Obturator foramen
    - Pubic symphysis

The Lower Limb: The Thigh
- Femur
  - Femoral head
  - Neck
  - Fovea capitis
  - Greater trochanter
  - Lesser trochanter
  - Lateral condyle
  - Medial condyle

The Lower Leg
- Patella
- Tibia
  - Intercondylar eminence
    - a.k.a tibial spine
  - Tibial tuberosity
  - Medial malleolus
- Fibula
  - Lateral malleolus

The Foot
- Tarsals
  - Calcaneus
  - Talus
  - Navicular
  - Cuneiforms
    - Medial
    - Intermediate
    - Lateral
  - Cuboid
- Metatarsals
- Phalanges

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Anterior View of Left Hand

Bones
- Carpals
  - Scaphoid
  - Lunate
  - Triquetrum
  - Pisiform
  - Trapezium
  - Trapezoid
  - Capitate
  - Hamate
- Metacarpals
- Phalanges

Mnemonic Devices
- Some Lovers Try Positions
  That They Can't Handle
- Sally Left The Party To Take
  Cathy Home
Bones

- Tarsals
  - Calcaneus
  - Talus
  - Navicular
  - Medial Cuneiform
  - Intermediate Cuneiform
  - Lateral Cuneiform
  - Cuboid
- Metatarsals
- Phalanges

Mnemonic Devices

Children That Never March
In Line Cry

Chuck Took Nudey
Magazines Into Lucy's Church