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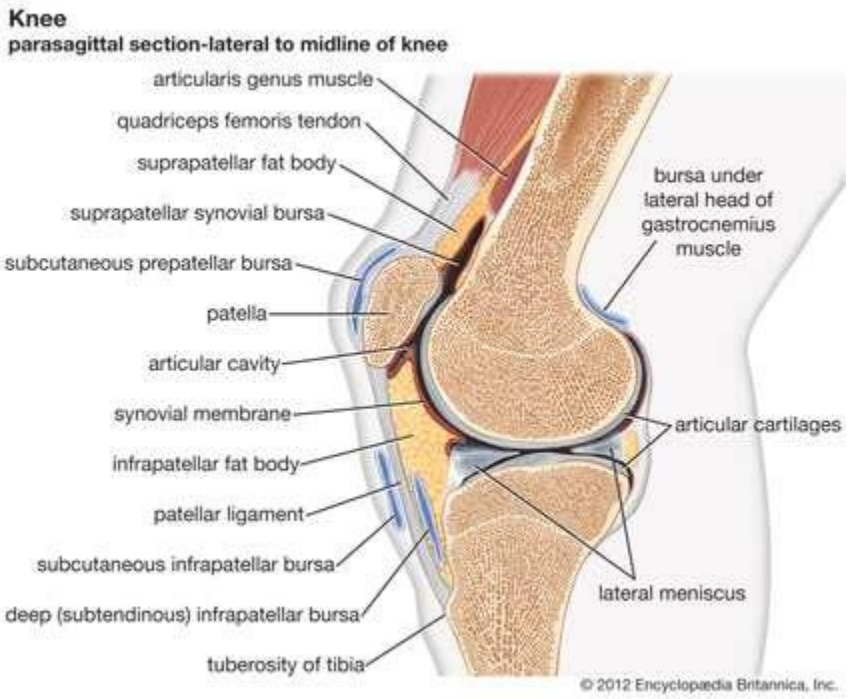
Upper limbs joints

JOINTS..

Joint, in anatomy, a structure that separates two or more adjacent elements of the skeletal system. Depending on the type of joint, such separated elements may or may not move on one another. This article discusses the joints of the human body—particularly their structure but also their ligaments, nerve and blood supply, and nutrition. Although the discussion focuses on human joints, its content is applicable to joints of vertebrates in general and mammals in particular. For information about the disorders and injuries that commonly affect human joints, *see* joint disease.



knee joint

The ligaments and cartilage in a knee joint.

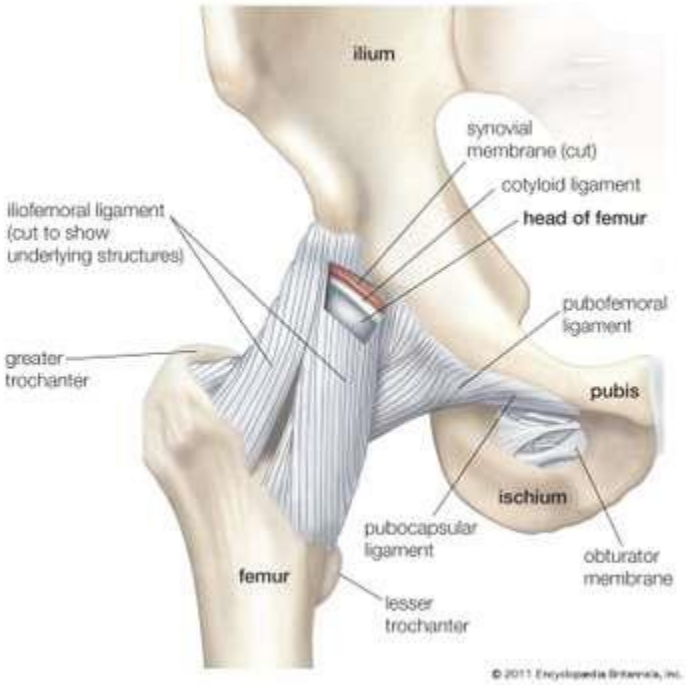
Encyclopædia Britannica, Inc.

In order to describe the main types of joint structures, it is helpful first to summarize the motions made possible by joints. These motions include spinning, swinging, gliding, rolling, and approximation.

Spin is a movement of a bone around its own long axis; it is denoted by the anatomical term *rotation*. An important example of spin is provided by the radius (outer bone of the forearm); this bone can spin upon the lower end of the humerus (upper arm) in all positions of the elbow. When an individual presses the back of the hand against the mouth, the forearm is pronated, or twisted; when the palm of the hand is pressed against the mouth, the forearm is supinated, or untwisted. Pronation is caused by medial (inward) rotation of the radius and supination by lateral (outward) rotation.

Types Of Joints

Joints can be classified in two ways: temporally and structurally. Each classification is associated with joint function.



human hip and pelvis

Anterior view of the hip and pelvis, showing attachment of ligaments to the femur, ilium, ischium, and pubis.

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Considered temporally, joints are either transient or permanent. The bones of a transient joint fuse together sooner or later, but always after birth. All the joints of the skull, for example, are transient except those of the middle ear and those between the lower jaw and the braincase. The bones of a permanent joint do not fuse except as the result of disease or surgery. Such fusion is called arthrodesis. All permanent and some transient joints permit movement. Movement of the latter may be temporary, as with the roof bones of an infant's skull during birth, or long-term, as with the joints of the base of the skull during postnatal development.

There are two basic structural types of joint: diarthrosis, in which fluid is present, and synarthrosis, in which there is no fluid. All the diarthroses (commonly called synovial joints) are permanent. Some of the synarthroses are transient; others are permanent.

Synarthroses

Synarthroses are divided into three classes: fibrous, symphysis, and cartilaginous.

Fibrous joints

In fibrous joints the articulating parts are separated by white connective tissue (collagen) fibres, which pass from one part to the other. There are two types of fibrous joints: suture and gomphosis

A suture is formed by the fibrous covering, or periosteum, of two bones passing between them. In the adult, sutures are found only in the roof and sides of the braincase and in the upper part of the face. In the infant, however, the two halves of the frontal bone are separated by a suture (the metopic suture), as are the two halves of the mandible at the chin. Excepting those of the fetus and newborn infant, all sutures are narrow. In the late fetus and the newborn child, the sagittal suture, which separates the right and left halves of the roof of the skull, is quite wide and markedly so at its anterior and posterior ends. This enables one of the halves to glide over the other during the passage of the child through the mother's pelvis during birth, thus reducing the width of its skull, a process called molding. (The effects of molding usually disappear quickly.) After birth, all sutures become immobile joints. The expanded anterior and posterior ends of the sagittal suture are called fontanels; they lie immediately above a large blood channel (superior sagittal sinus).

Sutures are transient; they are unossified parts of the skeleton that become fused at various times from childhood to old age. The fusion is effected by direct conversion of the sutures into bone. Until maturity the sutures are active sites of growth of the bones they separate

A gomphosis is a fibrous mobile peg-and-socket joint. The roots of the teeth (the pegs) fit into their sockets in the mandible and maxilla and are the only examples of this type of joint. Bundles of collagen fibres pass from the wall of the socket to the root; they are part of the circumdental, or periodontal, membrane. There is just enough space between the root and its socket to permit the root to be pressed a little farther into the socket during biting or chewing. Gomphoses are permanent joints in the sense that they last as long as do the roots of the teeth—unless, of course, they are damaged by disease.

The movement of the root within a gomphosis has a threefold effect. It lessens some of the impact between the upper and lower teeth in biting; it pumps blood and lymph from the periodontal membrane into the dental veins and lymph channels; and it stimulates sensory nerve terminals in the membrane to send signals to the brain centres that control the muscles of mastication.

Symphyses

A symphysis (fibrocartilaginous joint) is a joint in which the body (physis) of one bone meets the body of another. All but two of the symphyses lie in the vertebral (spinal) column, and all but one contain fibrocartilage as a constituent tissue. The short-lived suture between the two halves of the mandible is called the symphysis menti (from the Latin *mentum*, meaning "chin") and is the only symphysis devoid of fibrocartilage. All of the other s

ymphyses are permanent.

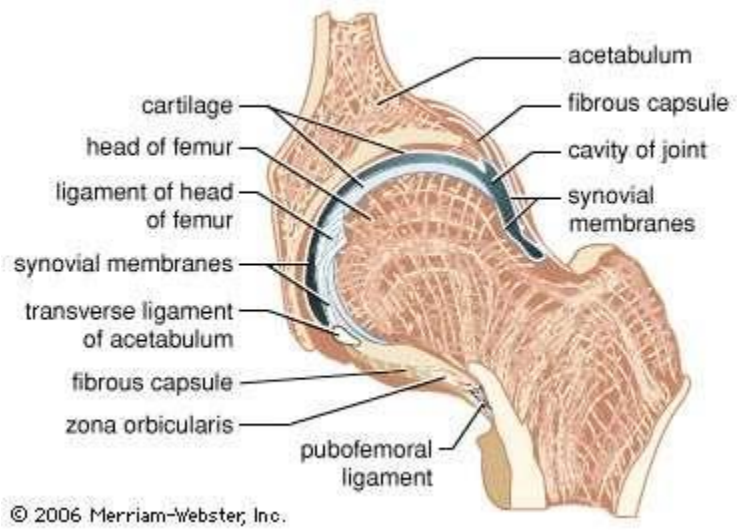
Cartilaginous joints

These joints, also called synchondroses, are the unossified masses between bones or parts of bones that pass through a cartilaginous stage before ossification. Examples are the synchondroses between the *occipital* and sphenoid bones and between the sphenoid and ethmoid bones of the floor of the *skull*. As already stated, these permit growth of the adjacent bones and act as virtual hinges at which the ethmoid and occipital bones swing upward upon the sphenoid; this allows backward growth of the *nose* and jaws during postnatal life. The juxta-epiphyseal plates separating the ossifying parts of a bone are also an example. Growth of the whole bone takes place at these plates when they appear, usually after birth. All synchondroses are *transient*, and all normally have vanished by the age of 25.

Diarthroses

Structure and elements of *synovial joints*

The synovial *bursas* are closed, thin-walled sacs, lined with synovial membrane. Bursas are found between structures that glide upon each other, and all motion at diarthroses entails some gliding, the amount varying from one joint to another. The bursal fluid, exuded by the synovial membrane, is called *synovia*, hence the common name for this class of joints. Two or more parts of the bursal wall become *cartilage* (chondrify) during prenatal life. These are the parts of the bursa that are attached to the *articulating* bones, and they *constitute* the articular cartilage of the bones.



hip joint

Section through a hip joint. The hip joint, a synovial joint, is of the ball-and-socket type, the head of the femur articulating with the cup-shaped acetabulum. The joint cavity is enclosed by a fibrous capsule lined with a type of connective tissue (synovial membrane) that produces a fluid (synovial fluid) that lubricates the cartilage-covered opposing surfaces of bone. The fibrous capsule is made up of internal circular fibres (zona orbicularis) and external longitudinal fibres, strengthened by ligaments, and covered by muscles.

The *elbow* is the joint connecting the upper arm to the forearm. It is classed as a hinge-type synovial joint.

In this article, we shall look at the anatomy of the elbow joint; its articulating surfaces, movements, stability, and the clinical relevance.

Elbow joint..

Structures of the Elbow Joint

Articulating Surfaces

It consists of two separate articulations:

- Trochlear notch of the ulna and the trochlea of the humerus
- Head of the radius and the capitulum of the humerus

Note: The *proximal radioulnar joint* is found within same joint capsule of the elbow, but most resources consider it as a separate articulation.

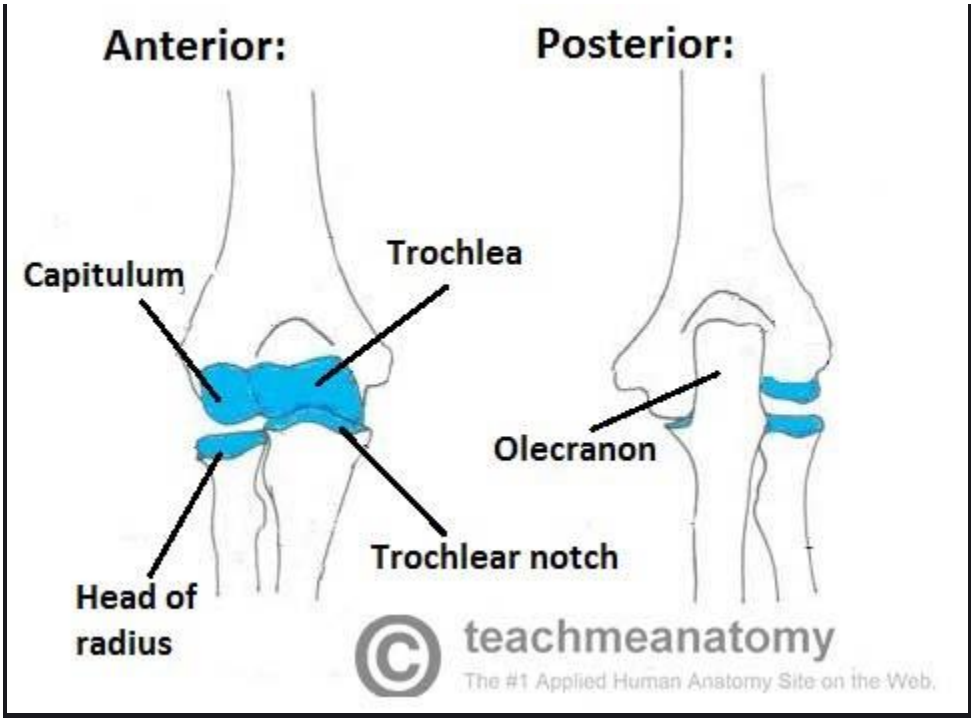


Fig 1 – Anterior and posterior views of the articulations of the elbow joint

Joint Capsule and Bursae

Like all synovial joints, the elbow joint has a capsule enclosing the joint. This in itself is strong and fibrous, strengthening the joint. The joint capsule is thickened medially and laterally to form collateral ligaments, which stabilise the flexing and extending motion of the arm.

A bursa is a membranous sac filled with synovial fluid. It acts as a cushion to reduce friction between the moving parts of a joint, limiting degenerative damage. There are many bursae in the elbow, but only a few have clinical importance:

- **Intratendinous** – located within the tendon of the triceps brachii.
- **Subtendinous** – between the olecranon and the tendon of the triceps brachii, reducing friction between the two structures during extension and flexion of the arm.
- **Subcutaneous (olecranon) bursa** – between the olecranon and the overlying connective tissue (implicated in olecranon bursitis).

Shoulder joint

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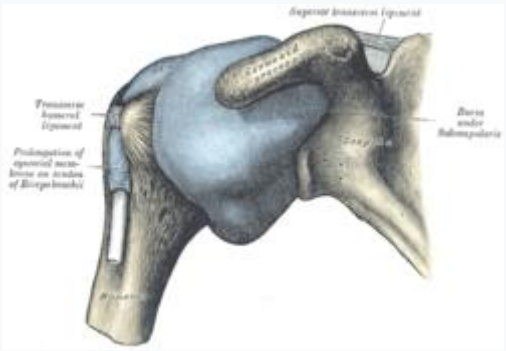
The **shoulder joint** (or **glenohumeral joint** from Greek *glene*, eyeball, + *-oid*, 'form of', + Latin *humerus*, *shoulder*) is structurally classified as a *synovial ball and socket joint* and functionally as a diarthrosis and multiaxial joint. It involves articulation between the *glenoid cavity* of the *scapula* (shoulder blade) and the *head of the humerus* (upper *arm bone*).

Shoulder joint



The right *shoulder* and shoulder joint

Hinge Joint

A hinge joint is a common class of synovial joint that includes the ankle, elbow, and knee joints. Hinge joints are formed between two or more bones where the bones can only move along one axis to flex or extend.

The simplest hinge joints in the body are the interphalangeal joints found between the phalanges of the fingers and toes. In these hinge joints, the bones are able to flex to decrease the angle between them - like when making a fist or curling the toes - and extend to increase their angle to about 180 degrees when holding the foot or hand flat.

Pivot joints

Pivot joints, also known as **rotary joints**, are a type of synovial joint that permit axial rotation. The moving bone rotates within a ring formed by the concave surface of a second bone and an adjoining ligament.

Movements

Pivot joints allow rotation around a single axis only and therefore mechanically speaking they possess only **one degree of freedom**.

- axial rotation

Examples

- median atlantoaxial joint between the dens of C2 and the anterior arch of C1
- proximal radioulnar joint at the elbow
- distal radioulnar joint at the wrist

The proximal and distal radioulnar joints pivot together such that the radius twists around the ulnar to allow pronation and supination of the forearm.

Thanks God the Assigment is complete

THE End!!!!!!!!!!!!!!