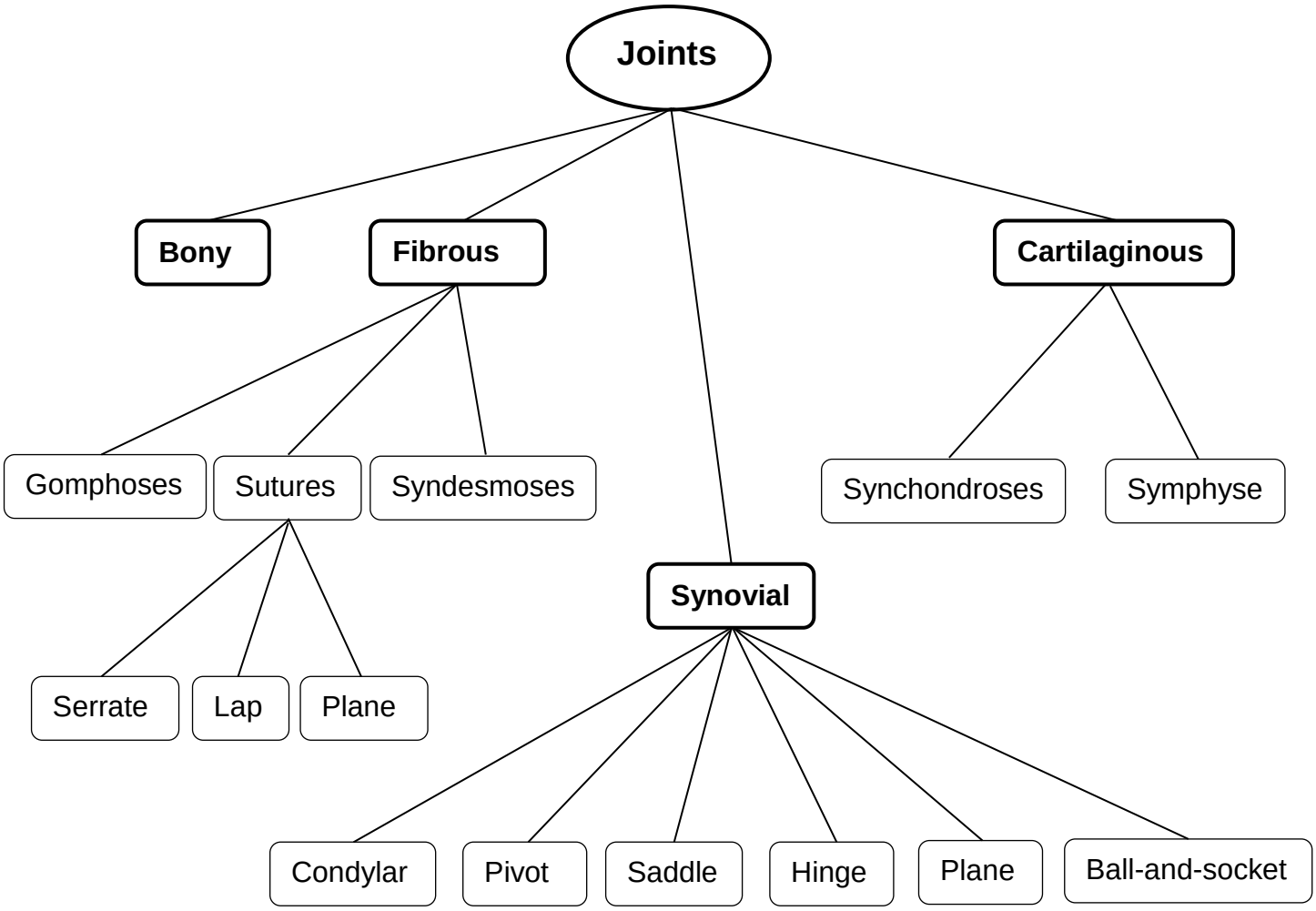
Joints

Joints are classified according to the way in which the adjacent bones are bound to one another other. The binding of adjacent bones can result in several forms of both free and immobile movements. Joints are often classified into four major categories: *bony, fibrous, cartilaginous, and synovial joints*.



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Characteristics and examples of joints* and their subclasses:

Joint	Special Characteristics	Example(s)
** Bony (synostosis)*	An immobile joint formed from the ossification of the gap between two bones. These result from the ossification of fibrous or cartilaginous joints to become a single bone.	The epiphysis and diaphysis of long bones in childhood and adolescence become bony joints in early adulthood.
**Fibrous (synarthrosis)*	The point at which adjacent bones are bound from the crossing over and penetration of collagen fibers into one another.	See examples below.
• Gomphoses	Little or no movement of bones due to very short collagen fibers. Allow for minor movements under stress.	Attachment of a tooth to its socket held together by the periodontal ligament.
• Syndesmoses	Attached bones which are more movable because of longer collagen fibers.	Shafts of radius and ulna, allowing for pronation and supination of forearm.
• Sutures	Little or no movement of bones due to very short collagen fibers. Only bind the bones of the skull together.	Bones of skull.
○ Serrate suture	Appear as wavy lines where adjoining bones interlock firmly with one another by their margins (like a jigsaw puzzle).	Coronal, sagittal and lambdoid sutures bordering the parietal bones.
○ Lap (squamous) suture	Occur where two bones have overlapping edges.	Between the temporal and parietal bones.
○ Plane (butt) suture	Occur where two bones have straight non-overlapping edges. The two bones border on one another.	Palatine processes of the maxillae in the roof of the mouth.
**Cartilaginous (amphiarthrosis)*	A joint where two bones are linked by cartilage.	
• Synchondroses	Occur where joints are bound by hyaline cartilage	The temporary joint between the epiphysis and diaphysis of long bones in children.
• Symphyses	Occur where two bones are	Pubic symphysis

	joined by fibrocartilage	
*Synovial (diarthrosis)	Is the most complex type of joints and includes some of the most freely movable type. The facing surfaces of two bones are covered in articular cartilage and contain synovial fluid within the join cavity.	Elbow, knee, wrist, ankle, knuckle, etc.
• Ball-and-socket	Where one bone has a smooth hemispherical head that fits into a cuplike socket on the other. Are multiaxial	Shoulder and hip joints.
• Condylar (ellipsoid)	Exhibit an extruding oval surface on one bone that fits nicely into a complementary-shaped depression on the other bone. Are biaxial.	Radiocarpal joint of the wrist and meta-carpophalangeal.
• Saddle	Both bones have a saddle-shape surface, where it is concave in one direction and convex in the other. Are biaxial.	Trapeziometacarpal joint between the trapezium of the wrist and metacarpal I at the base of the thumb.
• Plane (gliding)	Adjacent bones are flat or slightly curved and slide over each other allowing only limited movement. Are biaxial.	Found between the carpal bones of the wrist, tarsal bones of the ankle
• Hinge	Monoaxial joints moving freely in only one plane with little movement in any other plane (like a door hinge). Has one convex surface that fits into a concave depression on the other bone.	Elbow, knee, and interphalangeal joints (finger and toes).
• Pivot	Monoaxial joints where a bone spins on its longitudinal axis.	Radioulnar joint at the elbow, and the atlantoaxial joint between the first two vertebrae.