

**Spongy  
bone**

**Compact  
bone**

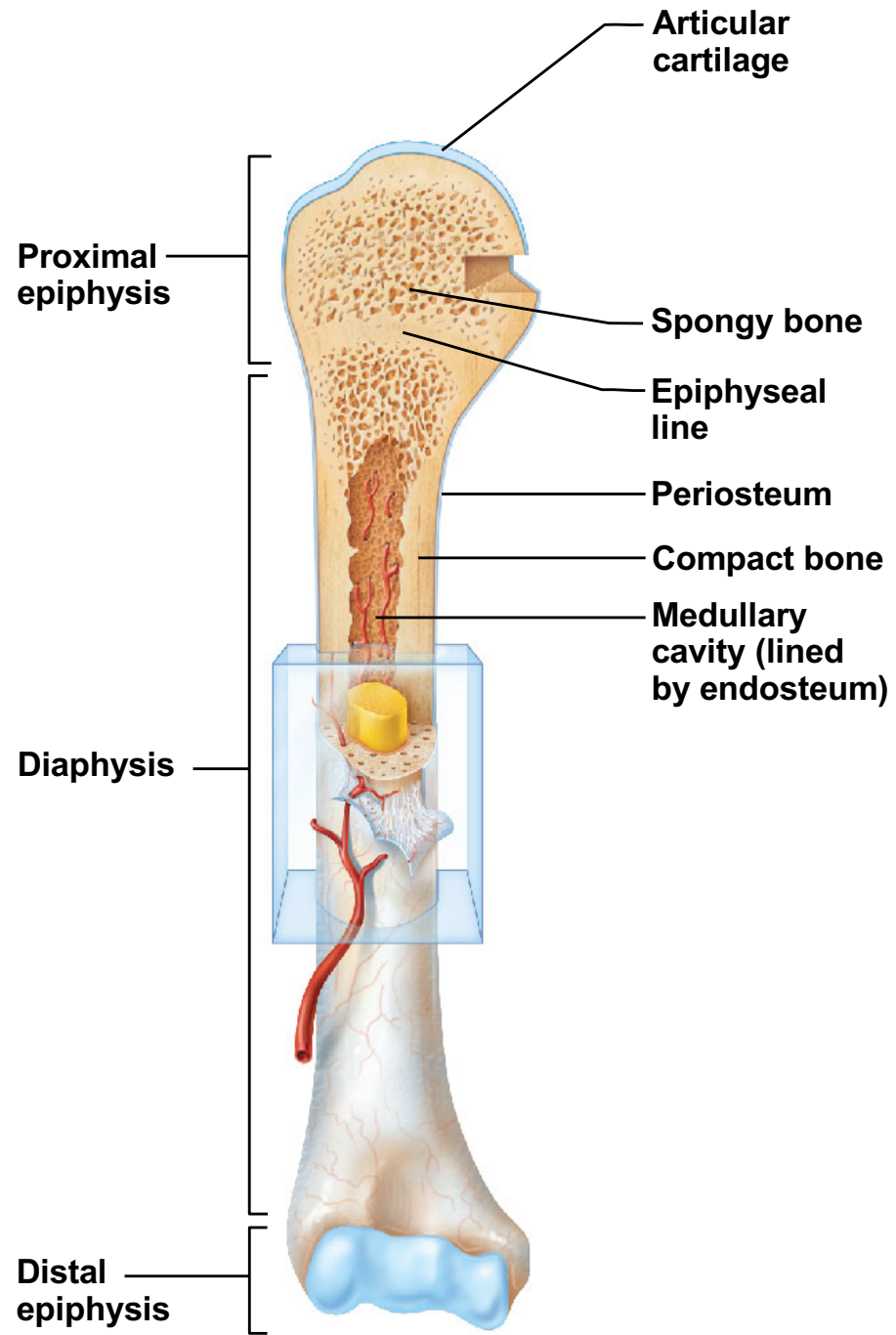


**(a) Long bone (humerus)**

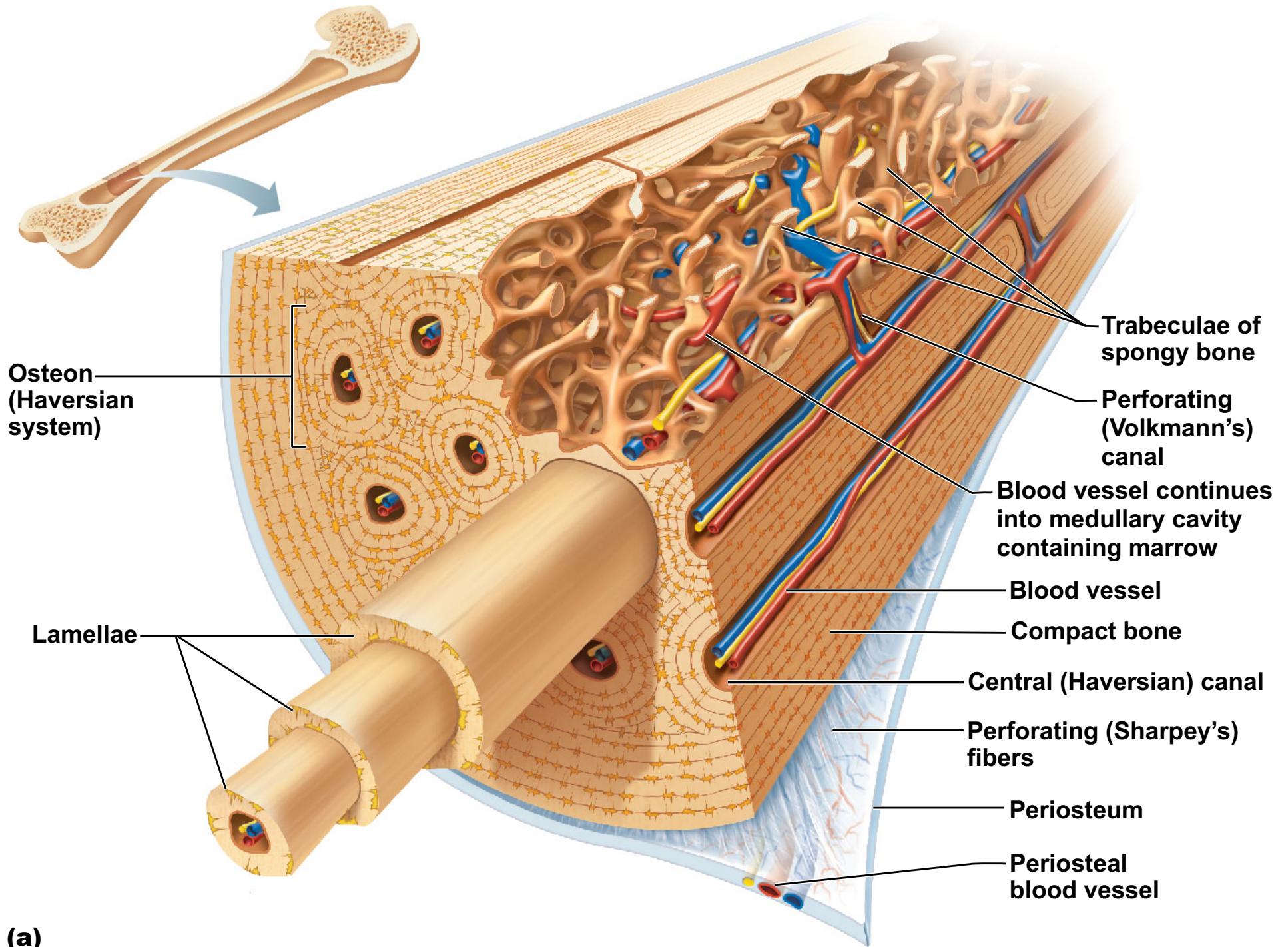
**(b) Flat bone (sternum)**

**(d) Irregular bone (vertebra),  
right lateral view**

**(c) Short bone (talus)**



**(a)**



**Osteon  
(Haversian  
system)**

**Lamellae**

**Trabeculae of  
spongy bone**

**Perforating  
(Volkman's)  
canal**

**Blood vessel continues  
into medullary cavity  
containing marrow**

**Blood vessel**

**Compact bone**

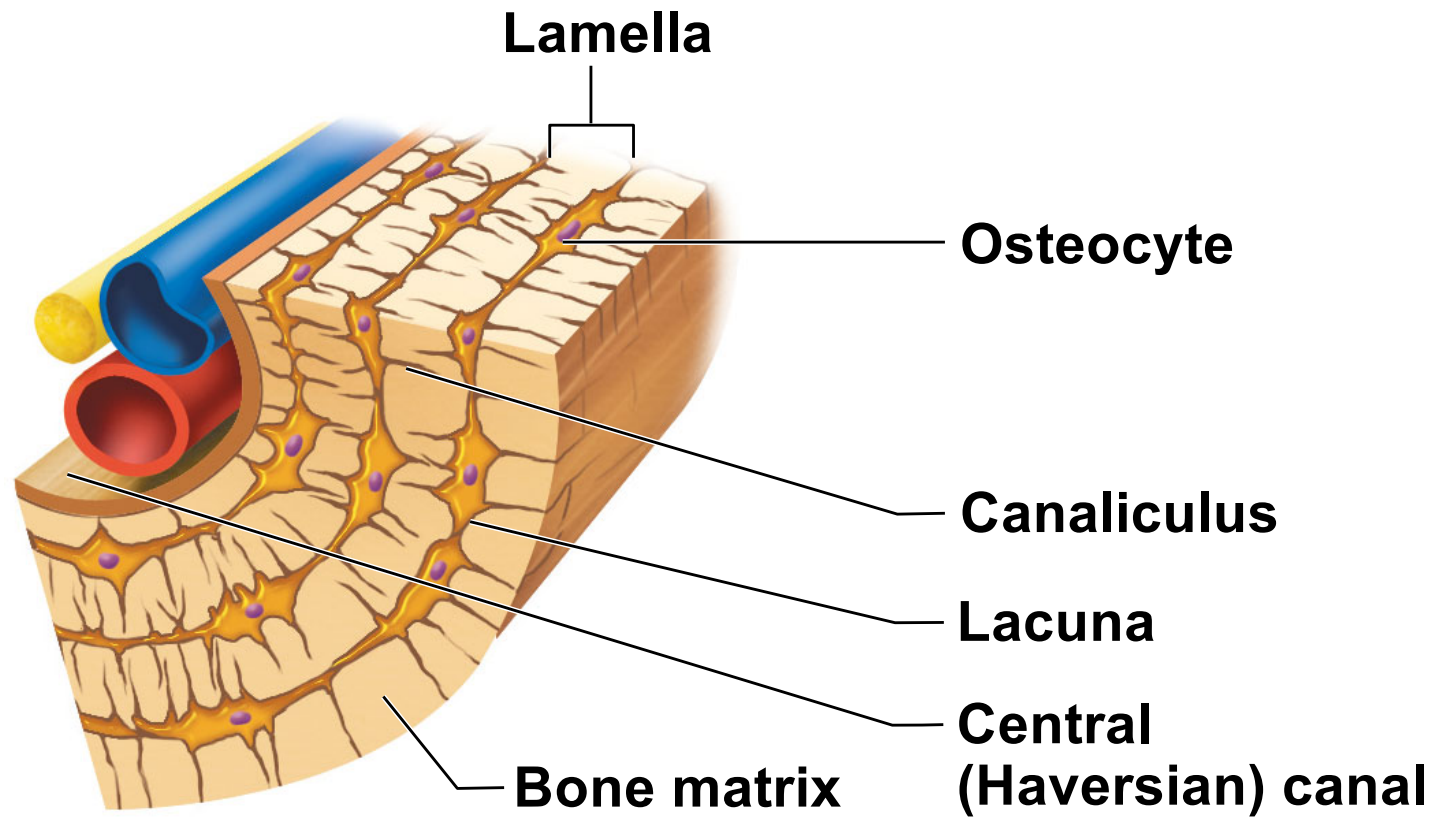
**Central (Haversian) canal**

**Perforating (Sharpey's)  
fibers**

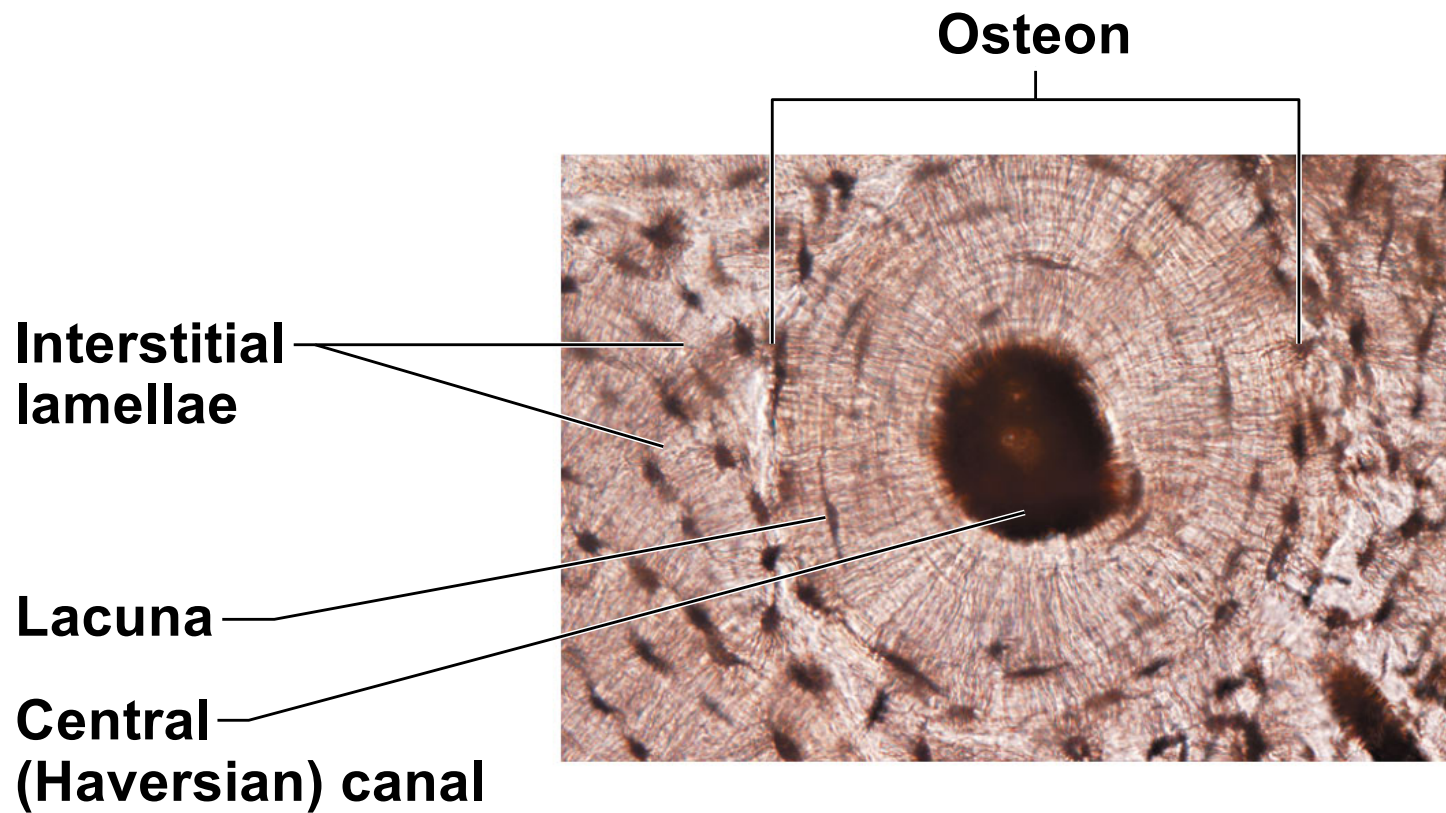
**Periosteum**

**Periosteal  
blood vessel**

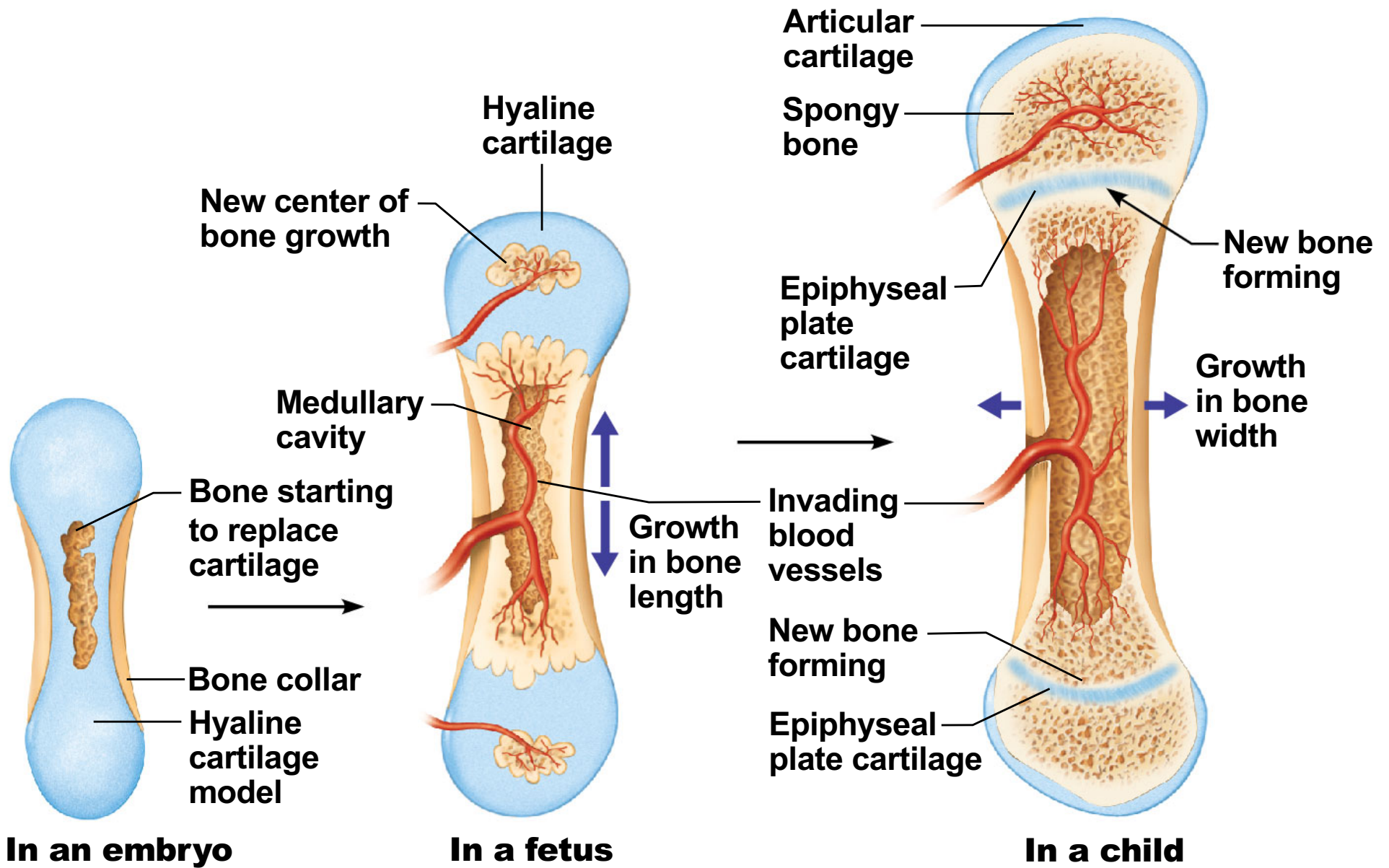
**(a)**



**(b)**



**(c)**



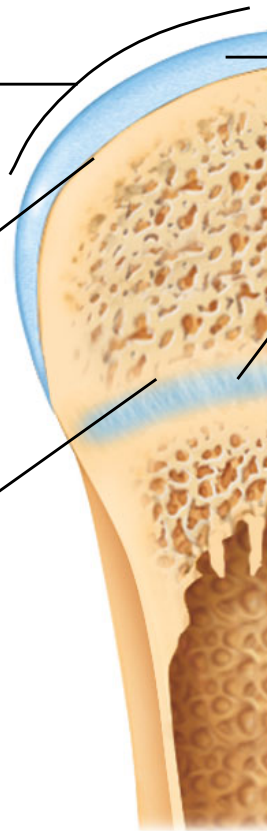
## Bone growth

Bone grows in length because:

① Cartilage grows here.

② Cartilage is replaced by bone here.

③ Cartilage grows here.



Articular cartilage

Epiphyseal plate



## Bone remodeling

Growing shaft is remodeled as:

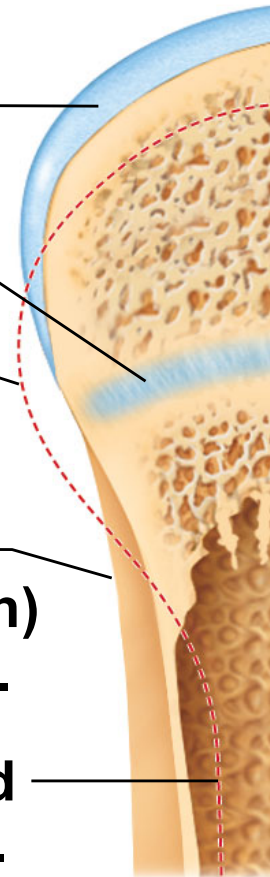
Articular cartilage

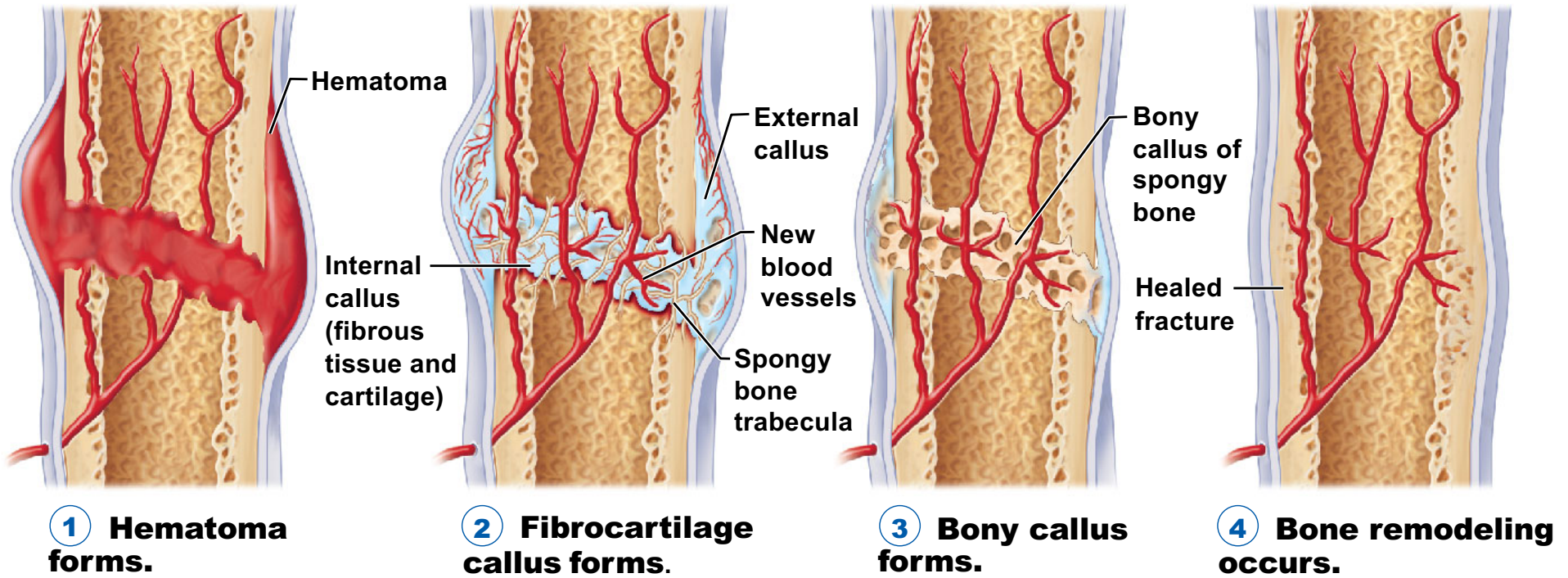
Epiphyseal plate

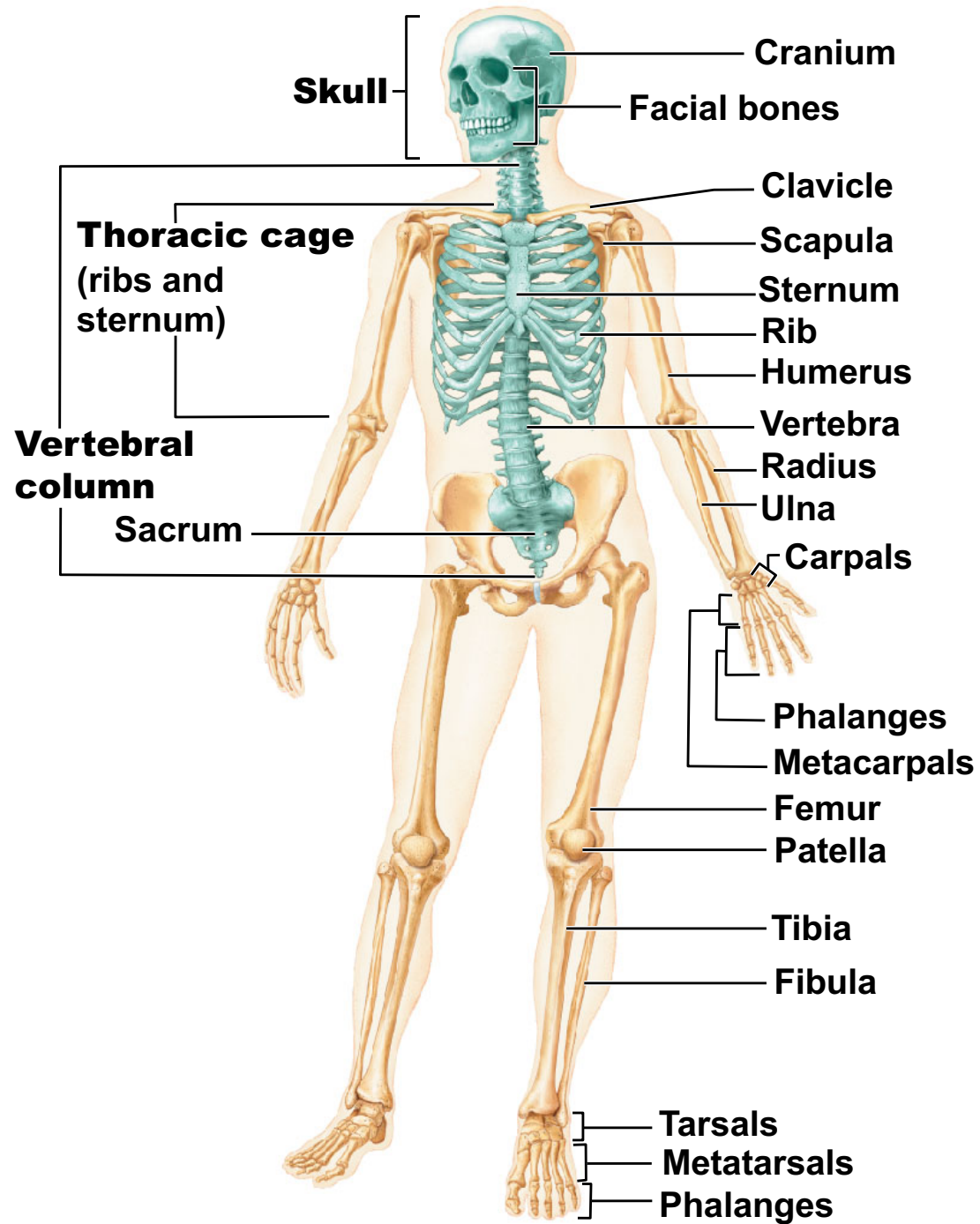
① Bone is resorbed by osteoclasts here.

② Bone is added (appositional growth) by osteoblasts here.

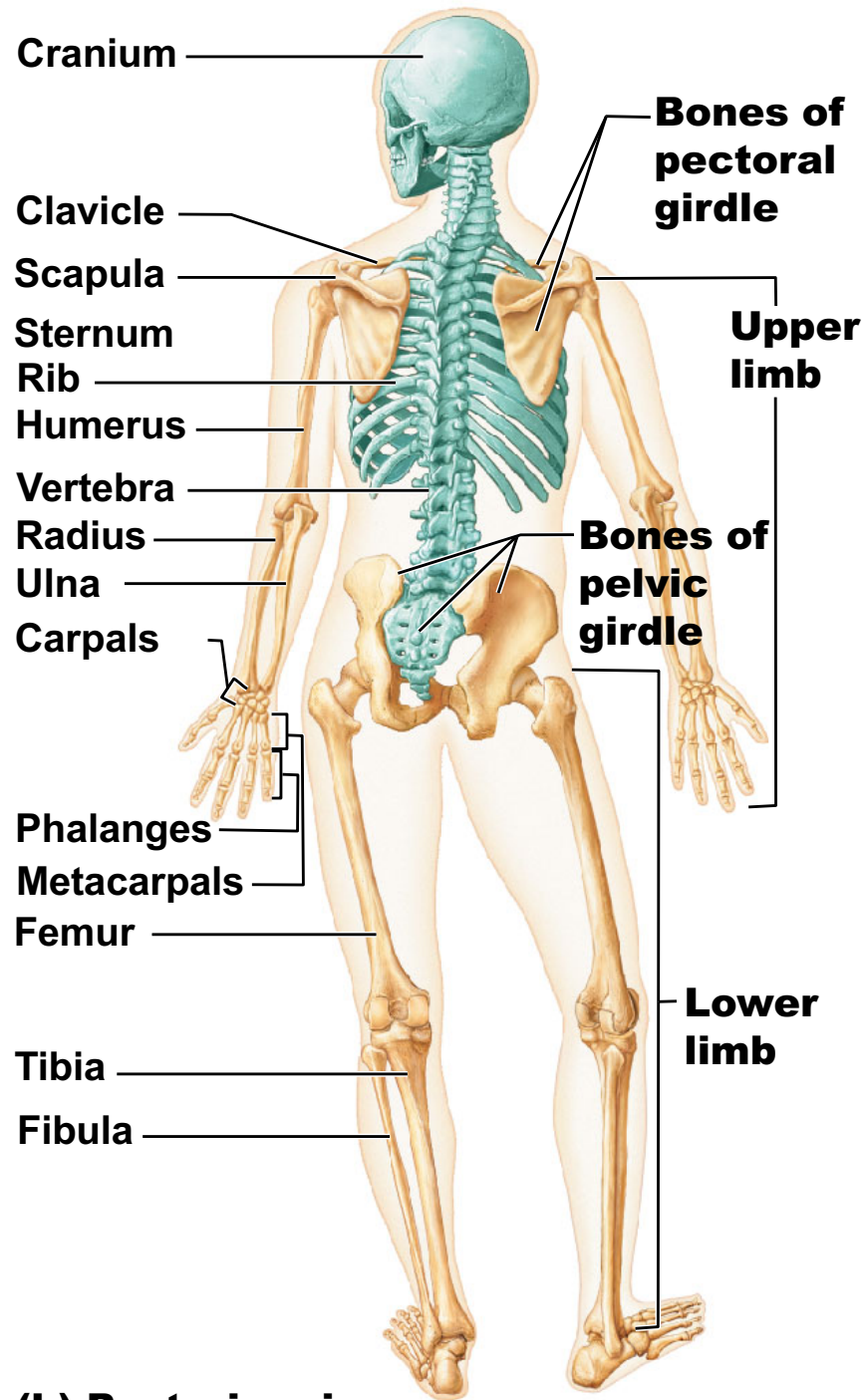
③ Bone is resorbed by osteoclasts here.



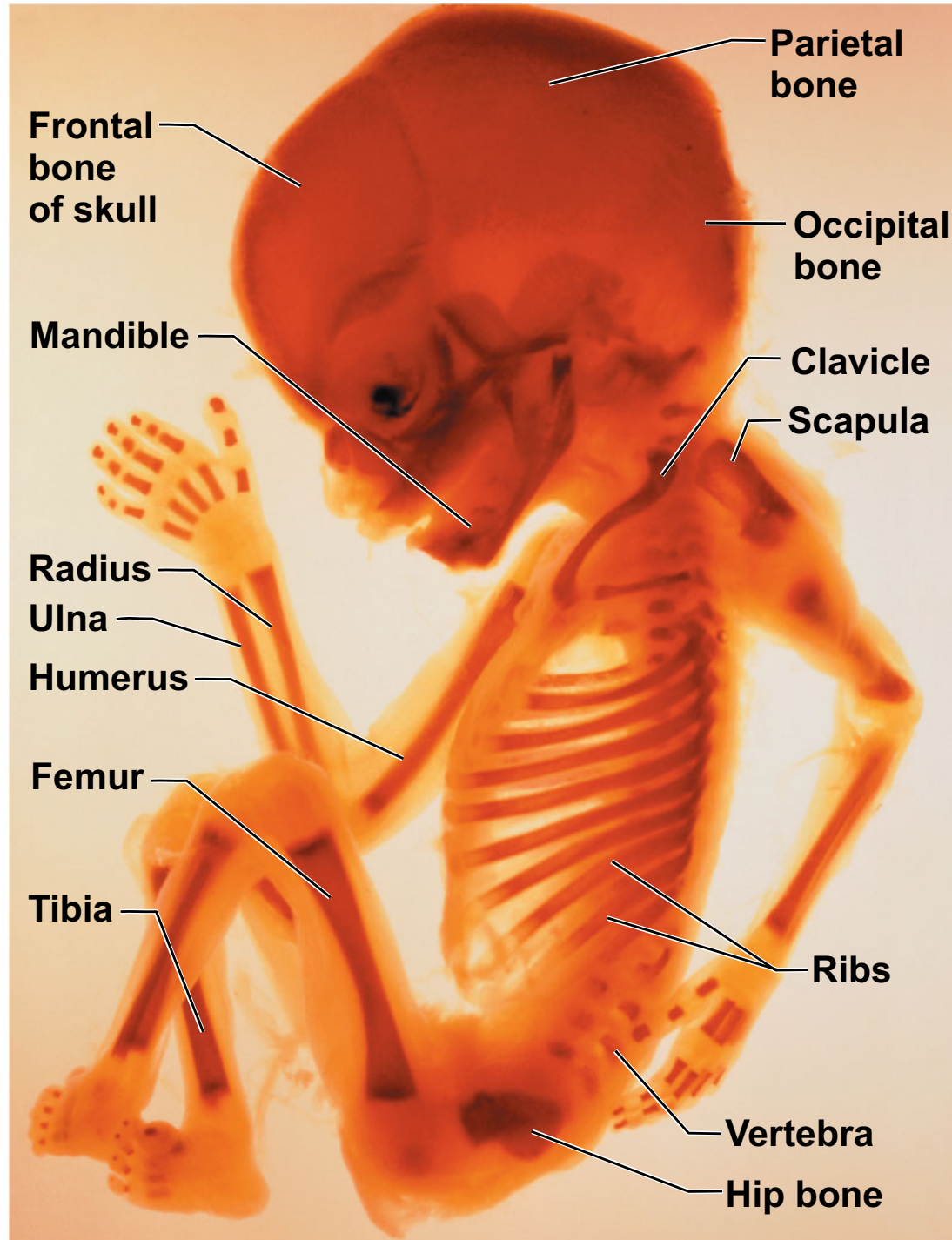


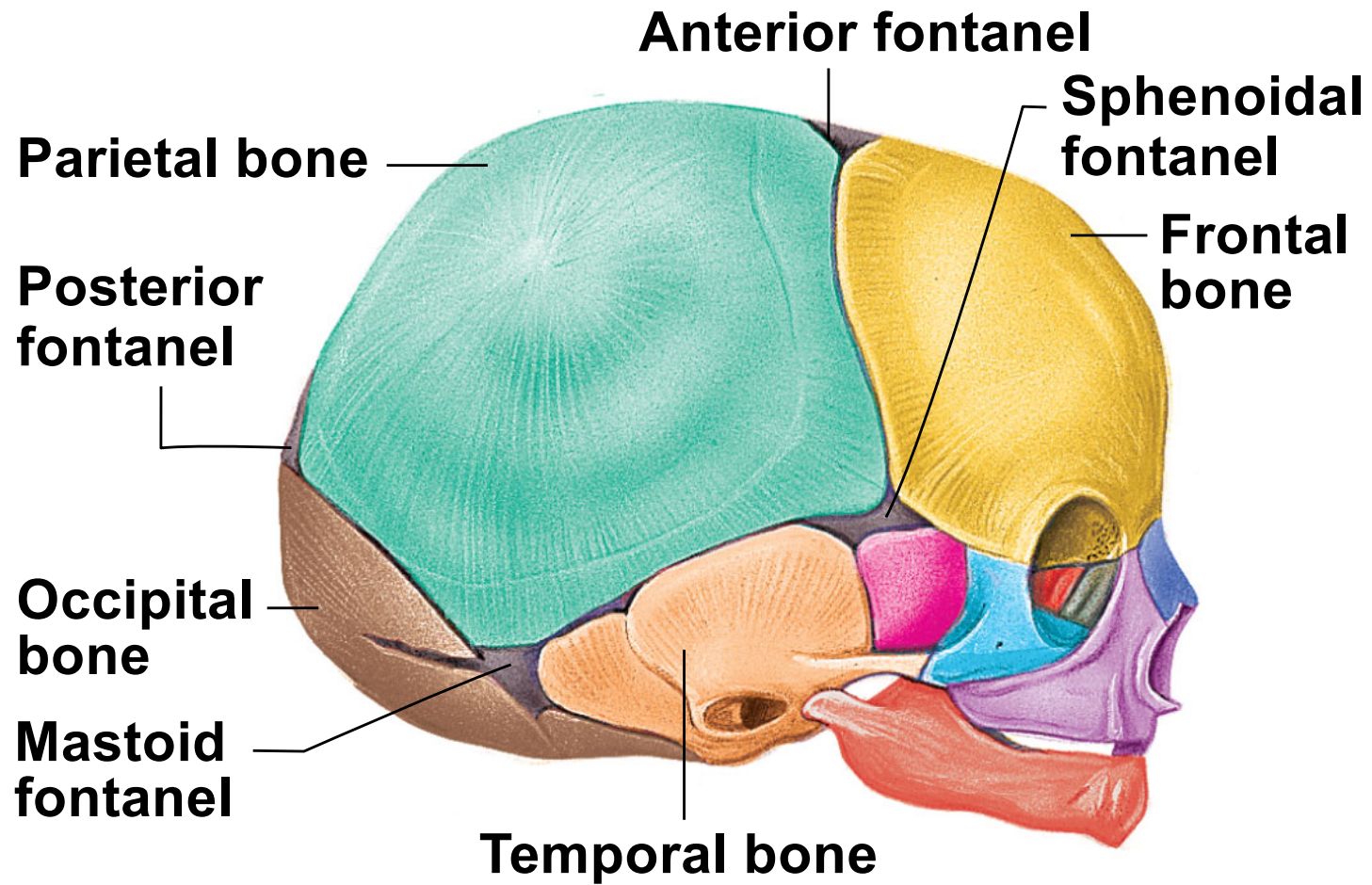


**(a) Anterior view**

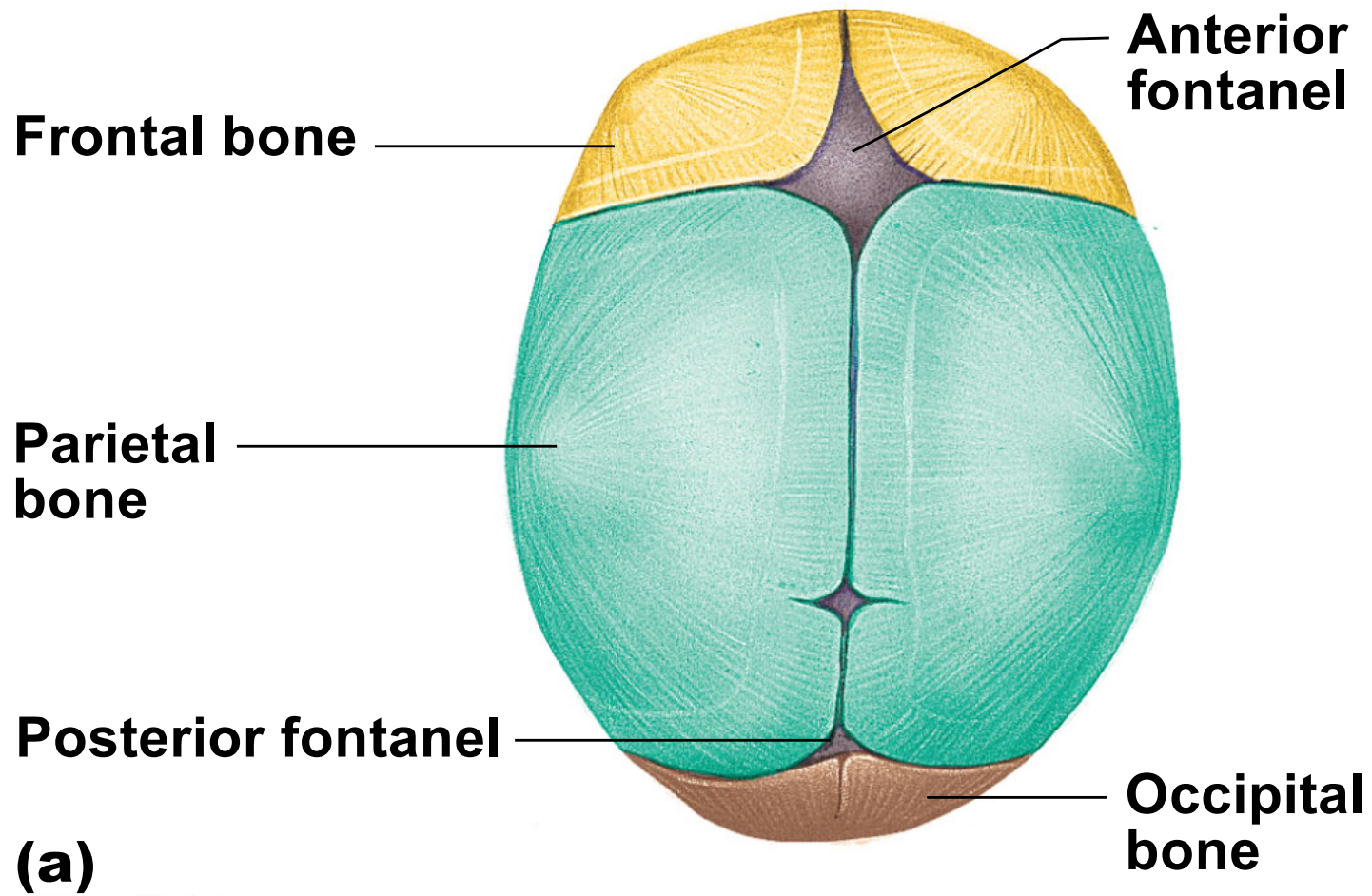


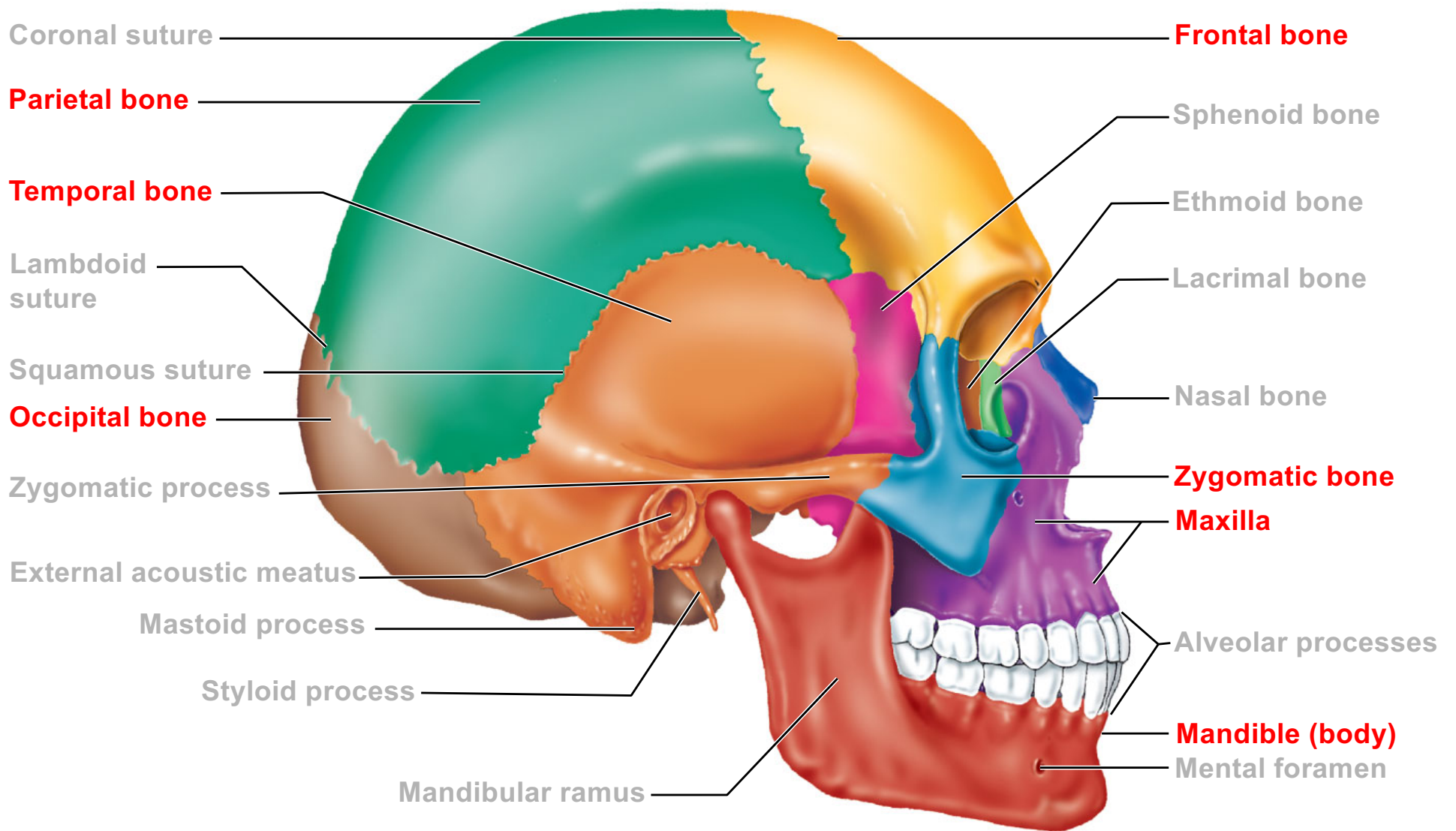
**(b) Posterior view**



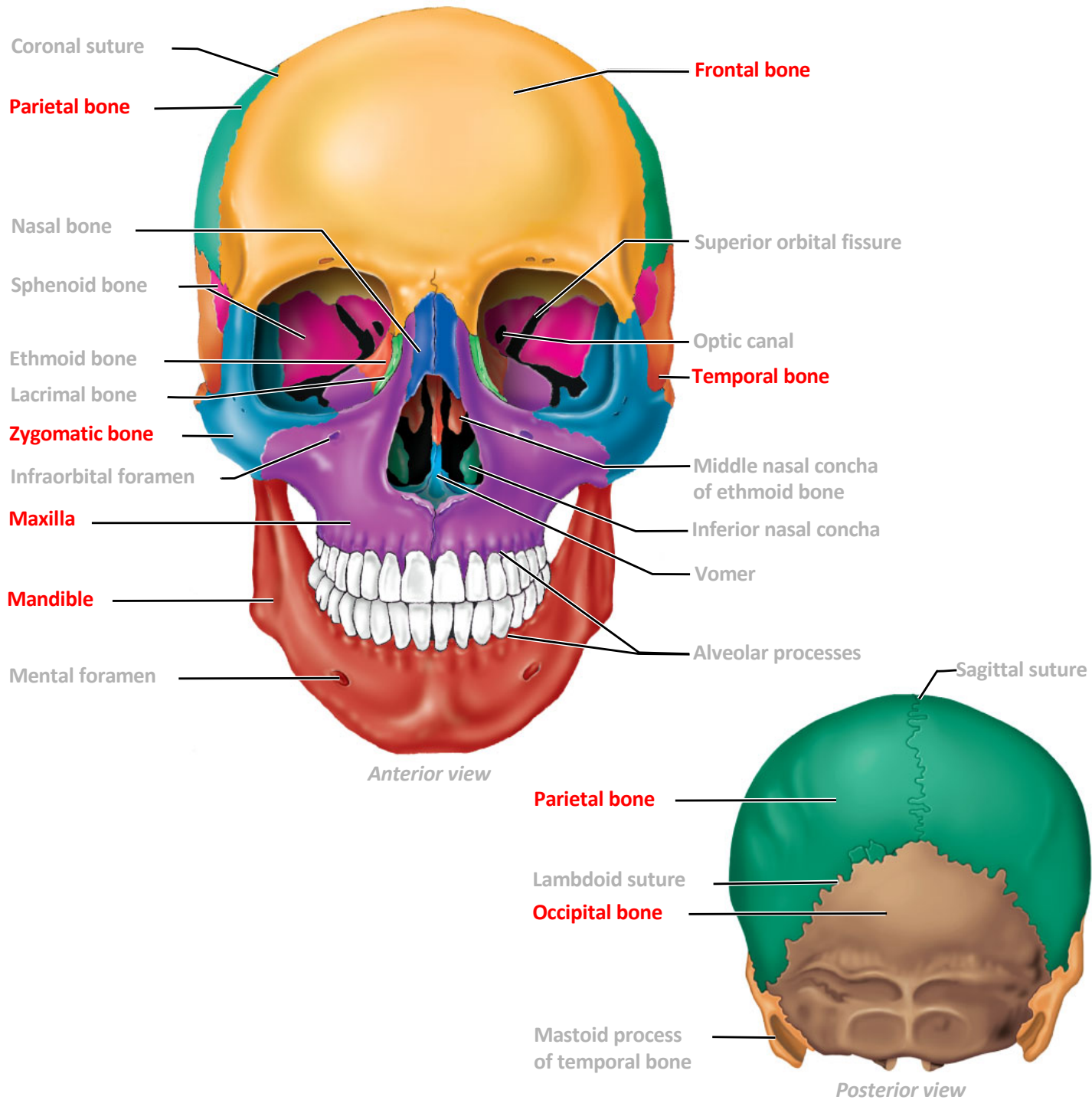


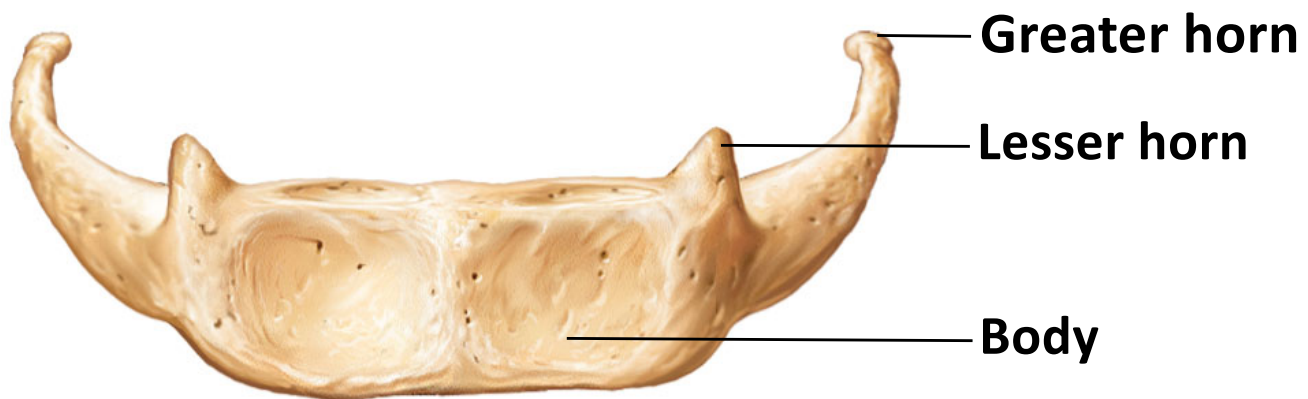
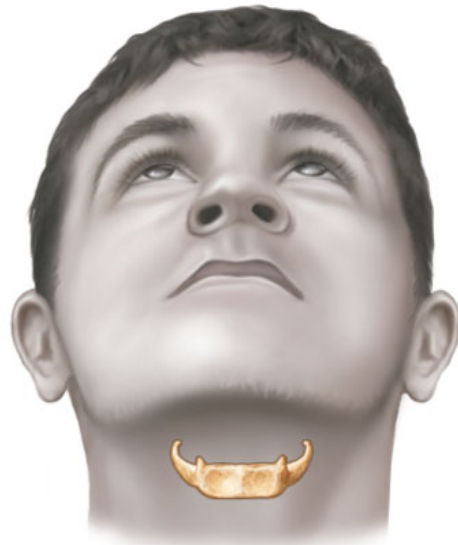
**(b)**

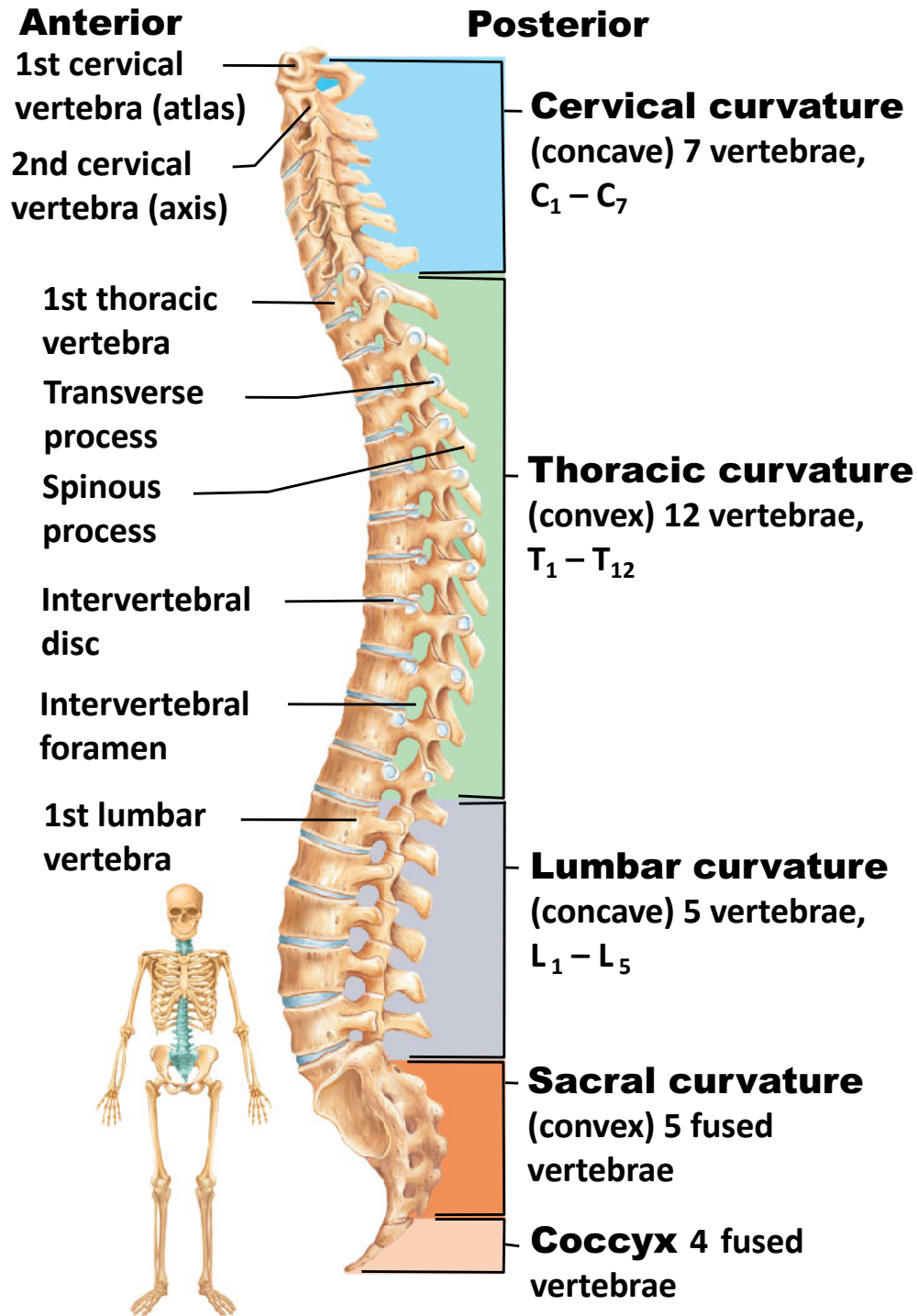


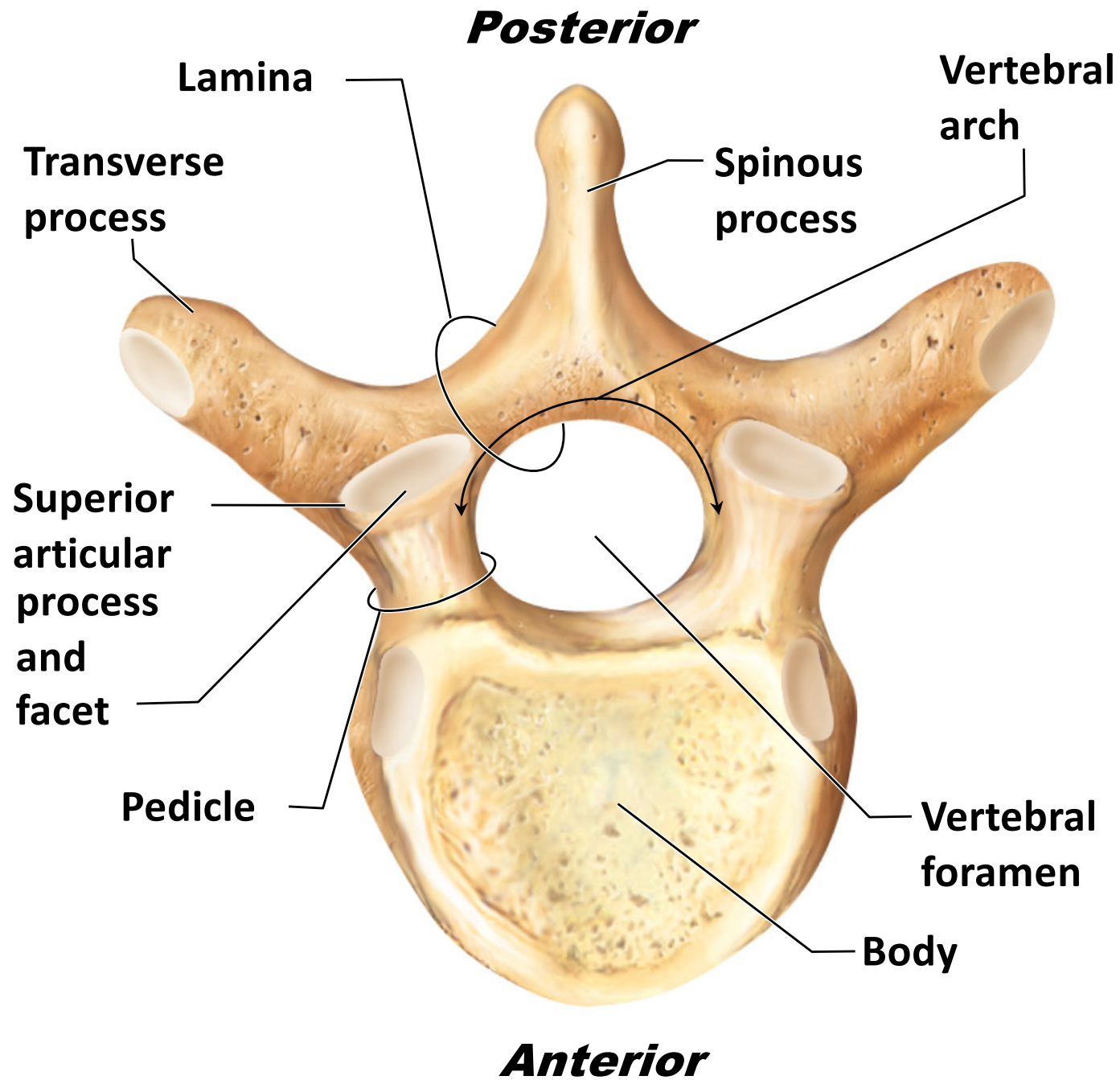




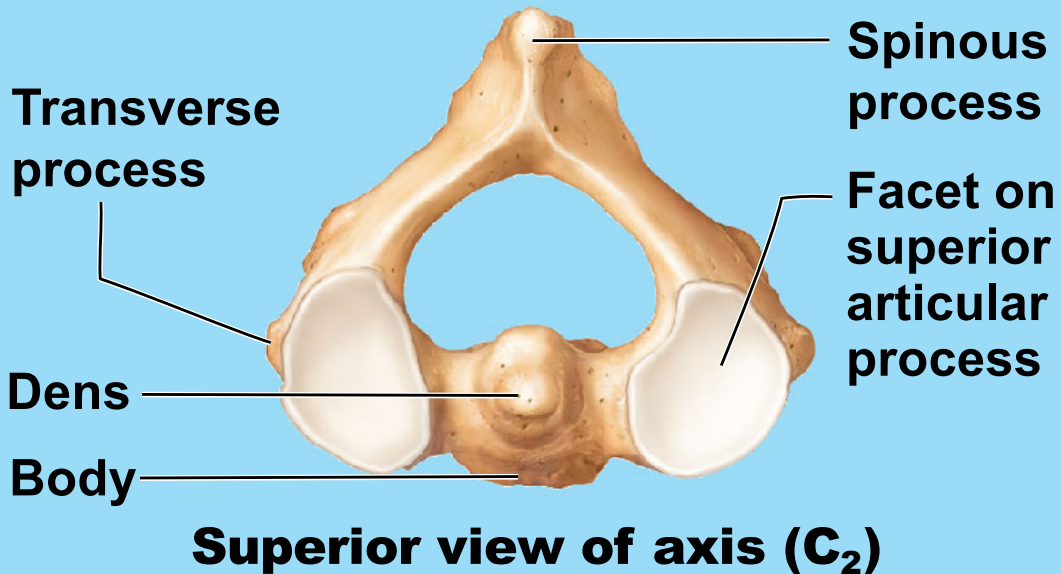
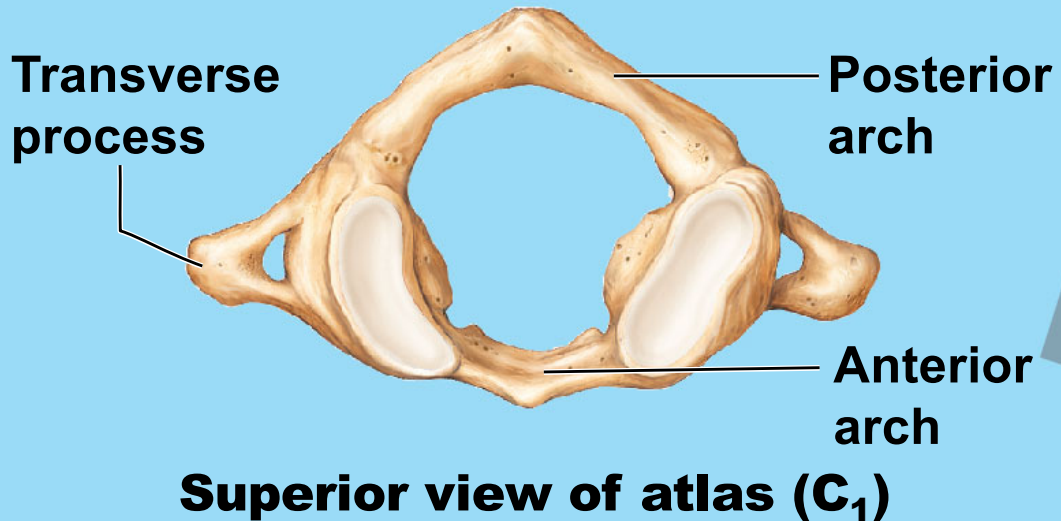






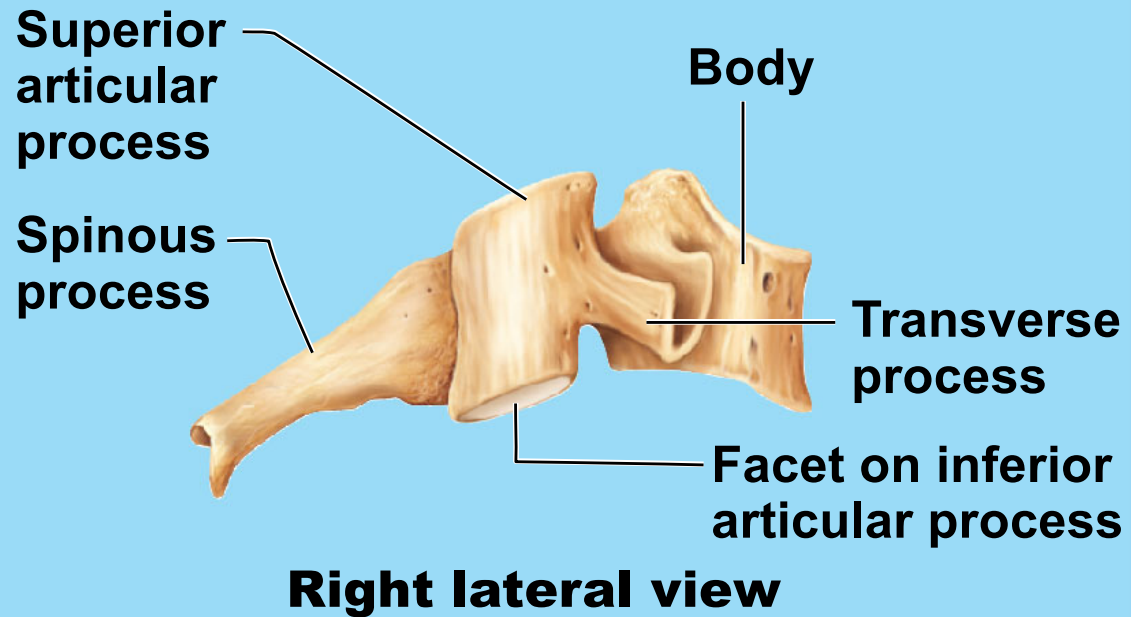
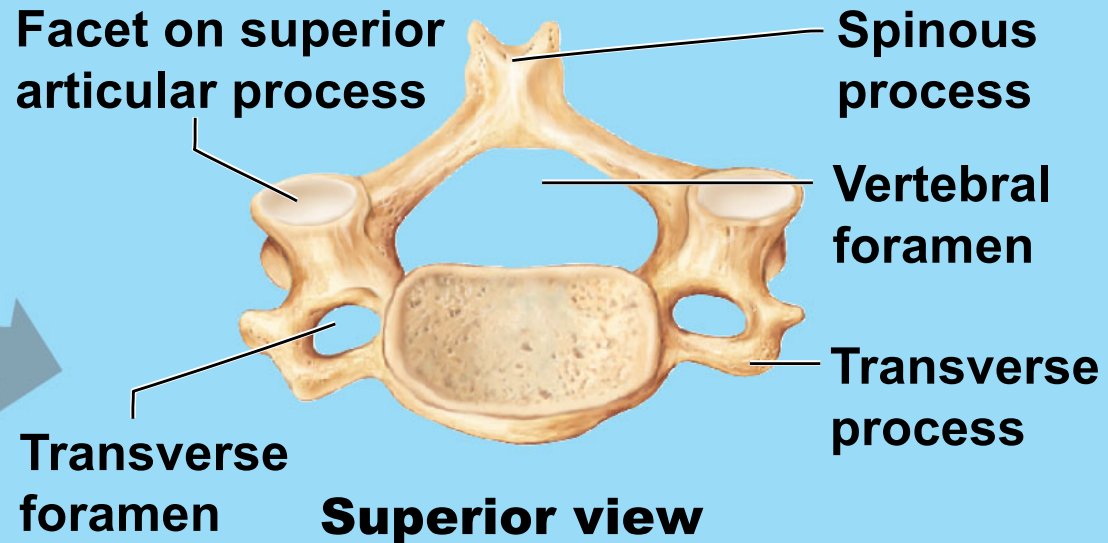


## (a) ATLAS AND AXIS





## (b) TYPICAL CERVICAL VERTEBRAE



### (c) THORACIC VERTEBRAE

Spinous process

Transverse process

Vertebral foramen

Facet for rib

Facet on superior articular process

Body

**Superior view**

Facet on superior articular process

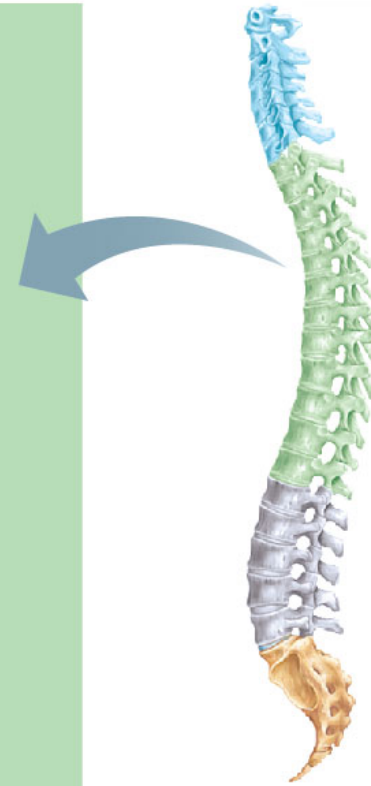
Body

Facet on transverse process

Spinous process

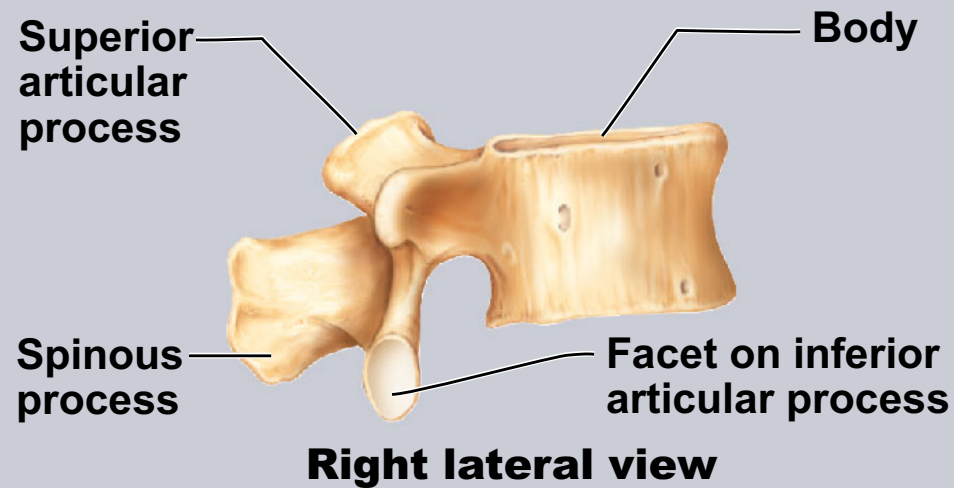
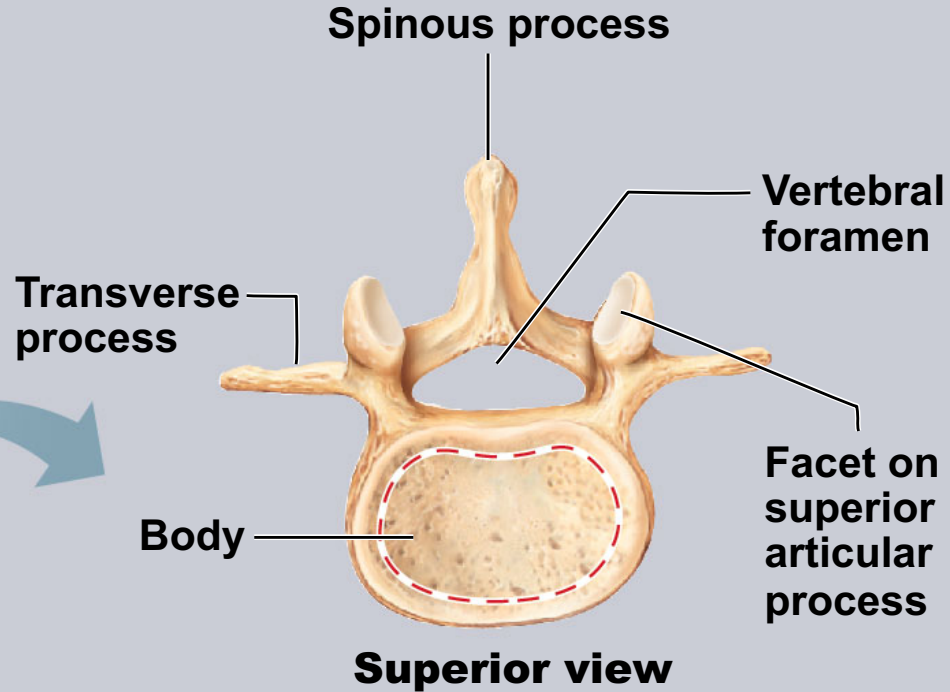
Costal facet for rib

**Right lateral view**

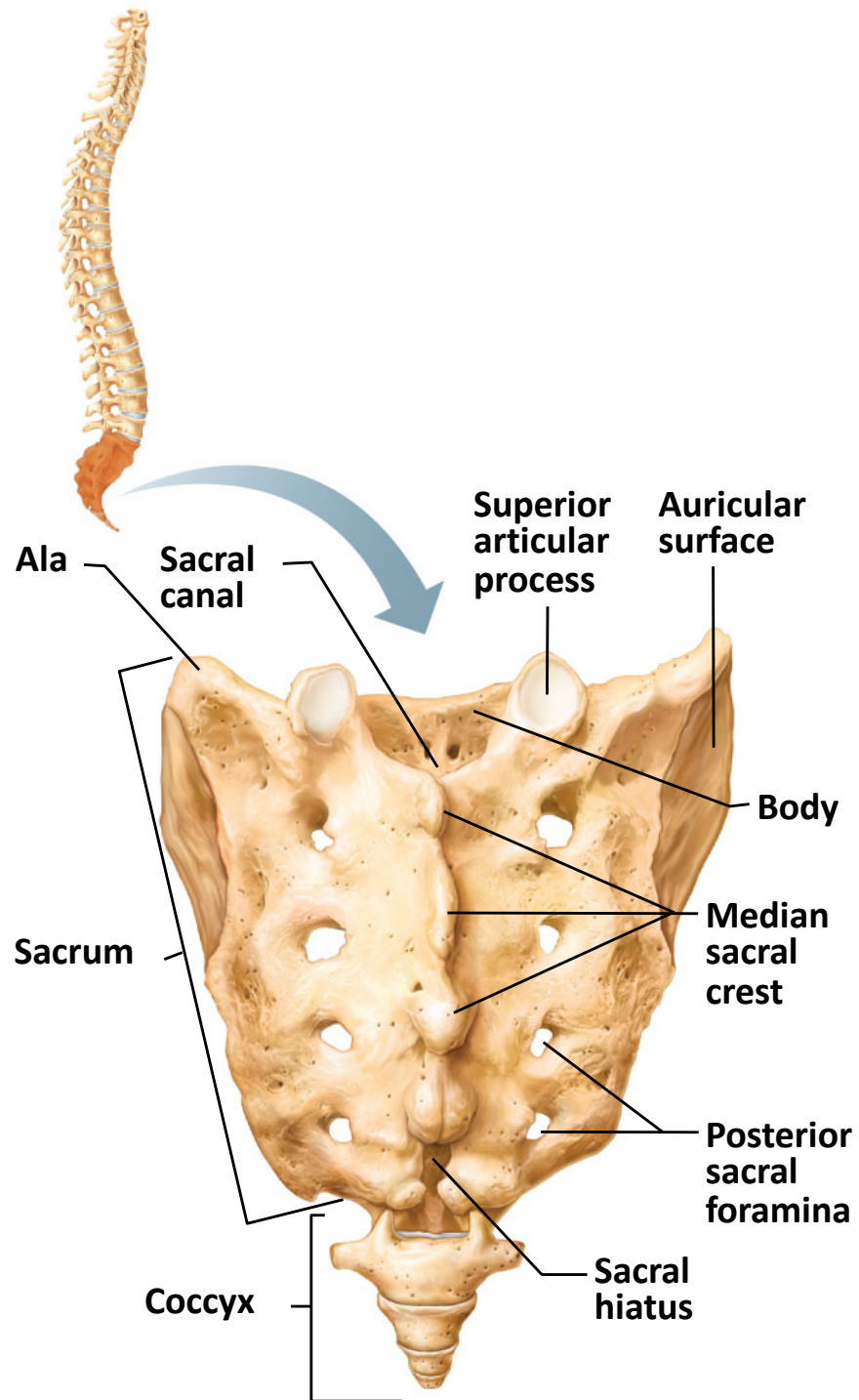


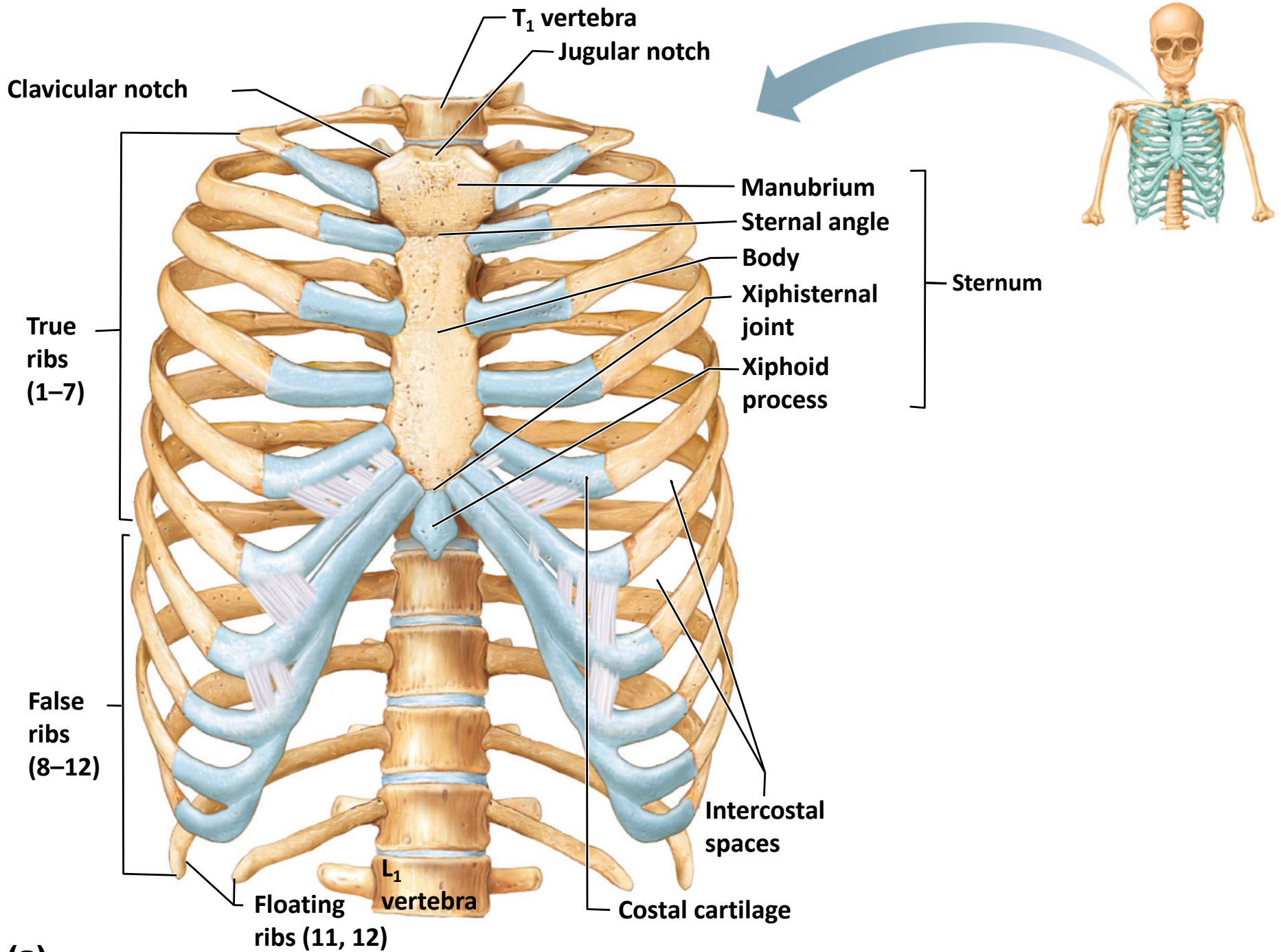


### (d) LUMBAR VERTEBRAE

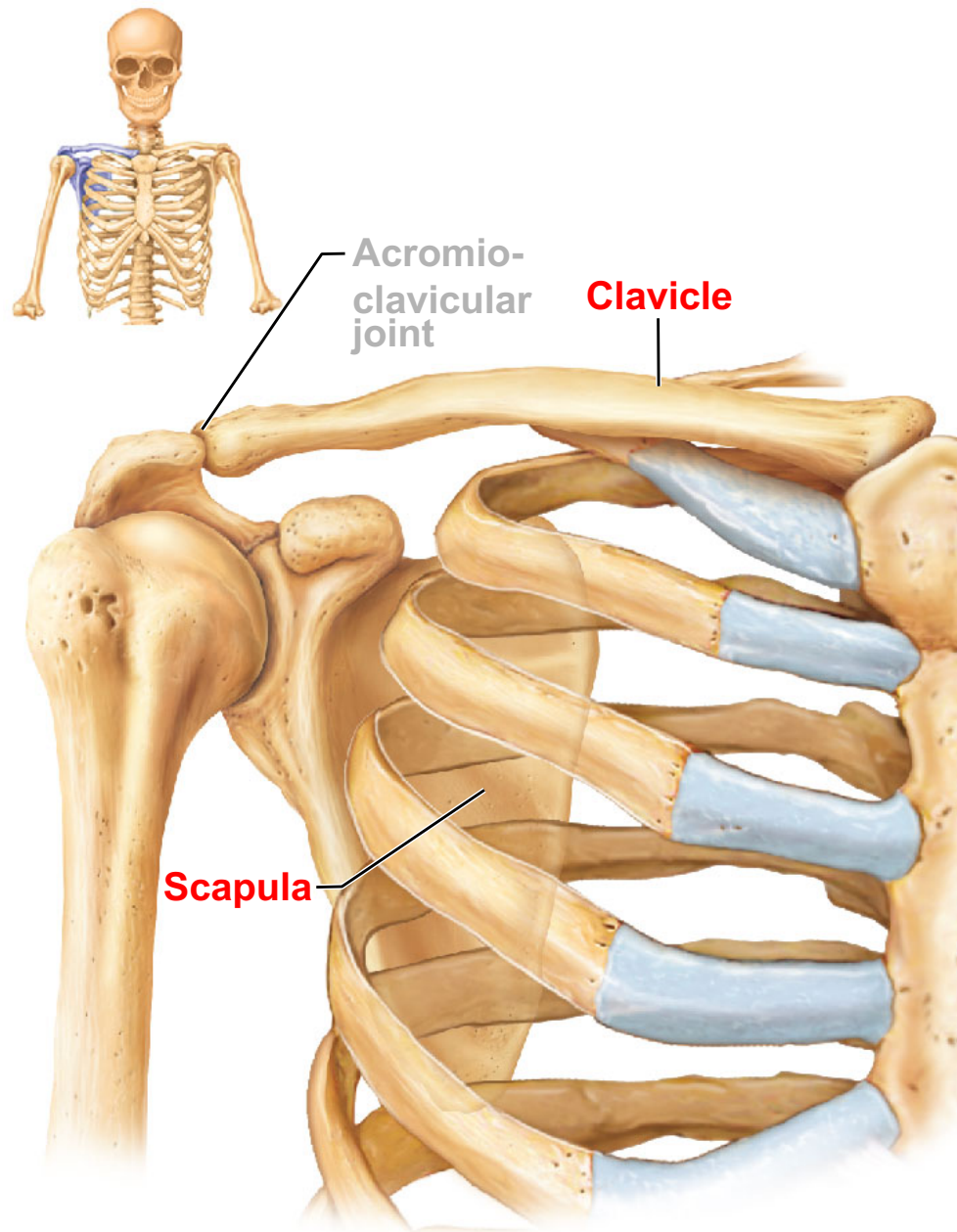




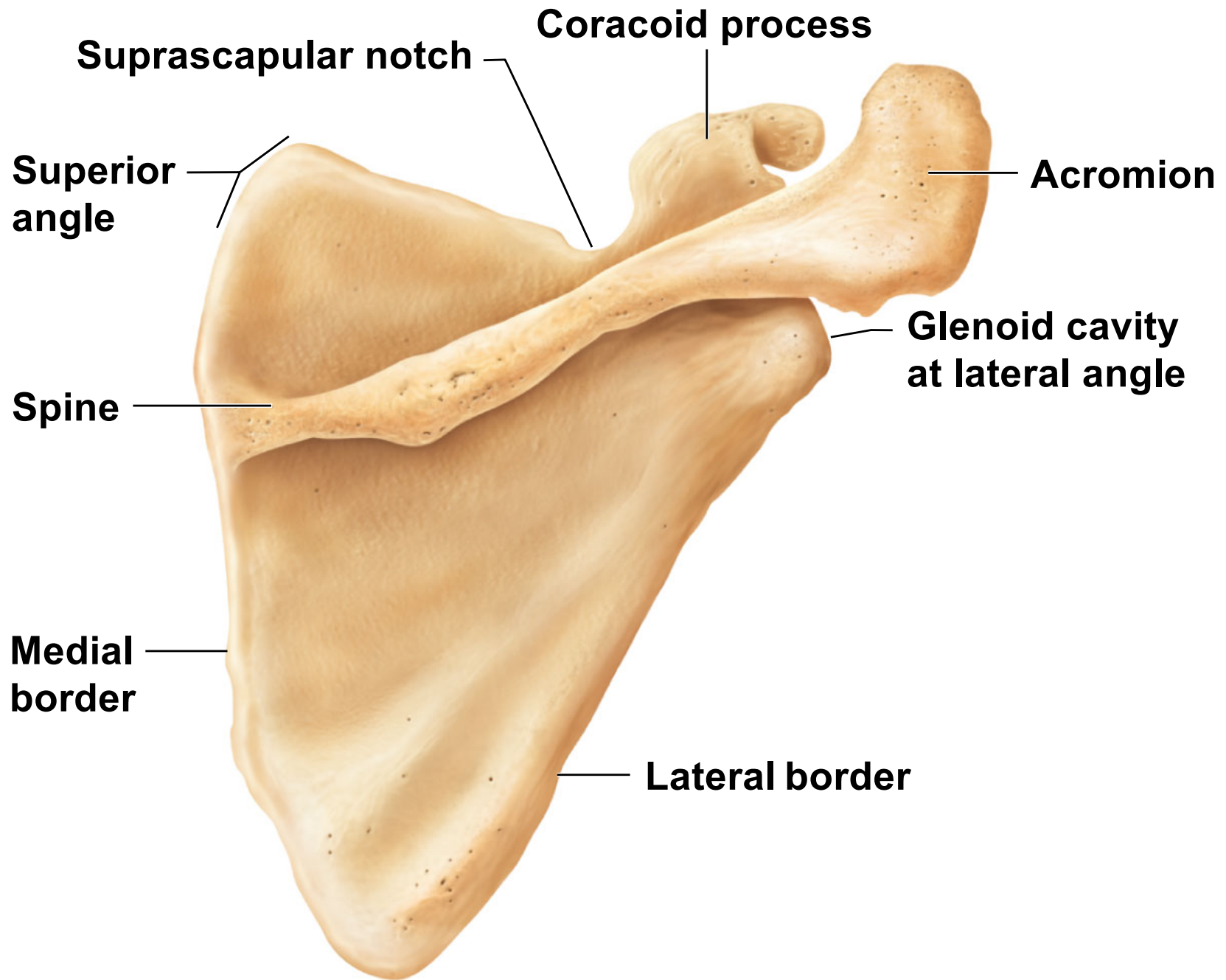




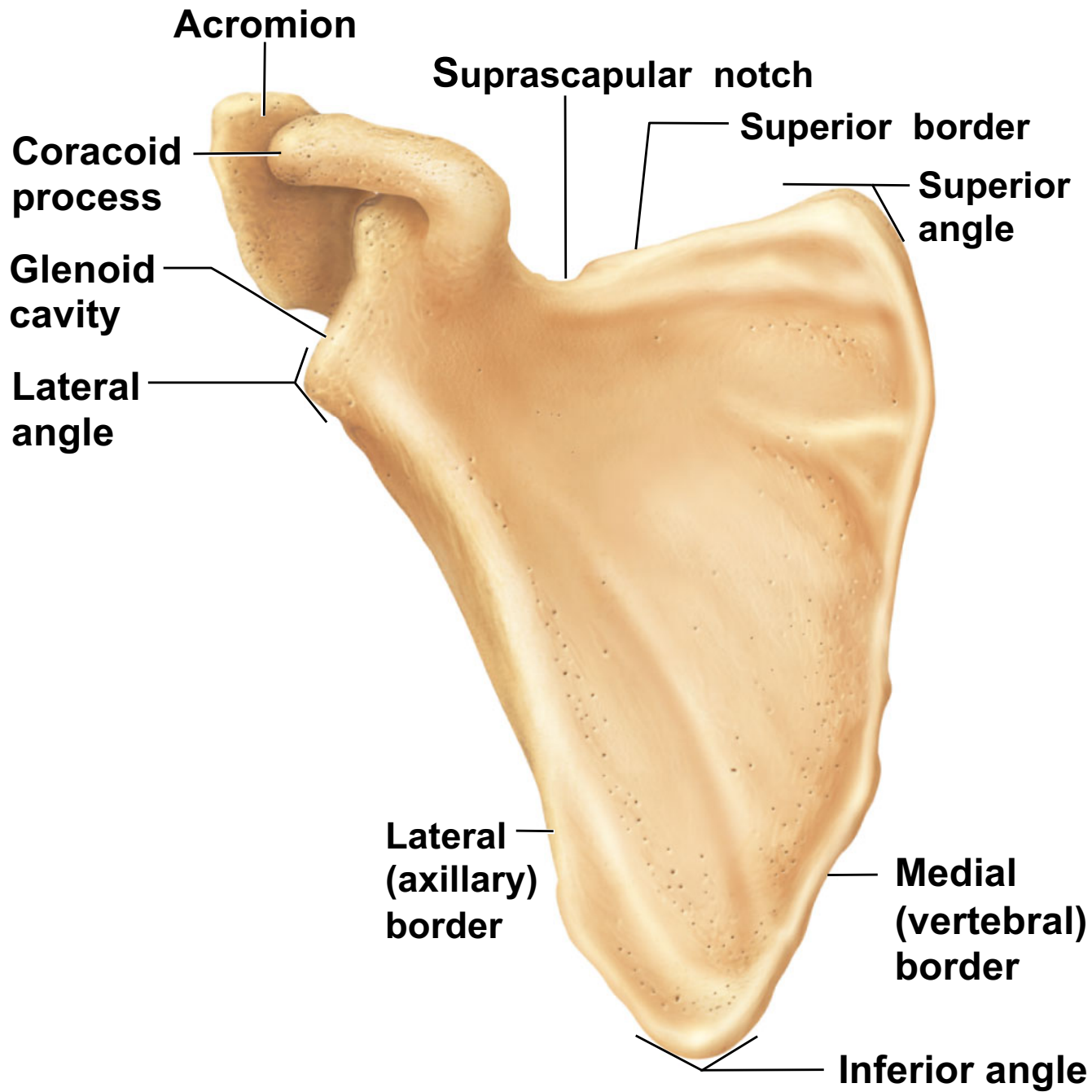
**(a)**



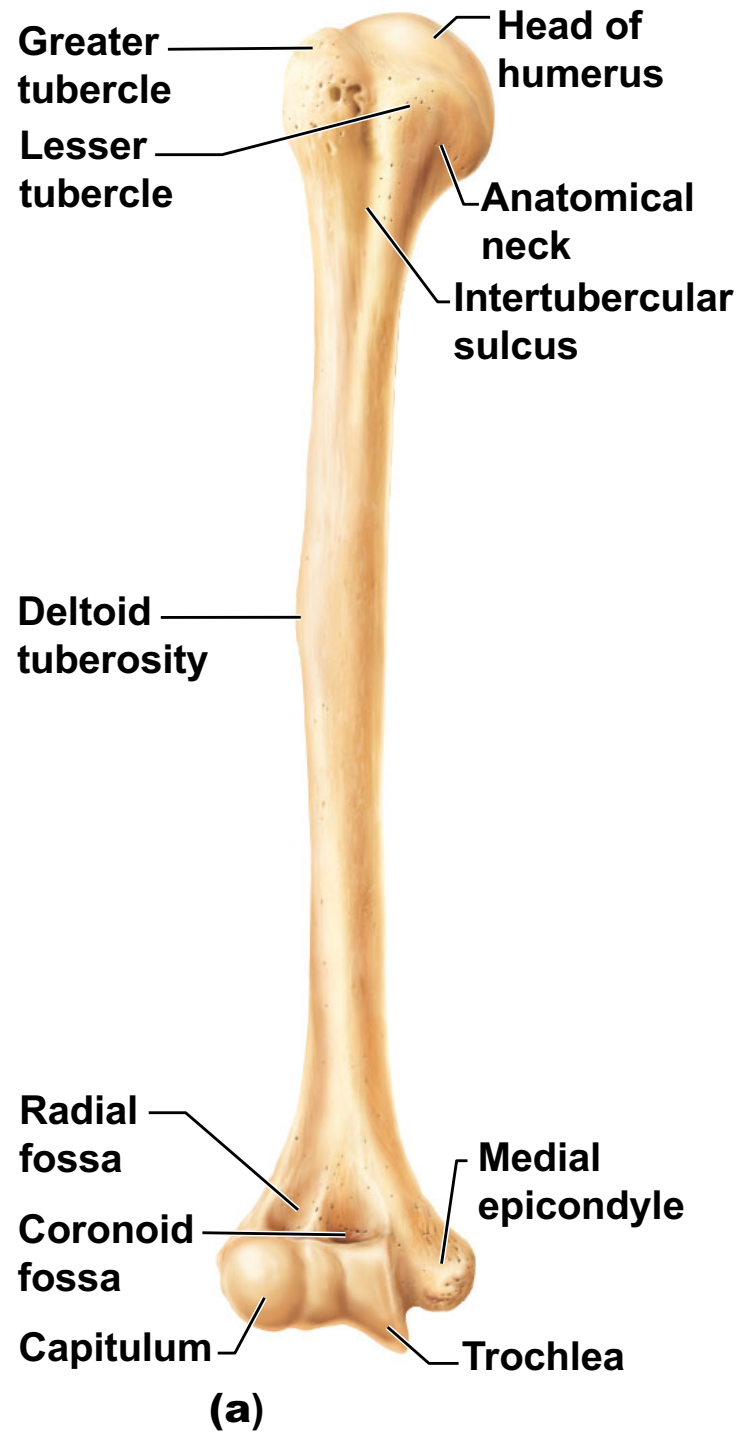
**(a) Articulated right shoulder (pectoral) girdle showing the relationship to bones of the thorax and sternum**

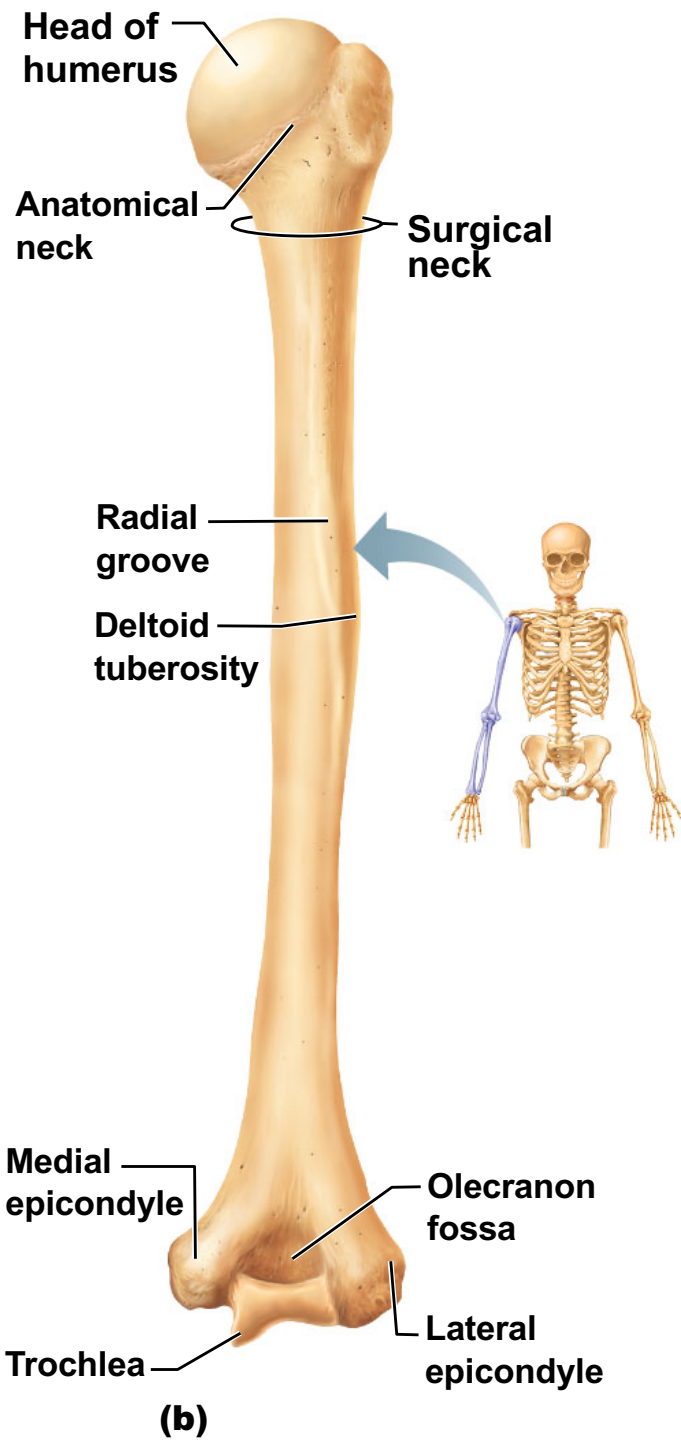


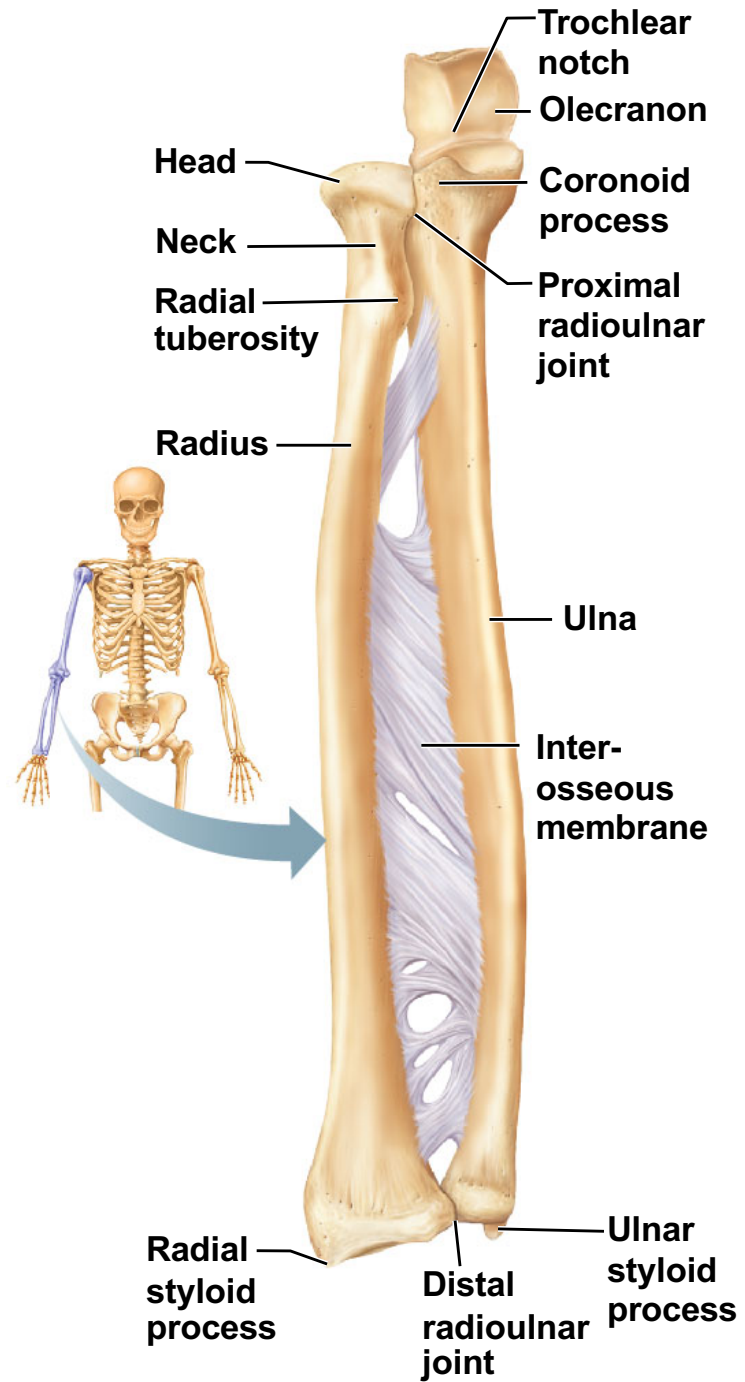
**(c) Right scapula, posterior aspect**



**(d) Right scapula, anterior aspect**

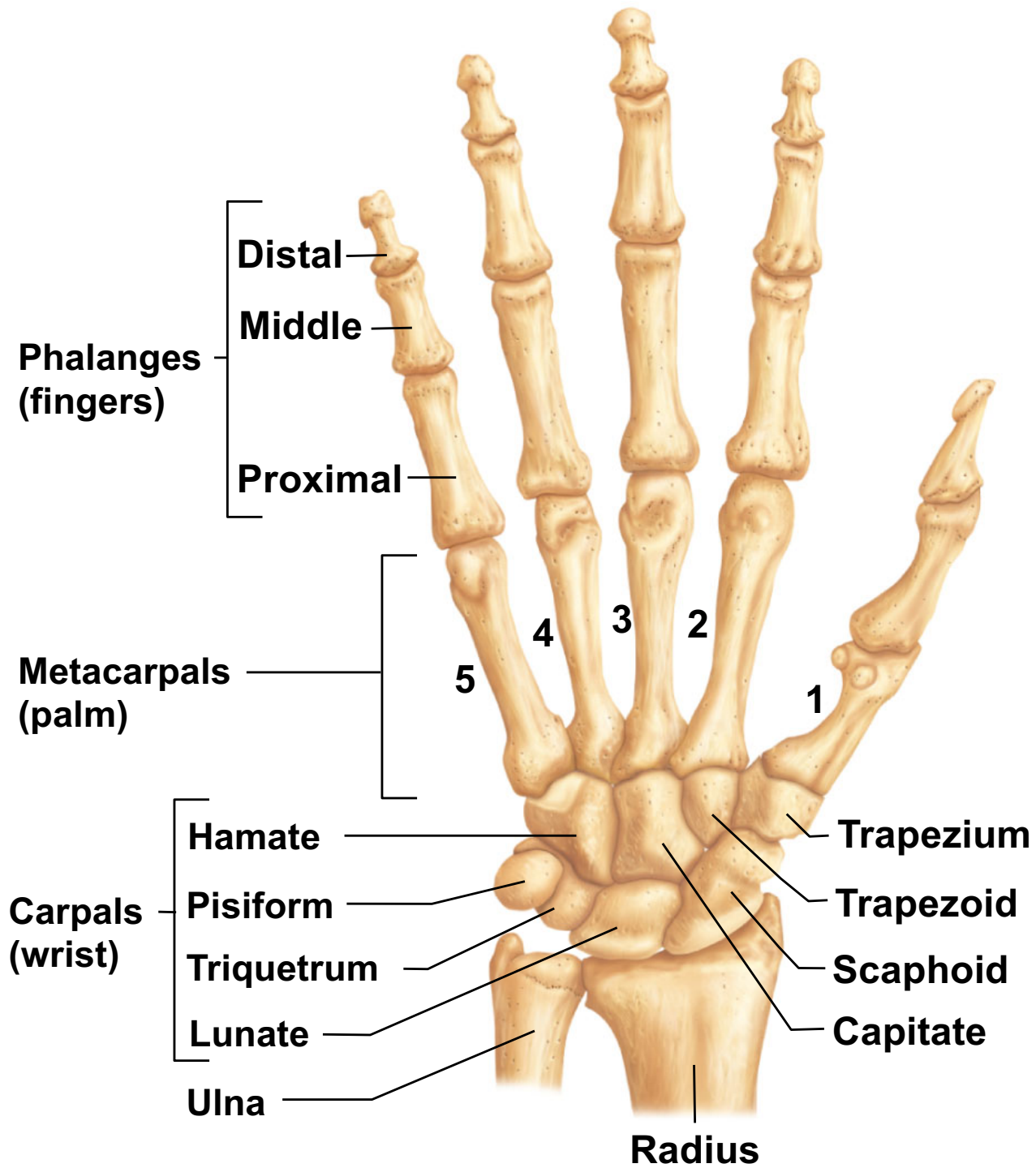






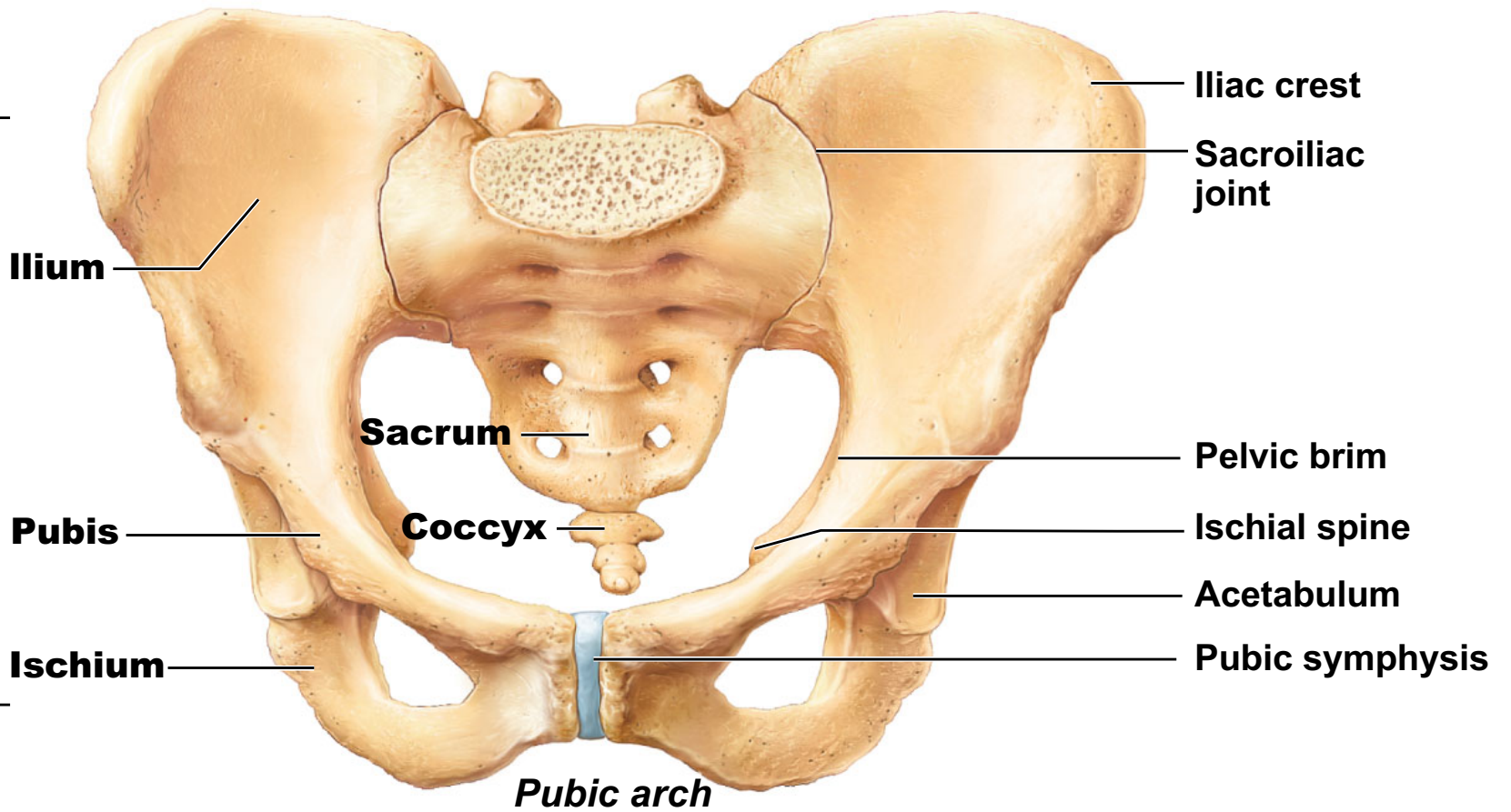
(c)



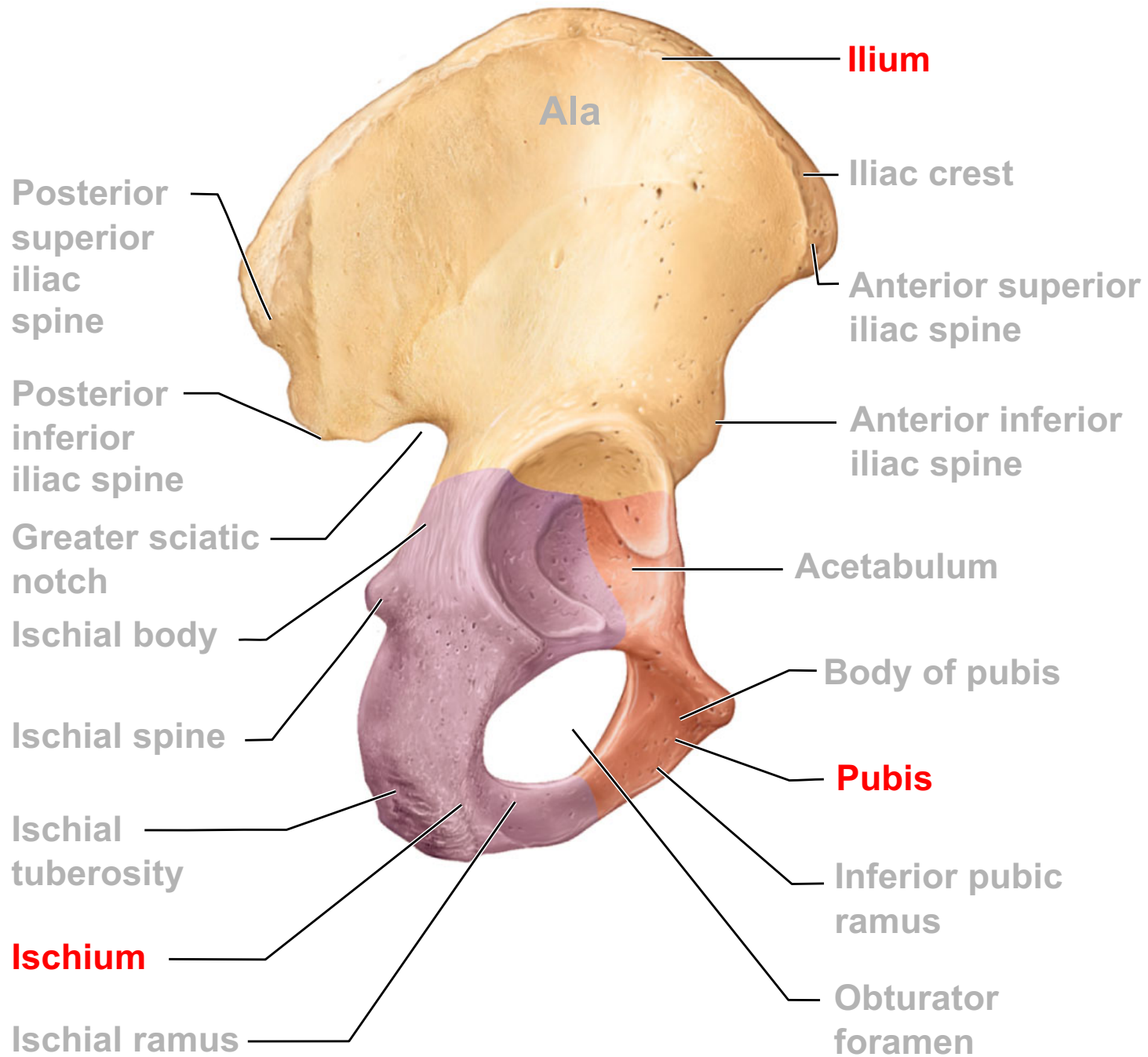




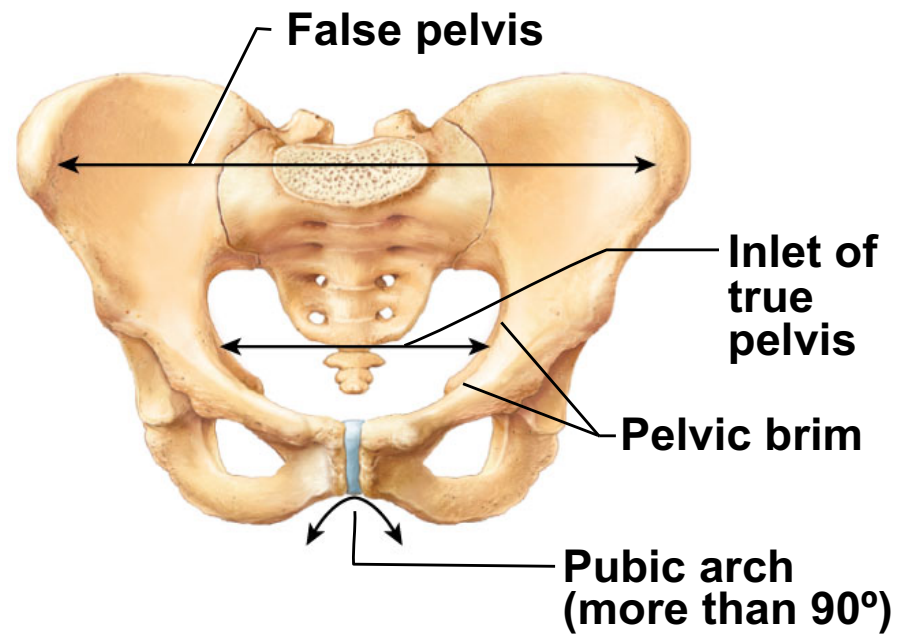
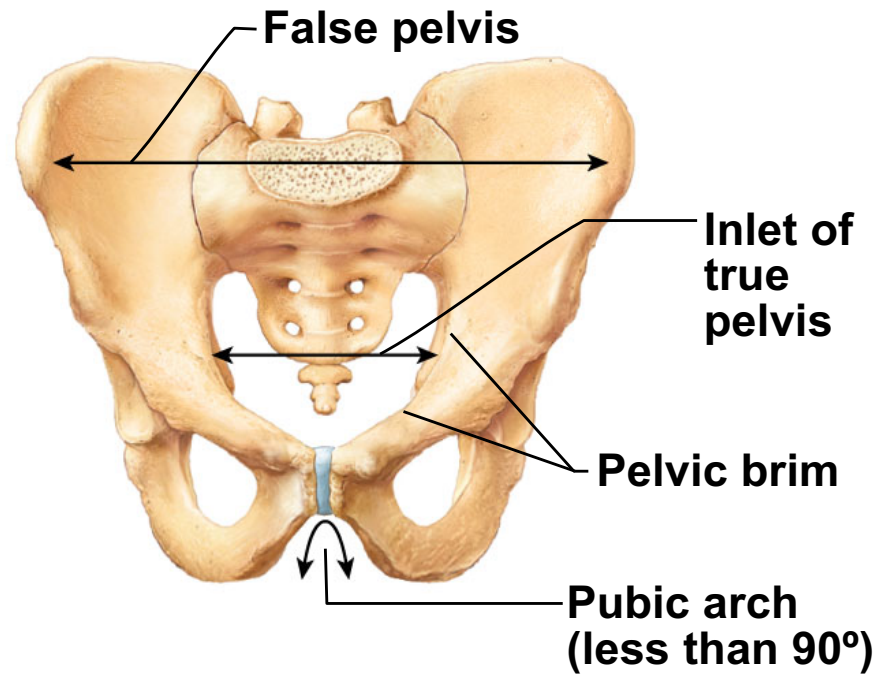
**Coxal bone**  
(or hip bone)



**(a)**

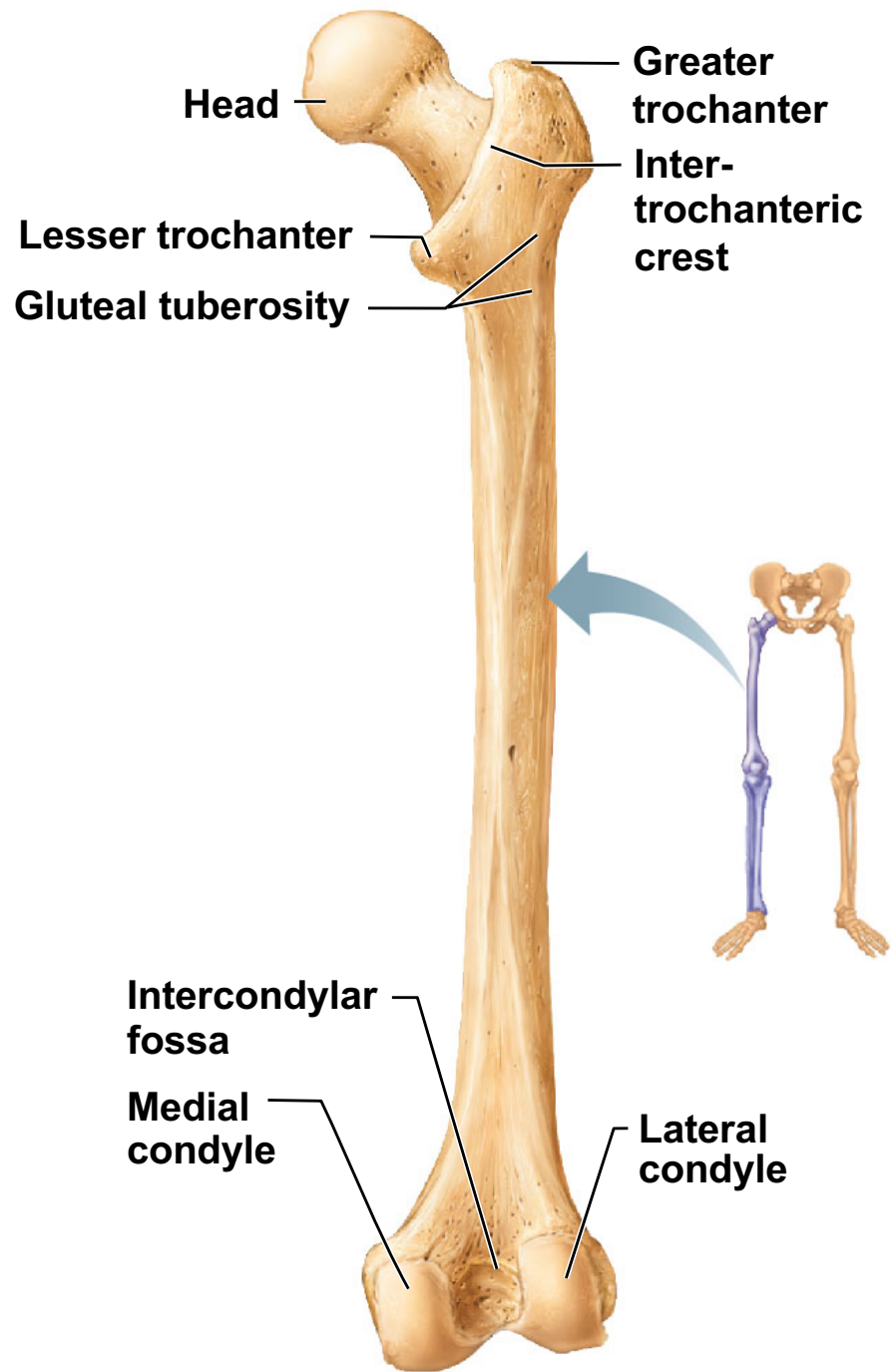


**(b)**



**(c)**





**(b)**

