

Ribs articulate with the vertebrae and extend into the body wall

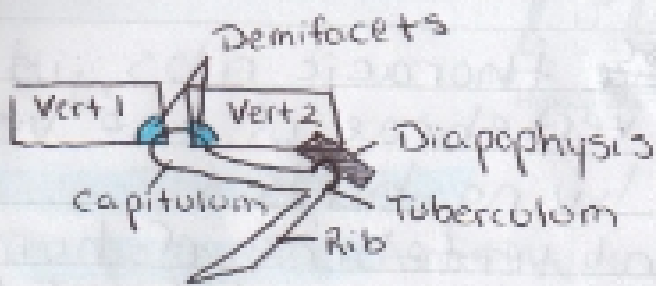
Fish

- Some teleost fish have two pairs of ribs per vertebrae; dorsal ribs separate by paxial muscles and epaxial muscles;
- ventral ribs used to hang muscles on and eventually grow down to meet and become the **nemal arch**

Tetrapods

- most are **bicipital**: two points of articulation with the vertebrae

- Dorsal head = **tuberculum**, articulates with **diapophysis**
- Ventral head = **capitulum**, articulates with **Parapophysis**



- In later tetrapods, the capitulum articulates with 2 vertebrae at sites called **demifacets**
- Example: Cat

- All Ribs have a **Costal segment** part that articulates with vert column and a **sternal segment**: part that curves around to articulate with sternum

Amphibians

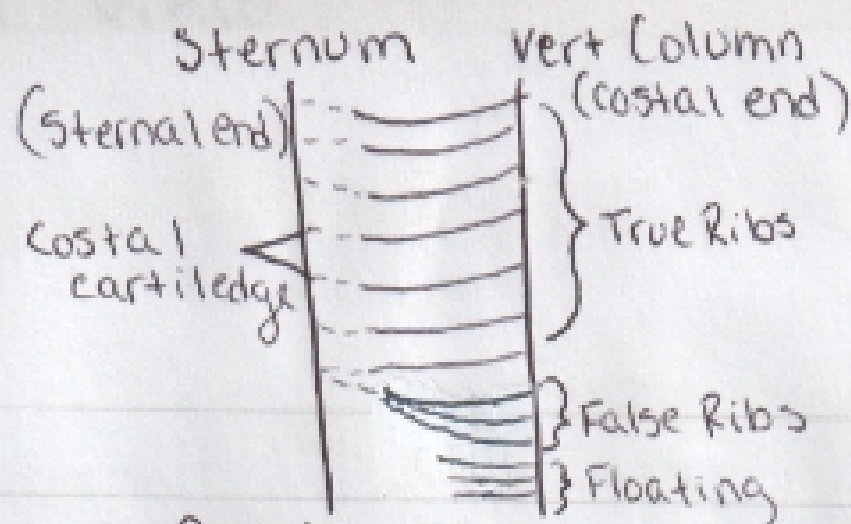
- most ribs are associated w/ vert column
- except extreme caudal
- most ribs short and stubby
- only anurans are not bicipital
- in turtles, they fused and become carapace

Reptiles

- Crocodylians lack ribs on atlas/axis; no ribs in lumbar region
- Lizards and Crocodylians have long ribs on many of the trunk vert. and short ribs in neck

Birds

- ribs confined to trunk in adults
- thin, broad ribs provide them w/ a lightweight but sturdy thoracic body wall skeleton & attachment of powerful muscles required for flight



Mammals

- most ribs confined to thorax; # ranges from 9 pairs to 24; 12 most common
- where # larger than 10, the rest are "floating" and fail to reach the sternum

Tetrapod Sternum

- predominantly amniotes

- chief base against pectoral girdle and ribs are braced

Turtles have no sternum

- Sterna of modern birds capable of flight have developed into enormous keel, or **carina**

- Humans have a manubrium

