

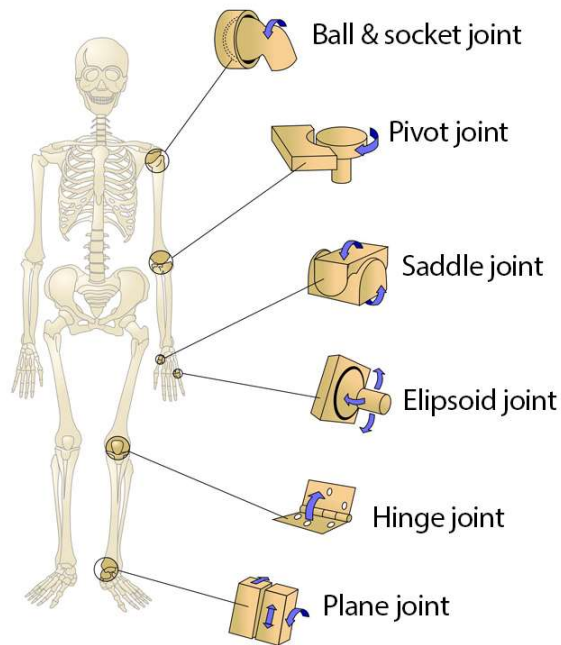
| | | |
|-----------------|--|--|
| Plantar flexion | Pointing foot/toes downwards | Pointing toes |
| Elevation | Lifting upwards (shoulders) | Shrug shoulders up |
| Depression | Movement of body part down | Shoulders back down |
| Protraction | Moving shoulder girdle forwards | Turn shoulders inwards towards centre of chest |
| Retraction | Moving shoulder girdle backwards | Move shoulders back (e.g. when sitting or standing up straight) |
| Lateral flexion | Bending sideways around the vertebral column | Side bend from standing position (moving upper body over to side from waist) |
| Pronation | Turning the palm of the hand downwards | Turn hand as if you are putting your hand out to receive something |
| Supination | Turning the palm of the hand upwards | Turn hand over so the palm is down |
| Inversion | Turning the soles of the foot inwards | Turn foot inwards as if looking at the sole of the foot |
| Eversion | Turning the soles of the foot outwards | Turn foot outwards as if looking at the sole of the foot |

Joints

Joints occur whenever two or more bones meet at the same point. Bone surfaces at a joint are covered with **articular cartilage** which provides a smooth surface for movement.

Joints are classified based upon whether there is a space between the articulating bones and the type of connective tissue connecting the joint.

Joints such as the sacrum or lower lumbar vertebrae are **fused joints**, which offer no movement.



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Text

Ball and socket joint

Pivot joint

Saddle joint

Elipsoid joint

Hinge joint

Plane joint

There are three **classifications** of joints in the human body.

Fibrous (fixed) joints are held together by **collagenous connective tissue** and there is no cavity, as shown in the cranium.

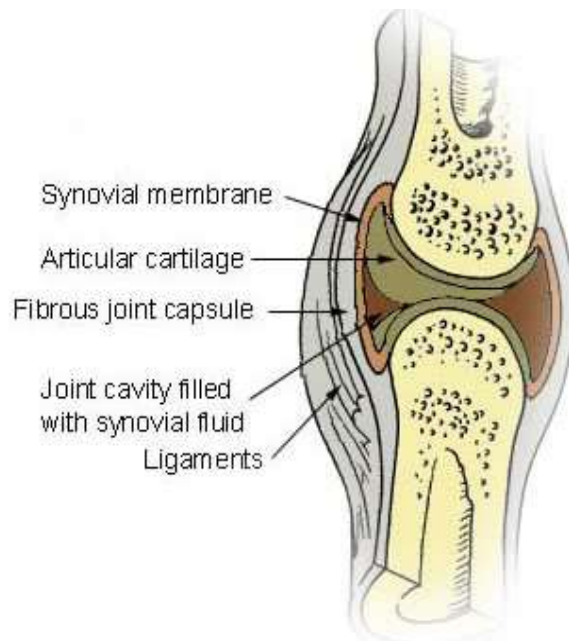
Cartilaginous joints are slightly moveable – these have no cavity and bones are connected together by cartilage as in the symphysis pubis in the pelvic girdle.

The third and most common classification of a joint in the human body is the **synovial joint**.

Synovial joints

Synovial joints are the most common type of joint found in the musculo-skeletal system. They have a **synovial cavity**, and the bones are usually surrounded by an **articular capsule** and **ligaments**.

Where the bones of a freely movable joint rub together, they are covered with shiny, slippery cartilage called **hyaline cartilage** and the joints are lubricated by a liquid called **synovial fluid**. This fluid is sealed in by the **synovial membrane** which surrounds the whole joint. The bones of freely movable joints are held in place but allowed to move freely by bands of connective tissue called **ligaments** which join one bone to another.



(files/images/lllu_synovial_joint.jpg?1612187604376)Wikimedia

(https://commons.wikimedia.org/wiki/File:lllu_synovial_joint.jpg) / Public domain

Text

- Synovial membrane
- Articular cartilage
- Fibrous joint capsule
- Joint cavity filled with synovial fluid
- Ligaments

Types of synovial joint

Synovial joints are classified according to their structure and the movement they allow. Here are the 6 types of synovial joints

Ball and socket joint

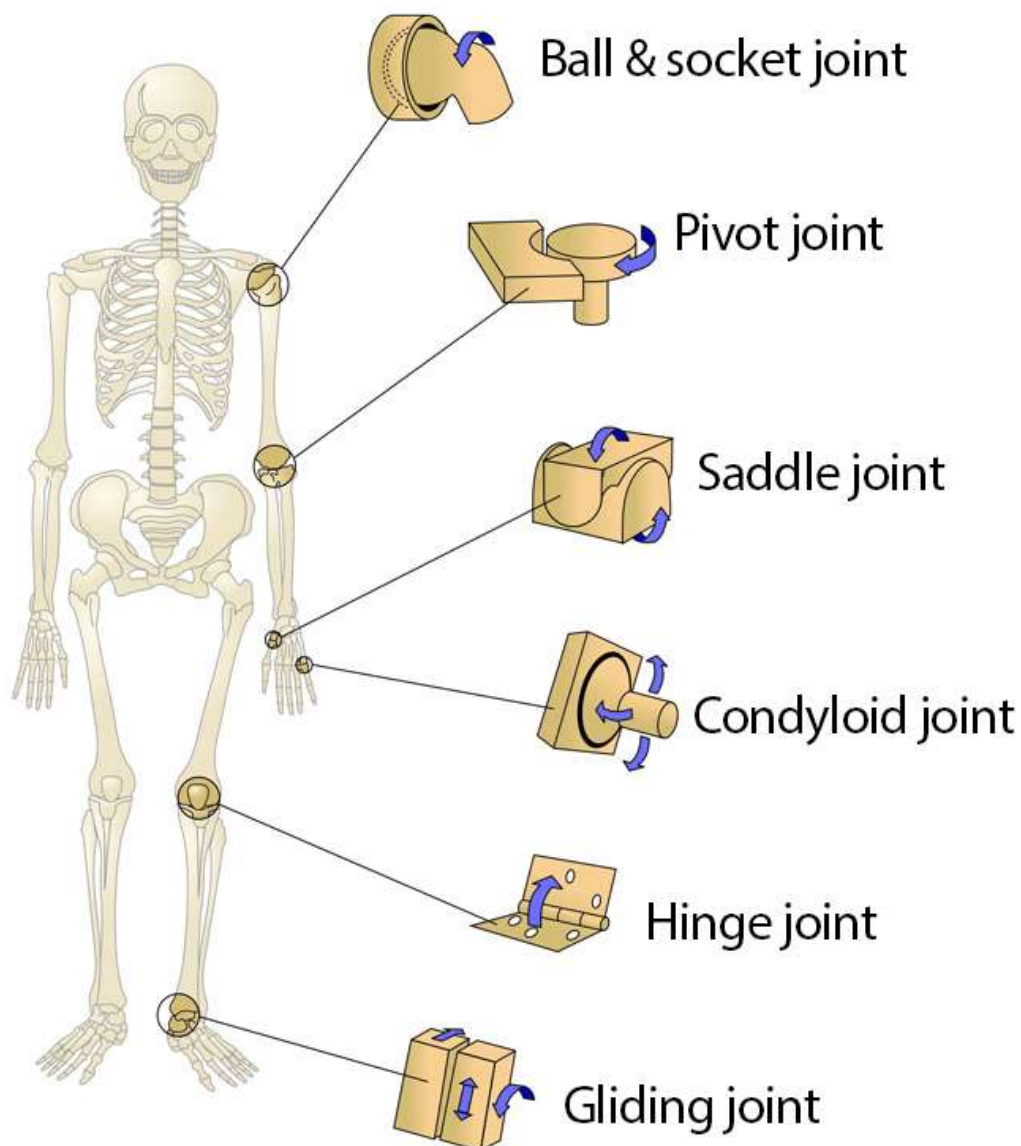
Pivot joint

Saddle joint

Condylloid joint

Hinge joint

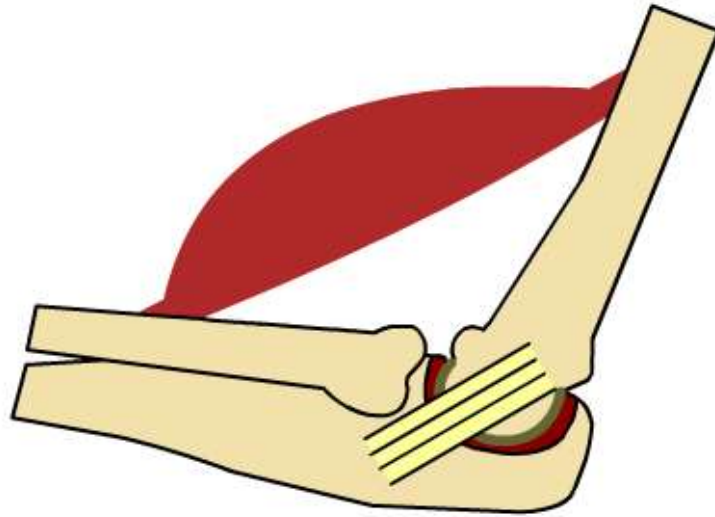
Gliding joint



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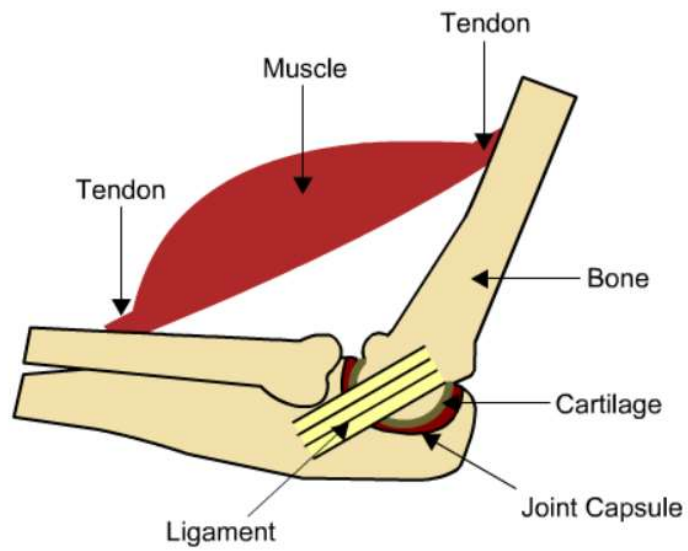
Tendons and ligaments

Tendons and ligaments are both formed from **connective tissue**. Tendons join muscles to bone, and ligaments join bone to bone, so they are usually found where muscles cross a joint and where two bones meet. For example, the tendon connecting the quadriceps muscles to the tibia goes through the knee joint, and collateral and cruciate ligaments are also present within the structure of the knee joint providing additional strength and protection for the joint.



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Tendon

Muscle

Tendon

Bone

Carilage

Joint Capsule

Ligament

Tendons are formed from the outer layers of connective tissue surrounding muscle fibres and connect the end of the muscle to the bone to allow movement when the muscle contracts.

Ligaments connect one bone with another and also increase **joint stability**. The fibres of the outer layer of a ligament grow into the periosteum of the bone itself, forming a very strong bond. The attachments of ligaments and tendons can be so strong that a muscular contraction or ligament sprain can take a piece of bone away rather than rupture the fusion of the connective tissue with the periosteum.

Quiz

Now test your knowledge of synovial joints.

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(https://edu-dev.wp.uhi.ac.uk/wp-admin/admin-ajax.php?action=h5p_embed&id=158)

Factors affecting joint mobility

There are several factors which affect the amount of mobility and flexibility at a joint.

- Shape and compatibility of the joint surfaces
- Impingement of bony structures around a joint
- The limiting effect of muscles, skin and adipose tissue
- Temperature
- Increasing age

Shape and compatibility of the joint surfaces

The shape of the joint surfaces where two bones meet determines the type and range of movement. For example, the socket of the shoulder joint is quite shallow and allows a large range of movement. The humerus and ulna are shaped in such a way as to permit movement in one plane only, at the elbow joint.