

Investigation

3.7B: Joints

All normal bending of our body occurs at **joints**. Whether you straighten your knee, make a circle with your arm, flex your wrist, or turn your head, the bending occurs at one or more joints. Without moveable joints we would essentially be statues.

Our hip and shoulder joints are **ball and socket** joints capable of motion through a range of angles and directions. Flexible hip joints allow us to jump over a hurdle or do splits. Without a ball and socket shoulder joint you could not raise your arm so freely over your head.

Our knees, elbows, fingers, and toes act as **hinge** joints, moving along a single **axis** of **flexion** and **extension**. Flexing the elbow allows you to lift a glass of water to take a drink. Extending your knee allows you to stand up from your chair.

The bones on either side of a moveable joint maintain their connection by way of **ligaments**; without ligaments we would not have the tethering of bones required to create the **leverage** needed to do work. The actual energy for movement comes from the surrounding **muscles**; flexion of the elbows is produced by the **biceps** muscle, while extension is created by the **triceps**.

We also have joints we classify as slightly moveable and non-moveable. Technically a joint occurs wherever two bones meet. In some cases we desire very minimal movement from a joint, such as between the bones of the **spine**. Some joints begin as moveable and, during **maturation**, fuse together, such as the bones of our **skull**. In infancy these bones connect together loosely to allow growth; **fusion** of the bones occurs at the completion of growth when we all become 'hard heads'. (just kidding).

All joints have an enclosure, or boundary, surrounding them, a barrier known as the joint capsule. Within the capsule **lubrication** of the joint surfaces by **synovial fluid** protects the joint surfaces from grinding away the protective **articulating cartilage** surface of bone.

A mechanic puts grease into the "joints" in your parents' automobile for exactly the same purpose. As we reach middle to old age we produce less synovial fluid, often resulting in

the **degeneration** of joint surfaces known as **osteoarthritis**. In some unfortunate people their own immune systems attack their joints as if they were foreign invaders, a condition we call **rheumatoid arthritis**.

Healthy and properly functioning joints contribute immensely to our quality of life. Those having unhealthy joints may suffer from the inability to perform even the activities of normal living. They may suffer chronic pain and their inactivity of limitations can lead to depression and even desperation. Restoring joint function and reducing pain and disability are important contributions provided by Orthopedists when they restore quality of life to their patients.