

Five sections of the vertebral column are readily identified:

1. **Cervical** — These 7 bones are in the neck region. The topmost two are the *atlas* and the *axis*. They permit free movement and rotation of the head. Virtually all mammals, even tall giraffes, have 7 cervical vertebrae.
2. **Thoracic** — They number 12 in man, 14-15 in the pig. They have prominent dorsal spines and *articular costal* facets for the attachment of ribs.
3. **Lumbar** — These number 5 in man and 6-7 in the pig. These are characterized by massive centra, reduced dorsal spines, and long transverse processes.
4. **Sacral** — In man 5 sacral vertebrae are fused into one bone, the *sacrum*. The pig has only 4.
5. **Caudal** — There are 20-23 caudal vertebrae in the pig extending out into the tail. In man 3-5 bones are fused to form the *coccyx*.

Variations in the number of vertebrae:

Region	Pig	Cat	Man
Cervical	7	7	7
Thoracic	14-15	13	12
Lumbar	6-7	7	5
Sacral	4	3	5
Caudal	20-23	21-25	3-5 (Coccyx)

Ribs — In man there are 12 pairs of ribs. Of these, the upper 7 pairs are known as “*true*” ribs. They articulate with the thoracic vertebrae as well as with the *Sternum*, or breastbone. The attachment to the sternum is by way of *costal cartilage*, not bone. The next 3 are called “*false*” ribs. They do not articulate with the sternum directly only by way of the seventh rib. The last two pairs of ribs are called “*floating*” ribs. They articulate with the thoracic vertebrae, but do not reach the sternum at all.

In the pig there are 14-15 pairs. Seven pairs articulate directly with the sternum by way of a short costal cartilage. The other ribs are joined together by their costal cartilage before attaching to the sternum.

Sternum — The sternum of pig and man are very similar. It consists of the anterior portion, the *manubrium*; a central portion, the *gladiolus*; and a posterior portion made of cartilage, the *xiphoid process*.

The *hyoid* bone, at the top of the trachea, and the 3 pairs of *auditory ossicles* in the middle ear: the *hammer*, *anvil*, and *stirrup*, are generally considered part of the axial skeleton, although embryologically they have quite different origins and are traced to the gill apparatus, jaw, and pharynx of fish.

Appendicular Skeleton

The appendicular skeleton consists of the *pectoral girdle* and the attached *forelimbs*, and the *pelvic girdle* and the attached *hind limbs*.

Pectoral Girdle — In man there are two pairs of bones which comprise this structure, the two *scapulas* and two *clavicles*. The pig does not possess clavicles. Much of the pig’s scapula remains cartilaginous even in the adult.

Forelimbs — In man each forelimb is composed of the *humerus* (upper arm), *ulna* and *radius* (lower arm), 8 *carpal* bones (wrist), 5 *metacarpals* (palm), and 5 *digits* composed of 14 *phalanges*.

In the pig the humerus, ulna and radius are reduced. There are 8 carpal bones, 4 metacarpals, and 4 digits each composed of 3 phalanges.

Pelvic Girdle — The pelvic girdle of the pig, as of man, consists primarily of a paired bone, the *innominate*, or *os coxa*. It is, in turn, formed from three separate bones which fused during fetal development. They are, the *ilium* laterally, the *ischium* posteriorly, and the *pubis* ventrally. A pad of cartilage, the *pubic symphysis*, lies at the mid-ventral juncture of the pubic bones and unites them ventrally. A spherical depression, the *acetabulum*, along the ventro-lateral border of the girdle, serves as the point of articulation for the hind limb. It is the “socket” that receives the ball-shaped head of the femur.