

Identifying Left or Right Bones

Tutor Tool designed
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Introduction

Of all the student learning objectives covered in the skeletal unit of an anatomy course, perhaps the least discussed and most challenging for students is the identification of a left or right bone. Already faced with the challenge of learning numerous bony landmarks, students often neglect this portion of the unit because it is perceived as being too large a time commitment for the potential payoff. However, given concrete guidance and a method adaptable to their needs, learning to distinguish between a left or right bone should be relatively simple.

Target Audience

Aside from anyone taking a human anatomy course, students interested in anthropology and forensic science would benefit from using this tool, as reconstruction of human remains is sometimes necessary.

User Guide

It is suggested that the student learn the bony landmarks before learning to distinguish left or right. With that being said, only a few obvious landmarks are required per bone. Most bones require only two landmarks for reference, but others may be less clear, with greater confidence being gained by knowing a third landmark. The key feature we will be exploiting is the bilateral symmetry of the skeleton. Regardless of which side of the body a bone belongs to, the anterior/posterior, medial/lateral, and superior/inferior qualities of the landmarks on the bone remain constant. Therefore, all that is necessary is for students to identify a landmark of their choice for each of these planes.

If the student is familiar with the general orientation of the bones and it is self-evident which side is the top or bottom, the landmark indicating superior/inferior may be disregarded. Once the student has positioned the bone such that the landmarks are oriented in the correct way (example: anterior landmark is anterior, medial landmark is medial), the position of the bone on the body will be known. Students are encouraged to pick landmarks they are most familiar with, but examples for the most common bones are provided.

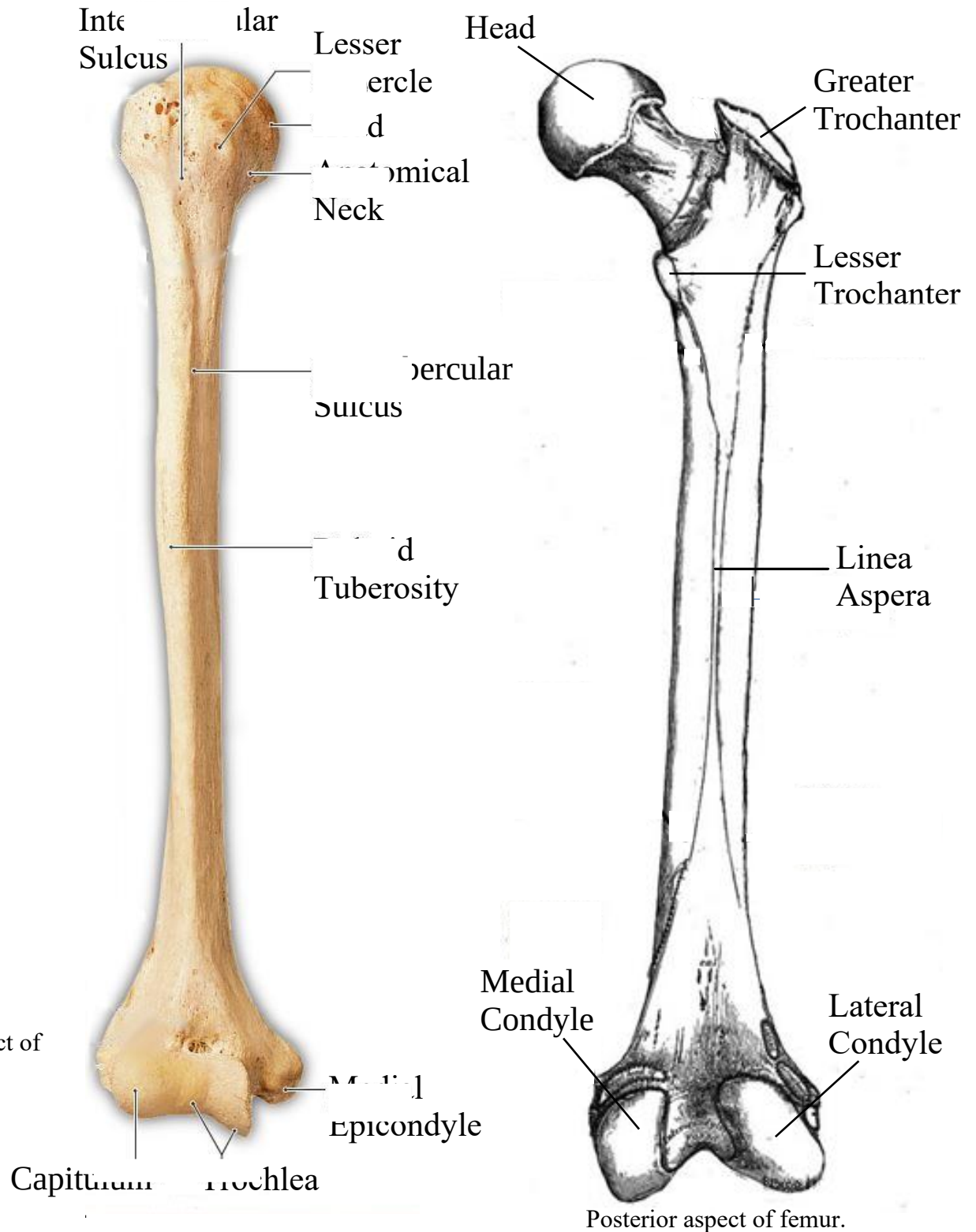
Examples for the Major Bones:

Humerus

Because the head of the humerus inserts into the glenoid cavity, the head will always face medially. The trochlea and capitulum (condyles of the humerus) will always face anteriorly. If one orients the humerus so that the head faces the midline of the body and the trochlea faces anteriorly, the left/right position of the bone on the body will be revealed.

Femur

Like the humerus, the head of the femur inserts into a cavity, forming a ball-and-socket joint. As before, the head will face medially. A good way to determine the anterior and posterior side is to locate the linea aspera: a long, skinny ridge that runs along the posterior side of the femur.



Anterior aspect of humerus.

Posterior aspect of femur.

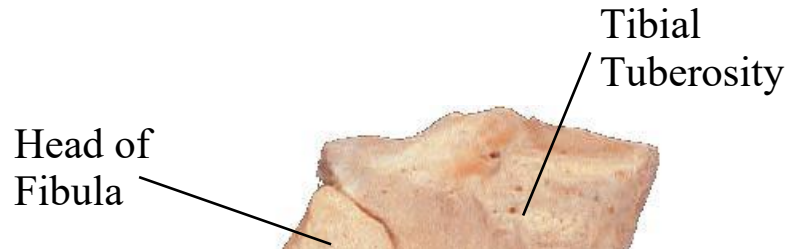
Ulna

Like the radius, the ulna has a styloid process consistent with its location on the antebrachium. The ulnar styloid process, when it is in anatomical position, will always face medially. Alternately, the radial notch of the ulna will always be on the lateral side. The trochlear notch will be on the anterior side.

Radius

The inferior portion of the radius has a styloid process. Similar to the position of the radius on your antebrachium, the styloid process of the radius will always face laterally. One could also locate the ulnar notch of the radius, which is always on the medial side. The radial tuberosity will be visible on the anterior side.



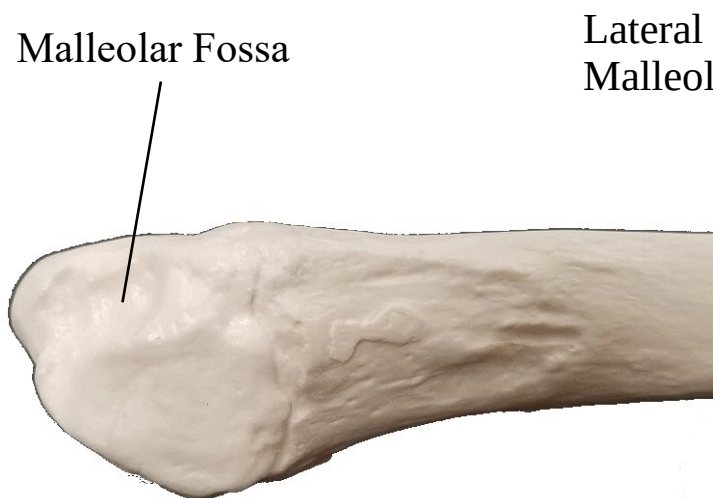


Tibia

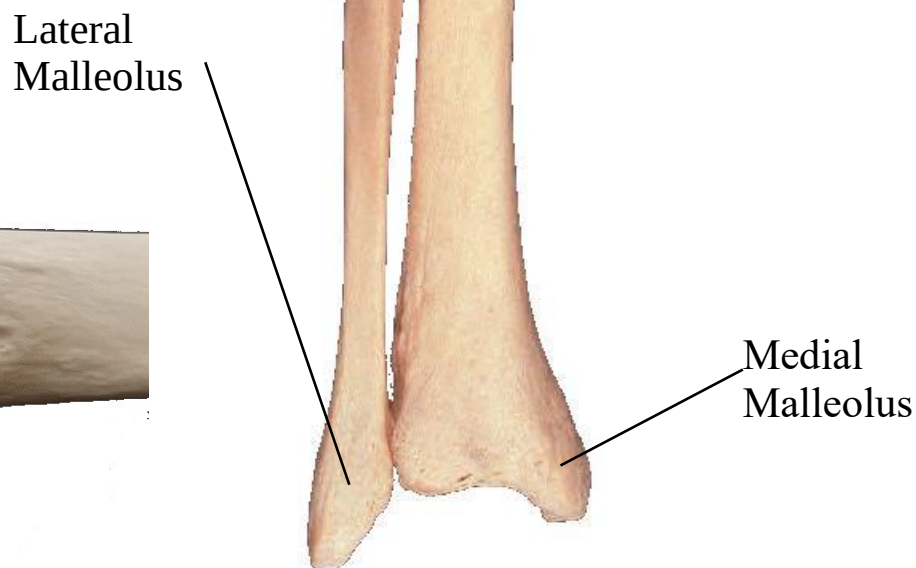
The tibia has a landmark on the inferior end called the medial malleolus, which as the name suggests, is on the medial side. At the superior end of the tibia, one can find a prominent “bump”, the tibial tuberosity, which is anterior.

Fibula

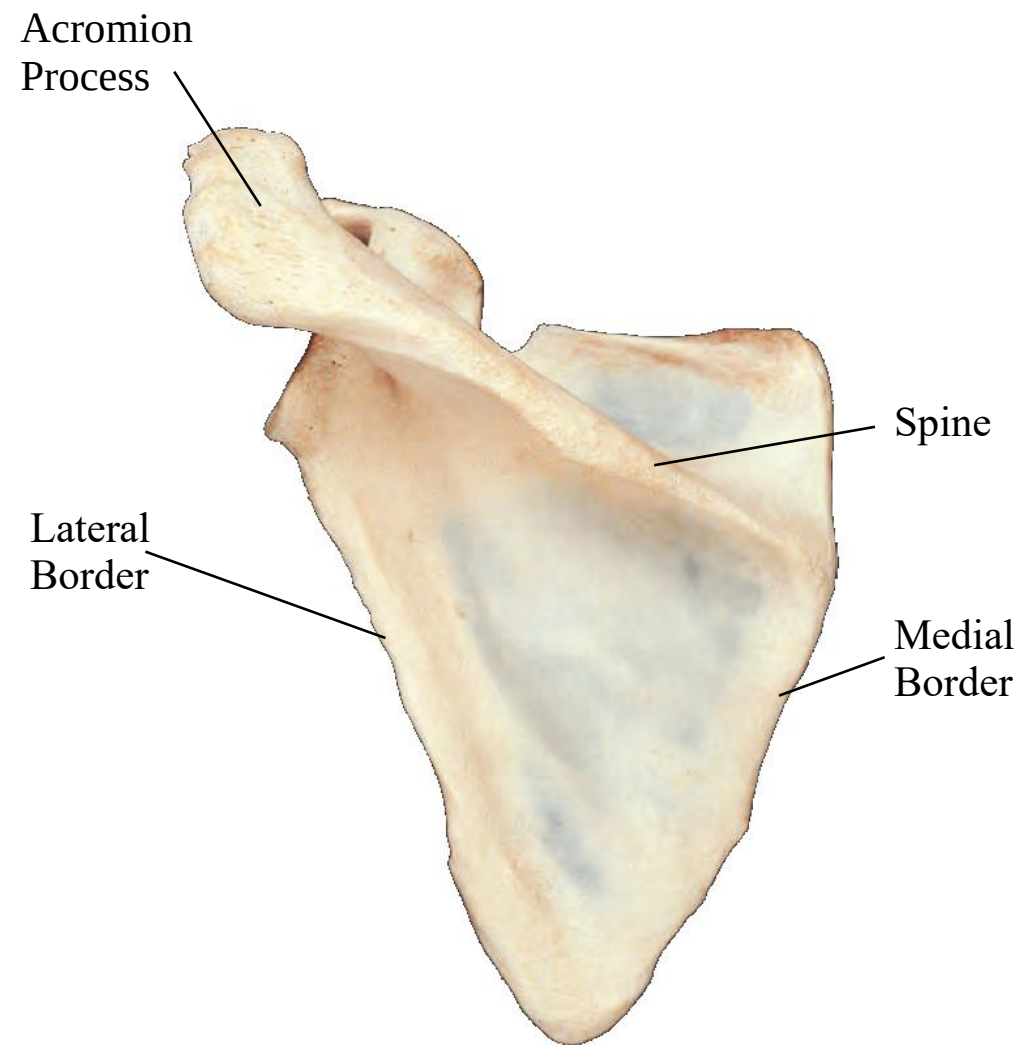
The method for determining left/right for the fibula is better demonstrated than written. One method is to grab the fibula by the head (thicker end) with your right hand, and position the lateral malleolus such that it is to your left. Rotate the fibula until you see the malleolar fossa, which will appear as an indentation. If the fossa faces towards you, the fibula is a right. If it faces away from you, the fibula is a left. This method has been called the “spoon trick” by some.



Close-up view of lateral malleolus.



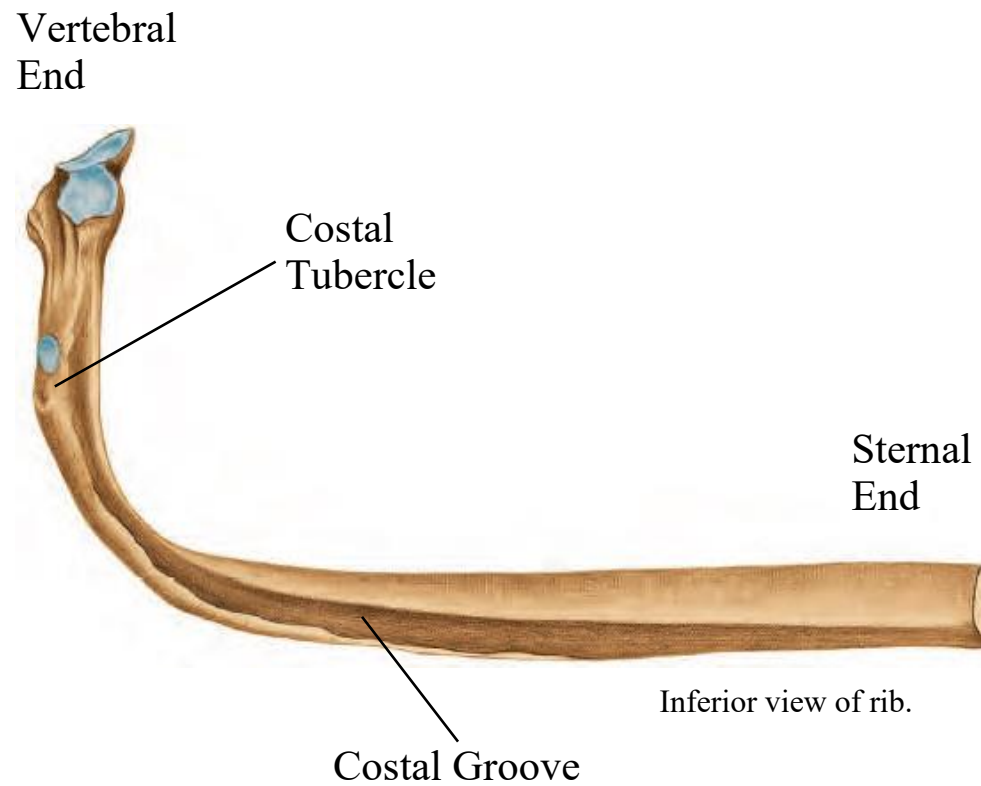
Anterior aspect of fibula and tibia.



Posterior aspect of scapula.

Scapula

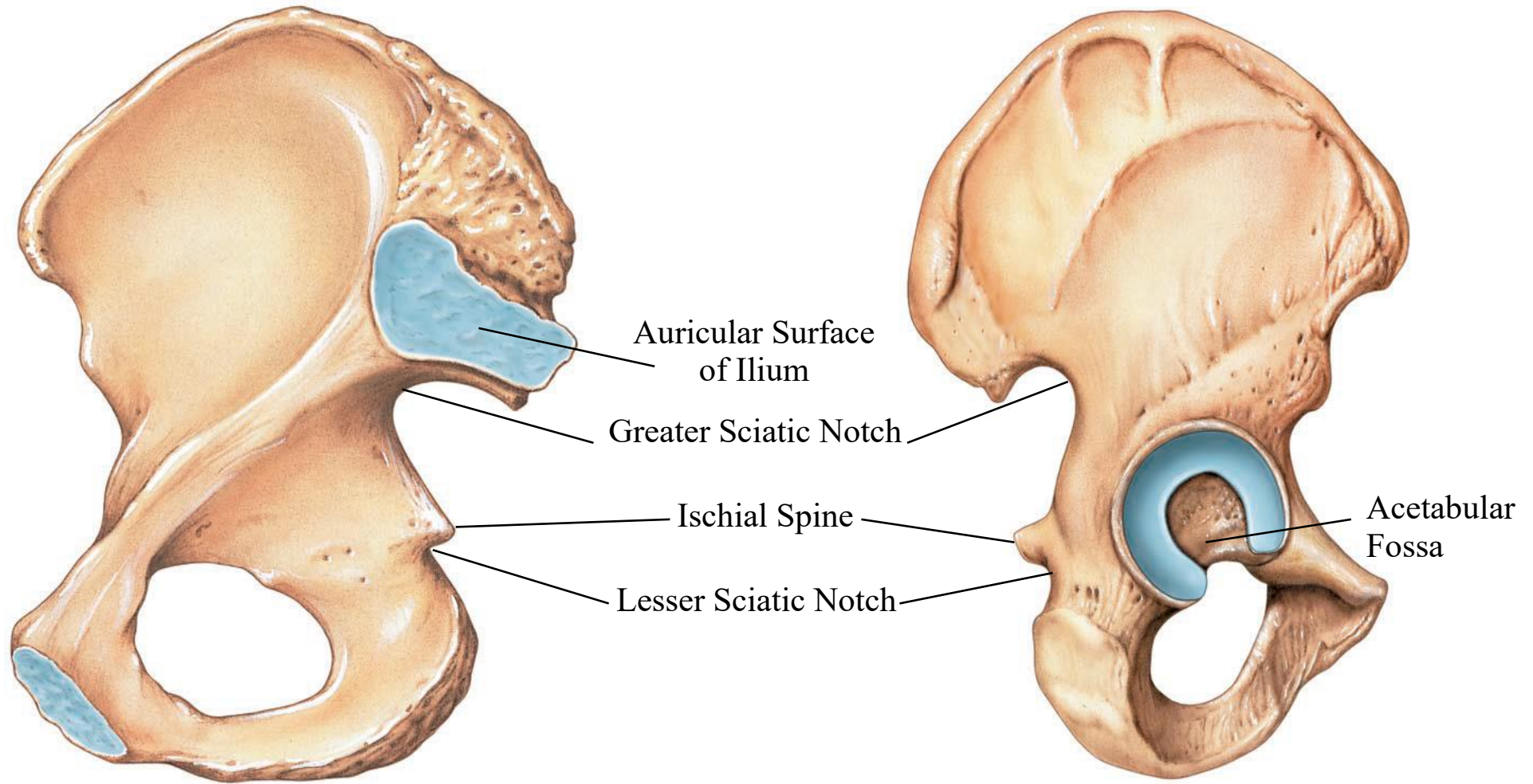
The scapular spine is on the posterior side, and the medial border (the one which is convex) faces medially. One may also locate the glenoid cavity, which is always on the lateral side.



Inferior view of rib.

Rib

If one imagines a rib to be like a walking cane, the more curved end of the rib, the vertebral end, is on the posterior side of the body. One may also find the sternal end on the opposite side, which will be on the anterior side of the body. When looking at the deeper, rougher part of the rib, one will see a long groove, which is called the costal groove. The costal groove will always be on the inferior aspect of the rib.

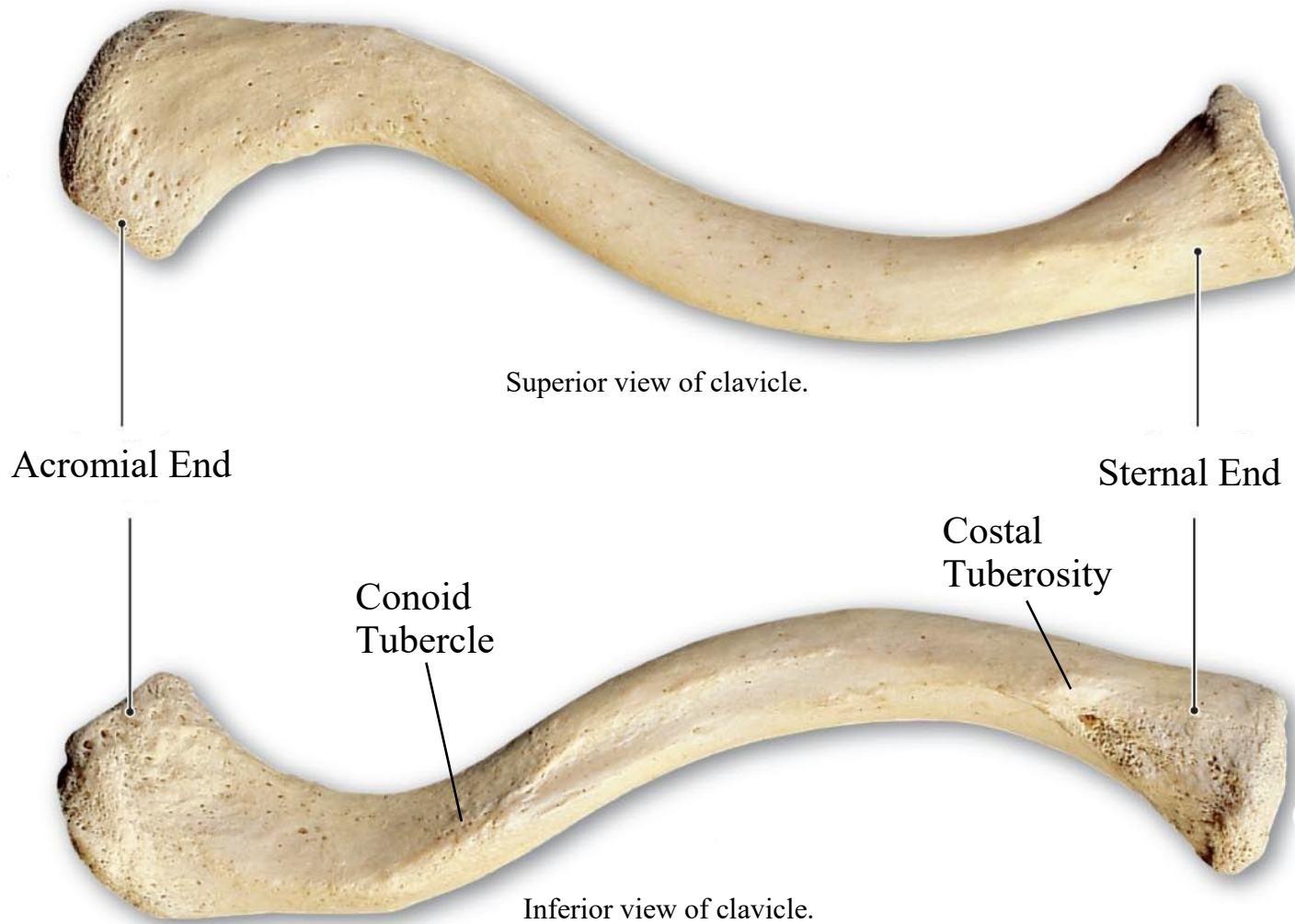


Medial aspect of coxal bone.

Lateral aspect of coxal bone.

There are many ways to determine anterior/posterior on the coxal bone. One could find the ischial spine, sciatic notches, or the auricular surface of the ilium, which will always be posterior.

To locate the medial and lateral aspects of the coxal bone, the simplest way is to find the acetabular fossa, which faces laterally for articulation with the head of the femur.



For the medial/lateral landmark, one could use the acromial side of the clavicle, which is flat and lateral. One could also find the thicker sternal end on the other side, which is medial. The superior side is that which is smoother and lacks the conoid tubercle and costal tuberosity. These landmarks are on the inferior side, which is roughened by them. To find the anterior side, locate the acromial end, which curves in the anterior direction.