

**Osteology of  
the Ribs and Sternum**

- I. Thoracic cage
  - A. Composed of the ribs, costal cartilages, sternum, and thoracic vertebrae
  - B. Functions in protection and support, assists with respiration
  
- II. Ribs: 12 pairs
  - A. True ribs vs. false ribs; floating ribs
    1. True ribs: ribs 1-7 (direct attachment to the sternum)
    2. False ribs: ribs 8-12 (no direct attachment to the sternum)
      - a. Floating ribs: ribs 11 and 12 (no attachment to the sternum)
  
  - B. Typical ribs: ribs 3-9
    1. Capitulum costae (aka, head)
      - a. Superior articular facet: articulating with the inferior costal demi-facet of a thoracic vertebra (thoracic vertebra # = [rib # - 1])
      - b. Inferior articular facet: articulating with the superior costal demi-facet of a thoracic vertebra (thoracic vertebra # = rib #)
      - c. Interarticular crest: bony ridge found between the superior and inferior articular facets; ligament attachment site
  
    2. Collum costae (aka, neck)
      - a. Crest: ridge on the superior surface
  
    3. Tubercle

- a. Articular facet: articulation with the transverse costal facet of the thoracic vertebra (thoracic vertebra # = rib #); positioned more inferiorly and proximally on the bone
  - b. Non-articular surface: site of ligamentous attachment between the rib and the transverse process of the thoracic vertebra; positioned more superiorly and distally on the bone
4. Corpus costae (aka, shaft or body)
- a. Costal angle
  - b. Costal groove: located on the inferior deep border of the rib
  - c. Costal cartilage surface: attachment site for the costal cartilage, on distal end of corpus

C. Atypical ribs: ribs 1, 2, 10, 11, 12

1. First rib
- a. Capitulum costae
    - i. Articular facet of the capitulum: for articulation with the superior costal facet of T1
  - b. Collum costae: no distinctive crest
  - c. Corpus costae
    - i. Groove for subclavian artery; proximal to the scalene tubercle
    - ii. Scalene tubercle: roughened elevation, on the inner border of the superior surface
    - iii. Groove for subclavian vein; distal to the scalene tubercle
    - iv. No costal angle
    - v. No costal groove

2. Second rib
  - a. Tuberosity for the serratus anterior muscle: roughened area, on the outer border of the superior surface of the corpus costae
  
3. Tenth rib
  - a. Capitulum costae is variable, with either one or two articular facets
  - b. Articular facet of tubercle may be missing
  
4. Eleventh rib
  - a. Capitulum costae: a single articular facet
  - b. Collum costae and tubercle are absent
  - c. Corpus costae: costal angle is present, but costal groove may be absent or very shallow; costal cartilage surface absent
  
5. Twelfth rib
  - a. Capitulum costae: a single articular facet
  - b. Collum costae and tubercle are absent
  - c. Corpus costae: no costal angle, no costal groove, no costal cartilage surface

### III. Sternum

#### A. Manubrium sterni (aka, presternum)

1. Jugular notch: concavity on the superior border of the manubrium
2. Clavicular notch: concave facet surface lateral to the jugular notch
3. Costal notches I and II
  - a. Costal notch I lies immediately inferior and lateral to the clavicular notch
  - b. Costal notch II lies at the inferior-lateral margin of the manubrium, where the manubrium joins with the gladiolus

- i. Sternal angle: the angle formed by the anterior surfaces at the junction of the manubrium sterni and the gladiolus
- B. Gladiolus (aka, corpus sterni or body)
- 1. Sternebrae 1-4: individual segments, typically fused together
  - 2. Transverse lines: line between the individual sternebrae
  - 3. Costal notches II-VII: found on the lateral margin of sternebrae 1-4
    - a. Costal notch II lies at the superior-lateral margin of the gladiolus, where the gladiolus joins with the manubrium
    - b. Costal notch VII lies at the inferior-lateral margin of the gladiolus, where the gladiolus joins with the xiphoid process
- C. Xiphoid process (aka, ensiform process or metasternum): most inferior segment of the sternum