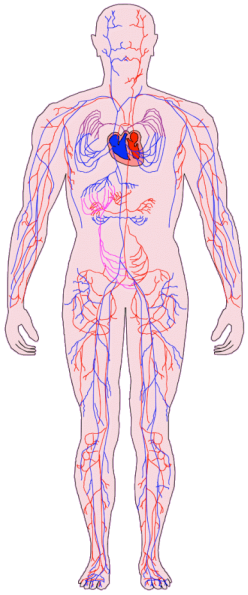
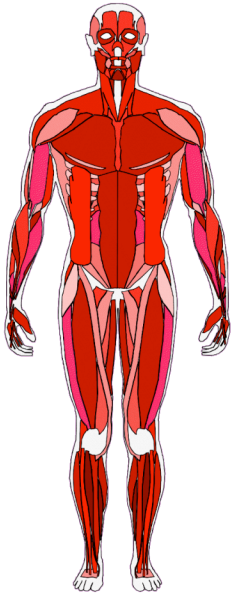
Bones and Joints

Body Systems involved in Exercise

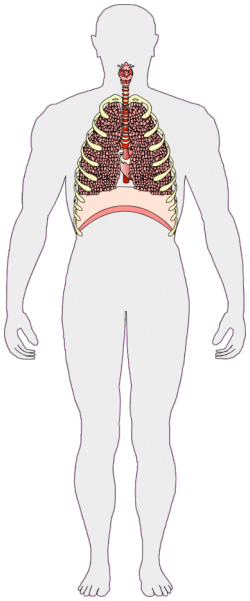
Circulatory



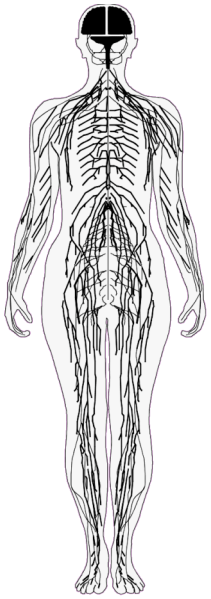
Muscular

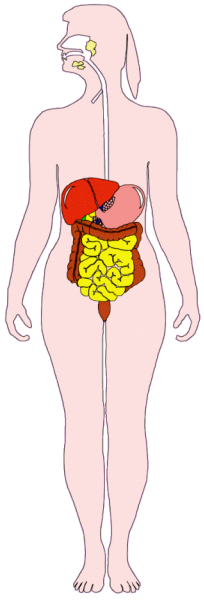


Respiratory

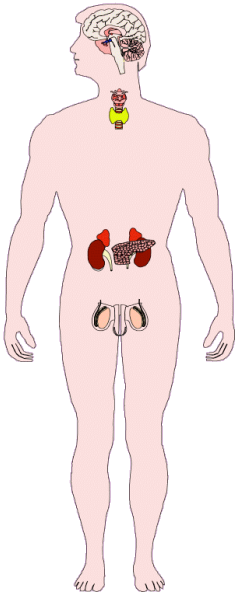


Nervous

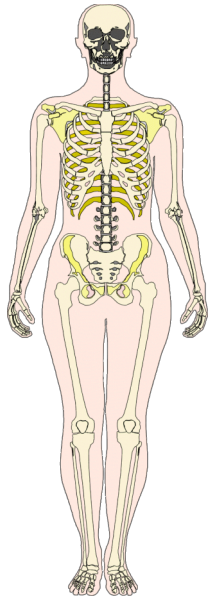




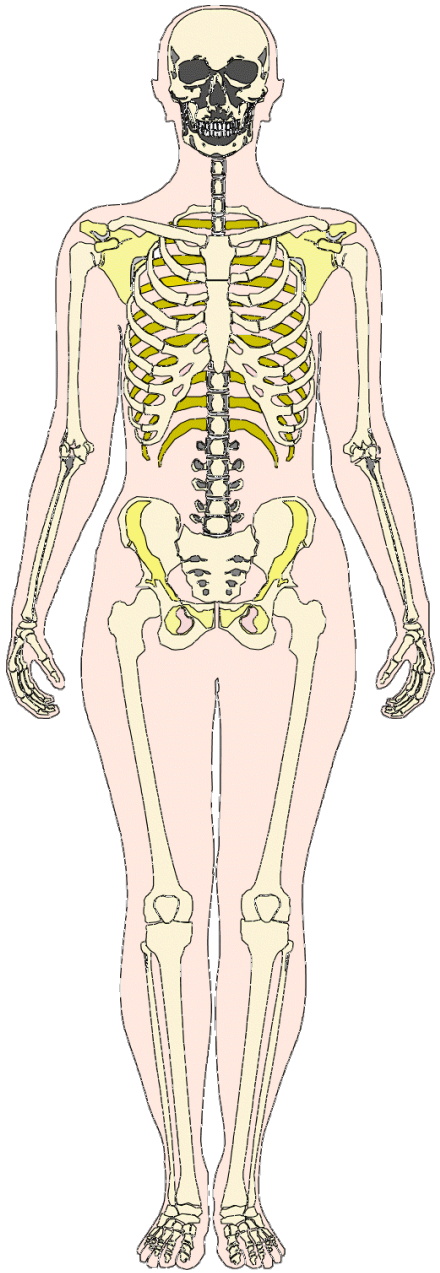
Digestive



Hormonal



Skeletal

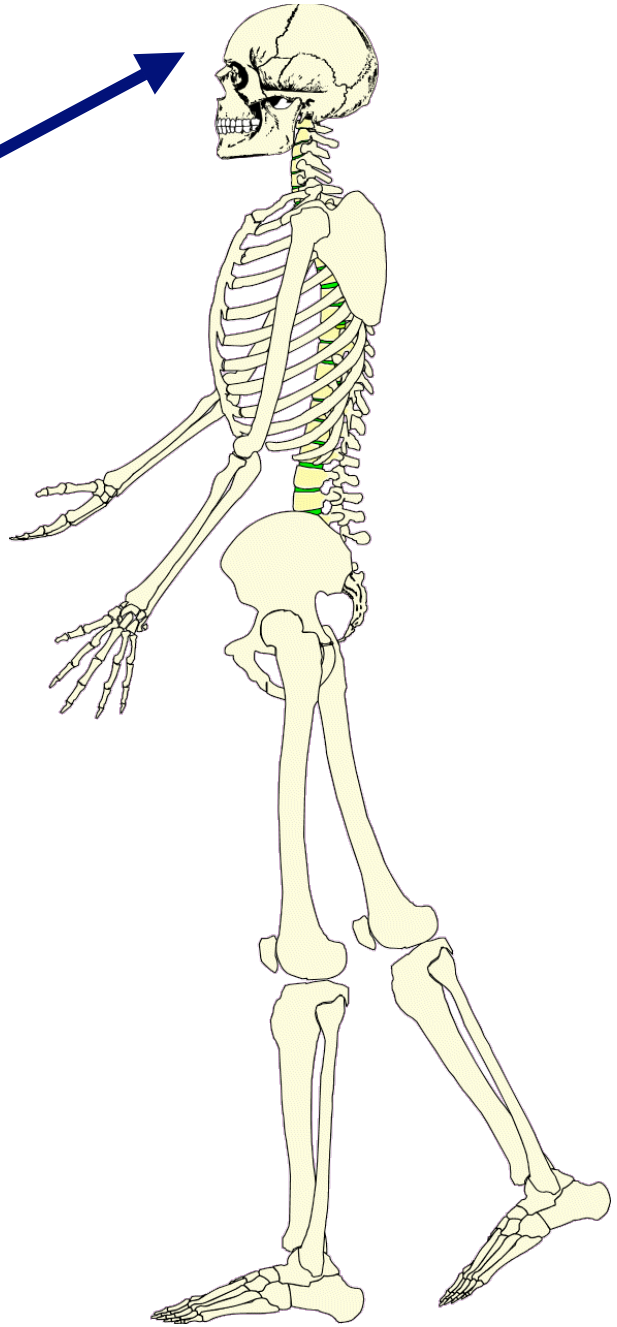


Skeletal And Bones

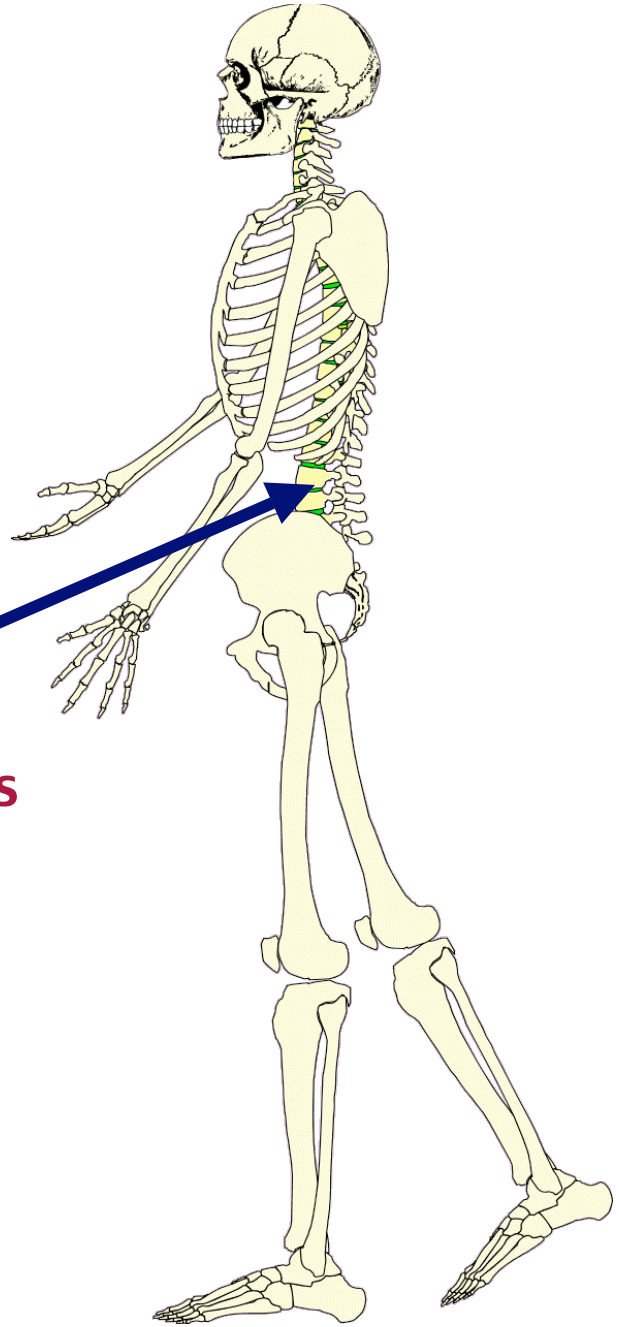
Functions of the Skeleton

1. Protection

The cranium protects the soft tissue of the brain.



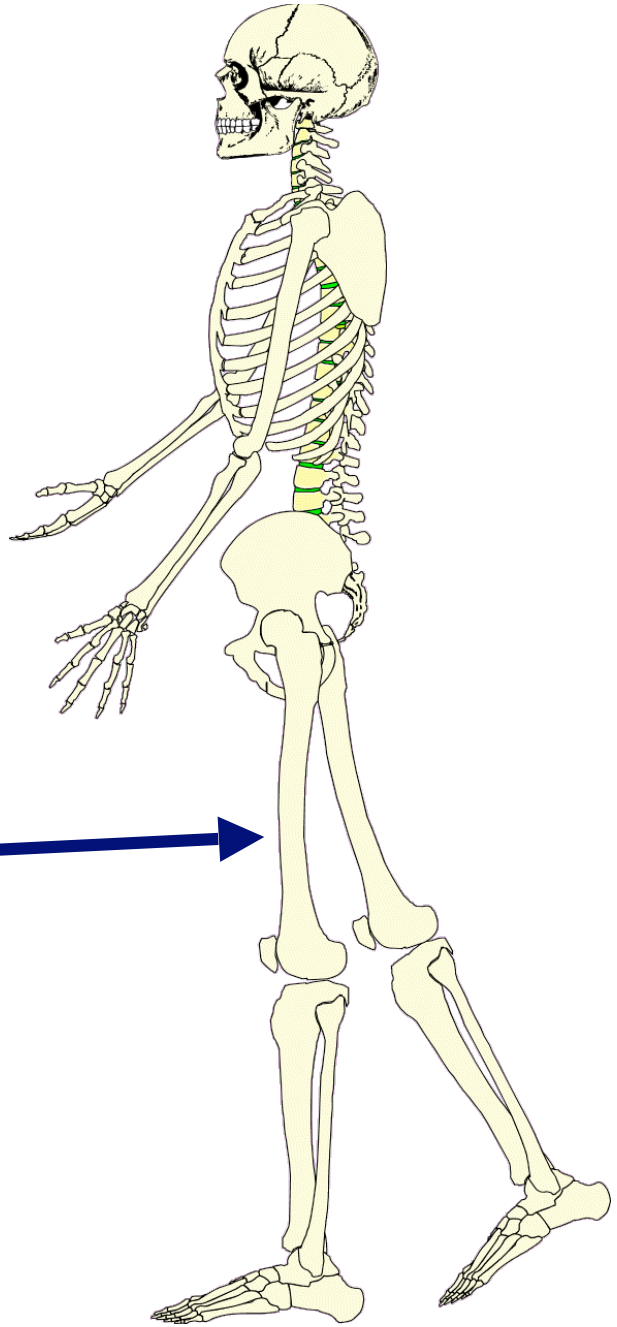
Functions of the Skeleton



2. Movement

The vertebrae allow us to bend, stretch and rotate our body.

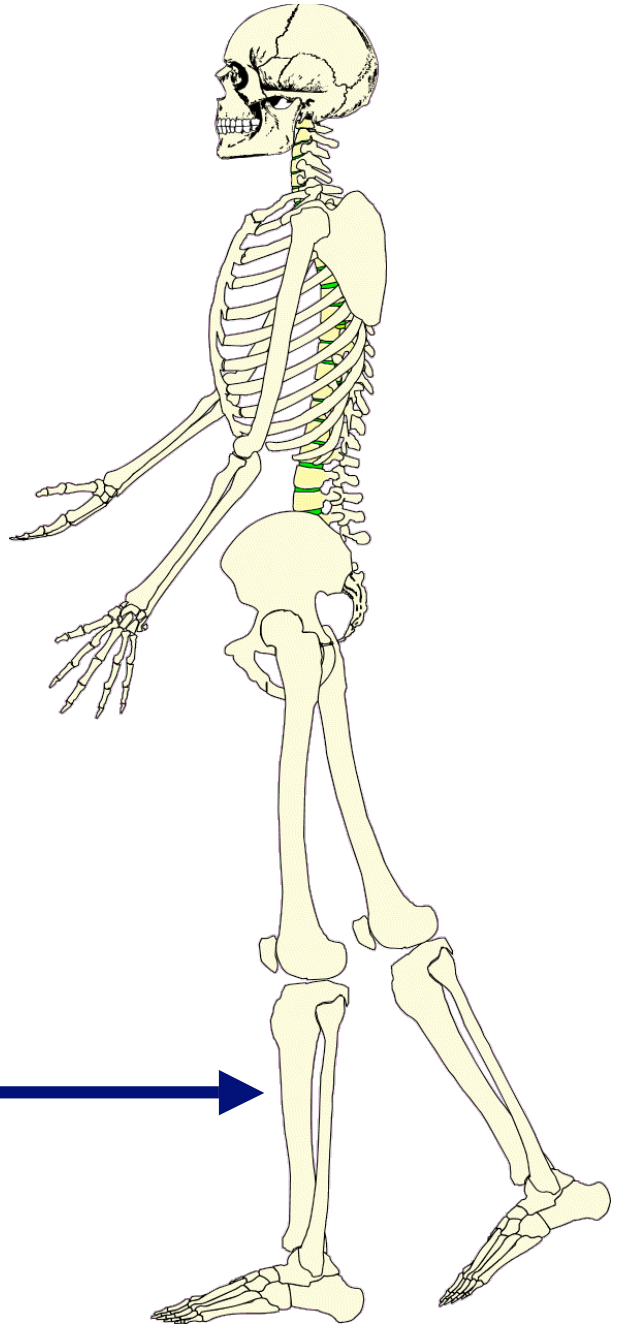
Functions of the Skeleton



3. Blood Production

Red blood cells are made in the ribs and limb bones.

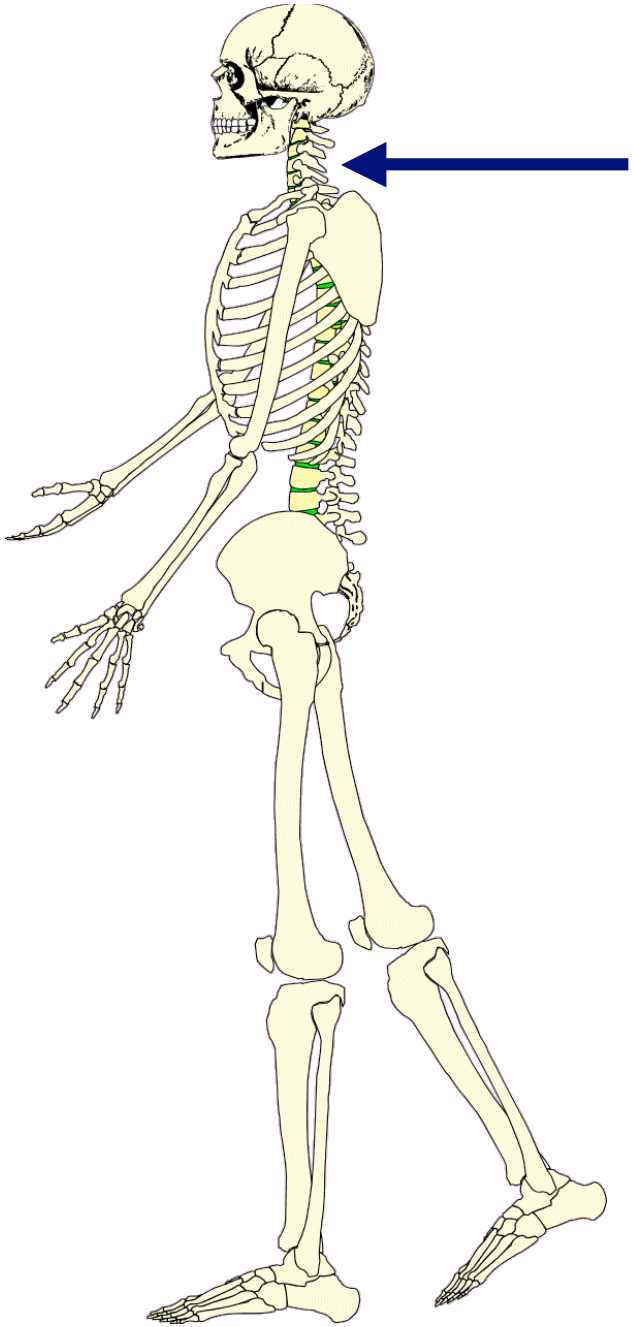
Functions of the Skeleton



4. Support

The bones of the legs support the body.

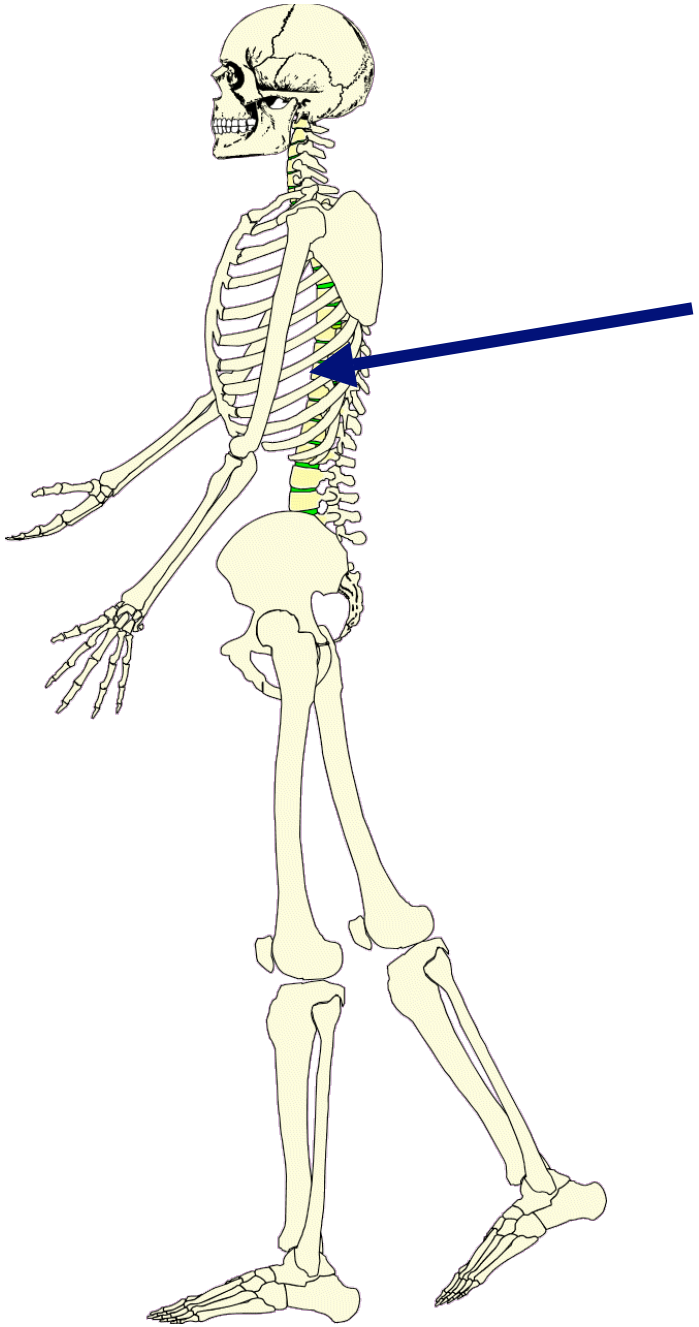
Functions of the Skeleton



5. Support

The vertebrae support the head.

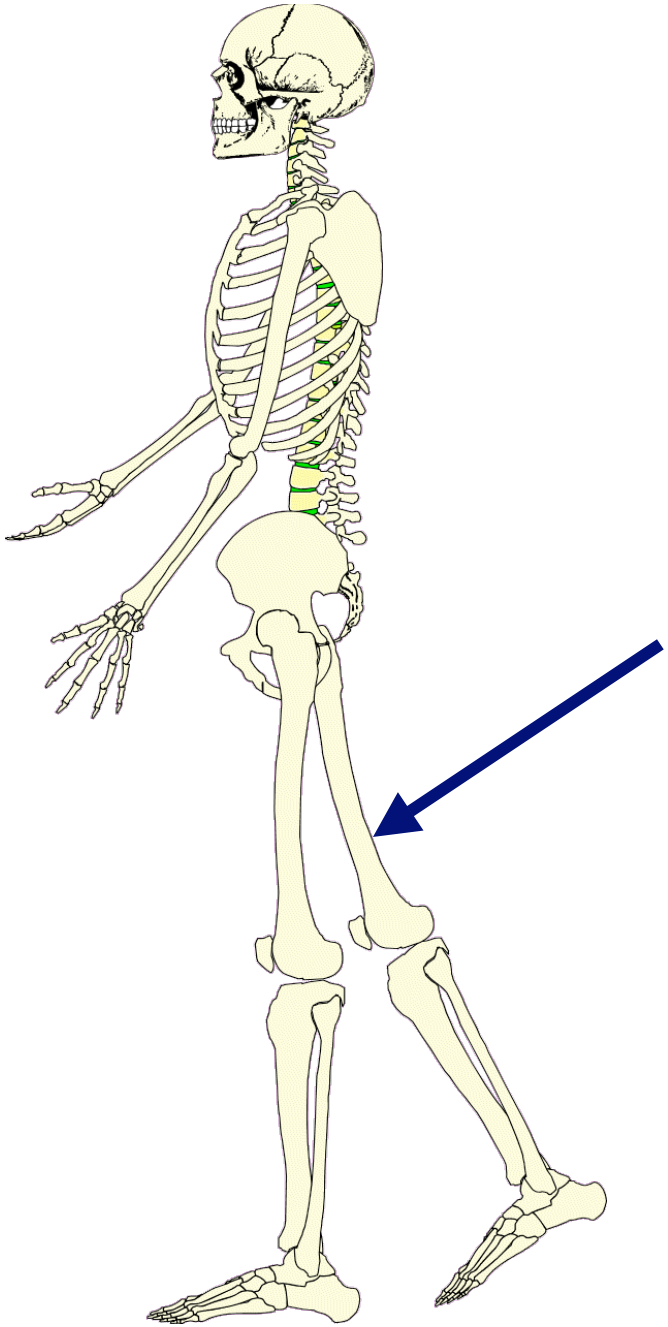
Functions of the Skeleton



6. Protection

The rib cage protects the delicate heart and lungs.

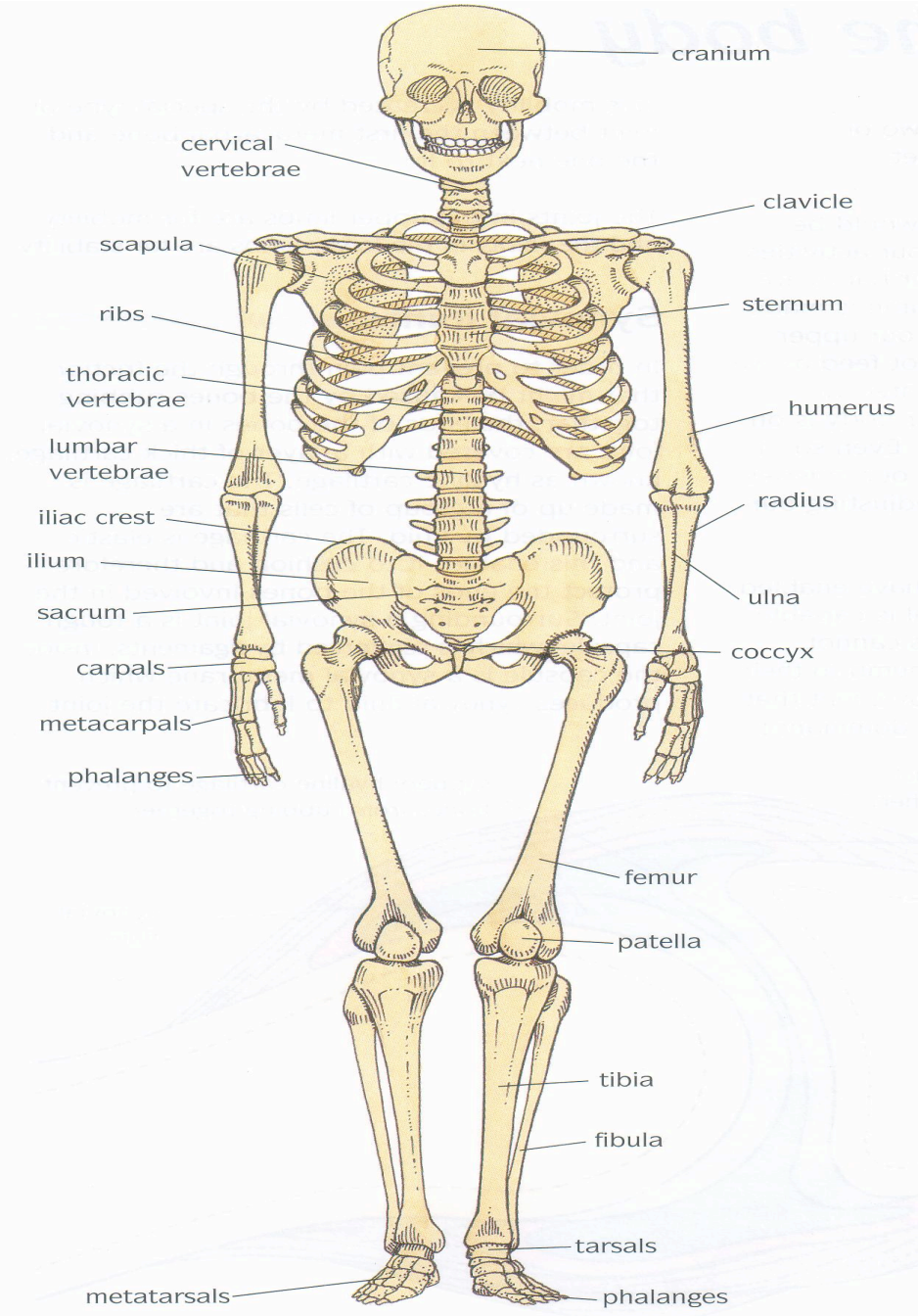
Functions of the Skeleton



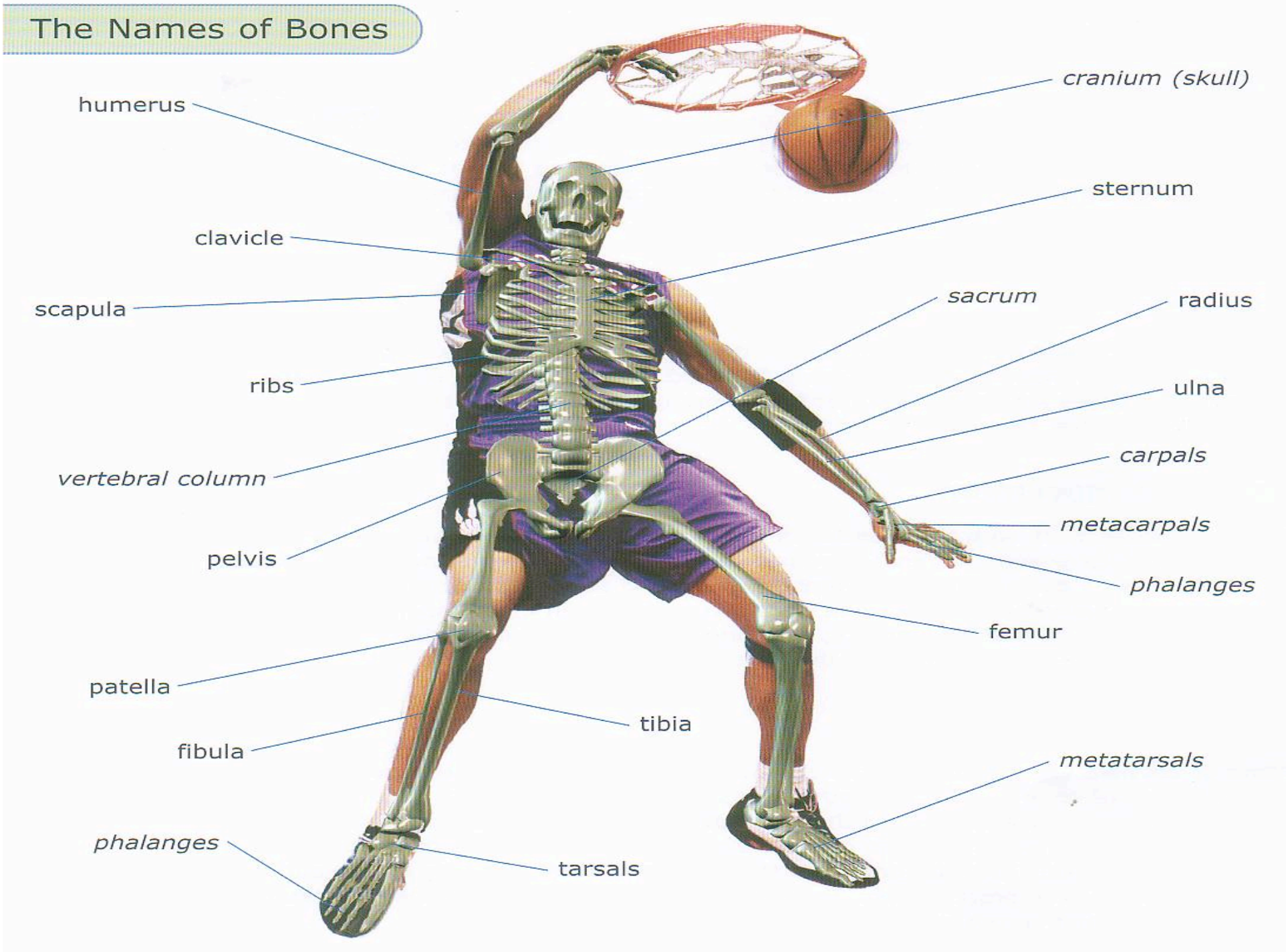
7. Movement

The bones and joints work with muscles to enable us to walk, run and sprint.

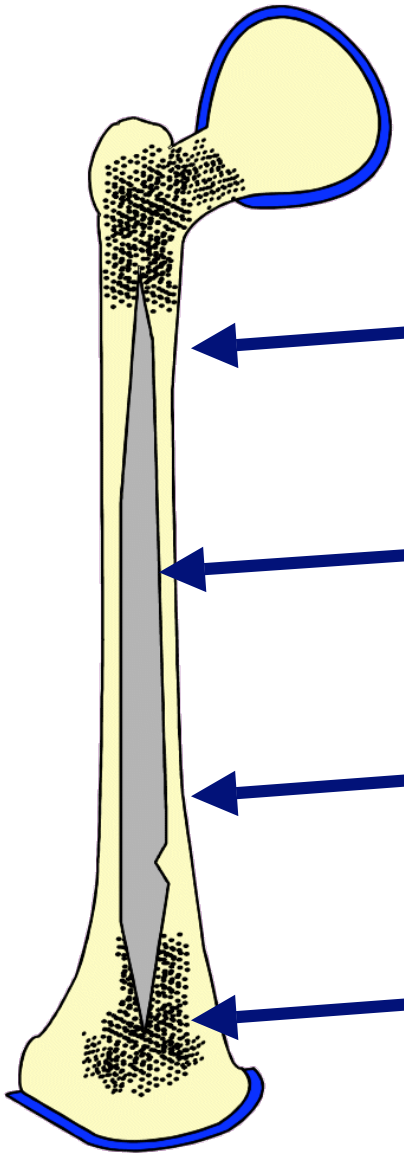
Name of the Bones



The Names of Bones



Bones



Cartilage

Periosteum

Bone Marrow

Compact Bone

Spongy Bone

Bones

Bones start to grow inside the womb, where they begin as cartilage.

As you get older this turns into hard bone by a process called ossification.

Bones will only grow properly as long as certain minerals and vitamins are eaten:

Vitamin D helps build bone.

Calcium is a mineral which helps keep bones strong.

Bones

Even as a fully–grown adult, the bone structure is always changing, as vitamins and minerals are constantly replaced.

A poor diet will result in soft bones, while a balanced diet and exercise will make bones strong.

Bone Types

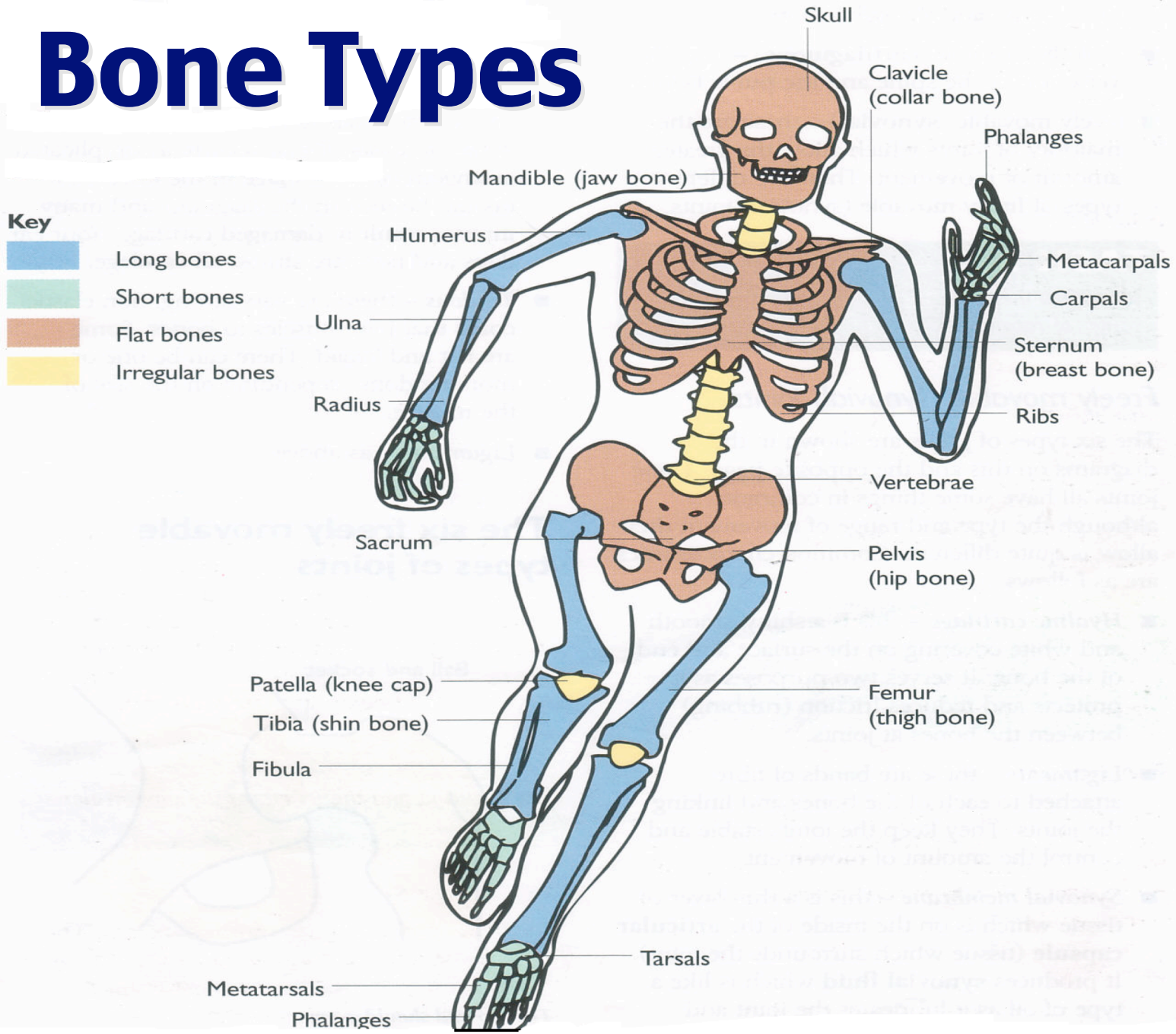
1. Flat Bones (Protection)

2. Irregular Bones (Protection)

3. Long Bones (Levers)

4. Short Bones

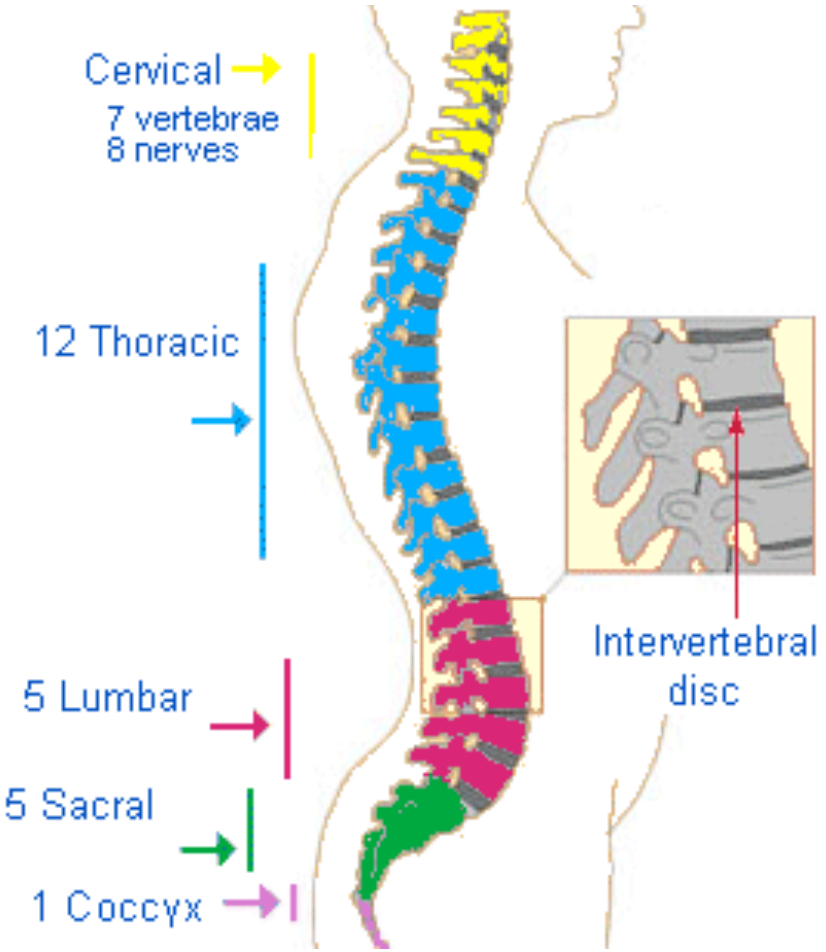
Bone Types


Skull
Clavicle
(collar bone)
Phalanges
Mandible (jaw bone)
Humerus
Metacarpals
Carpals
Ulna
Sternum
(breast bone)
Radius
Ribs
Vertebrae
Sacrum
Pelvis
(hip bone)
Patella (knee cap)
Femur
(thigh bone)
Tibia (shin bone)
Fibula
Tarsals
Metatarsals
Phalanges
Key
Long bones
Short bones
Flat bones
Irregular bones

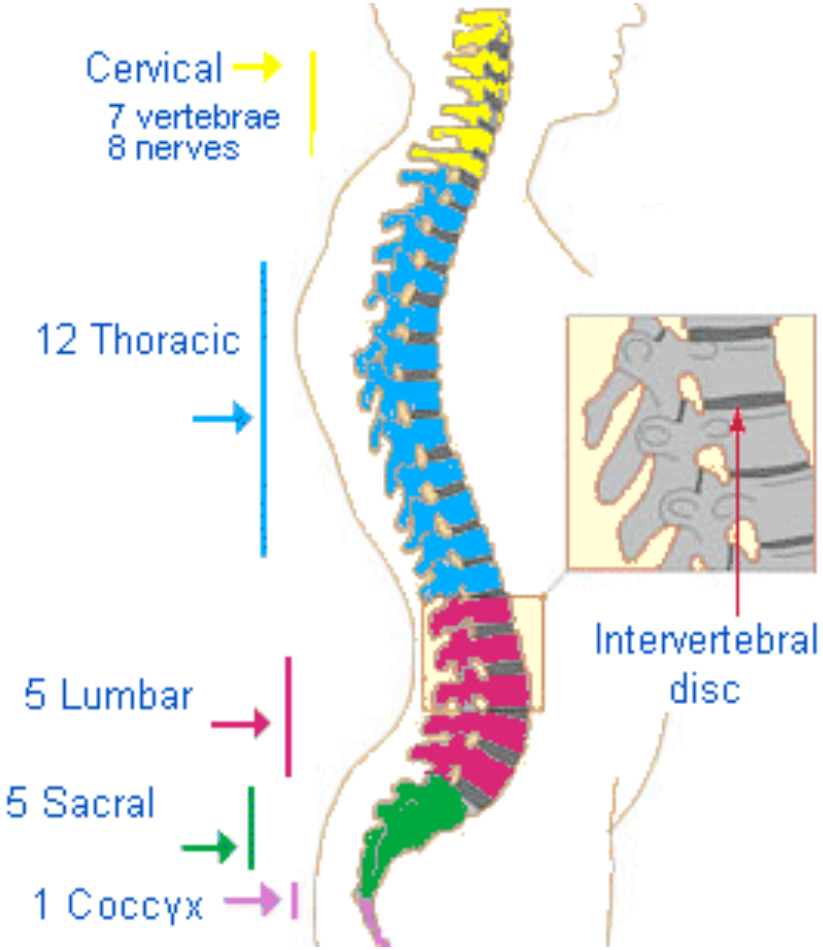
The Vertebral Column

The vertebral column, Known as the spine or spinal column

- **protects spinal cord**
- **supports upper body**
- **allows wide range of movement**
- **is important for posture**
- **transmits force to body parts**



The Vertebral Column



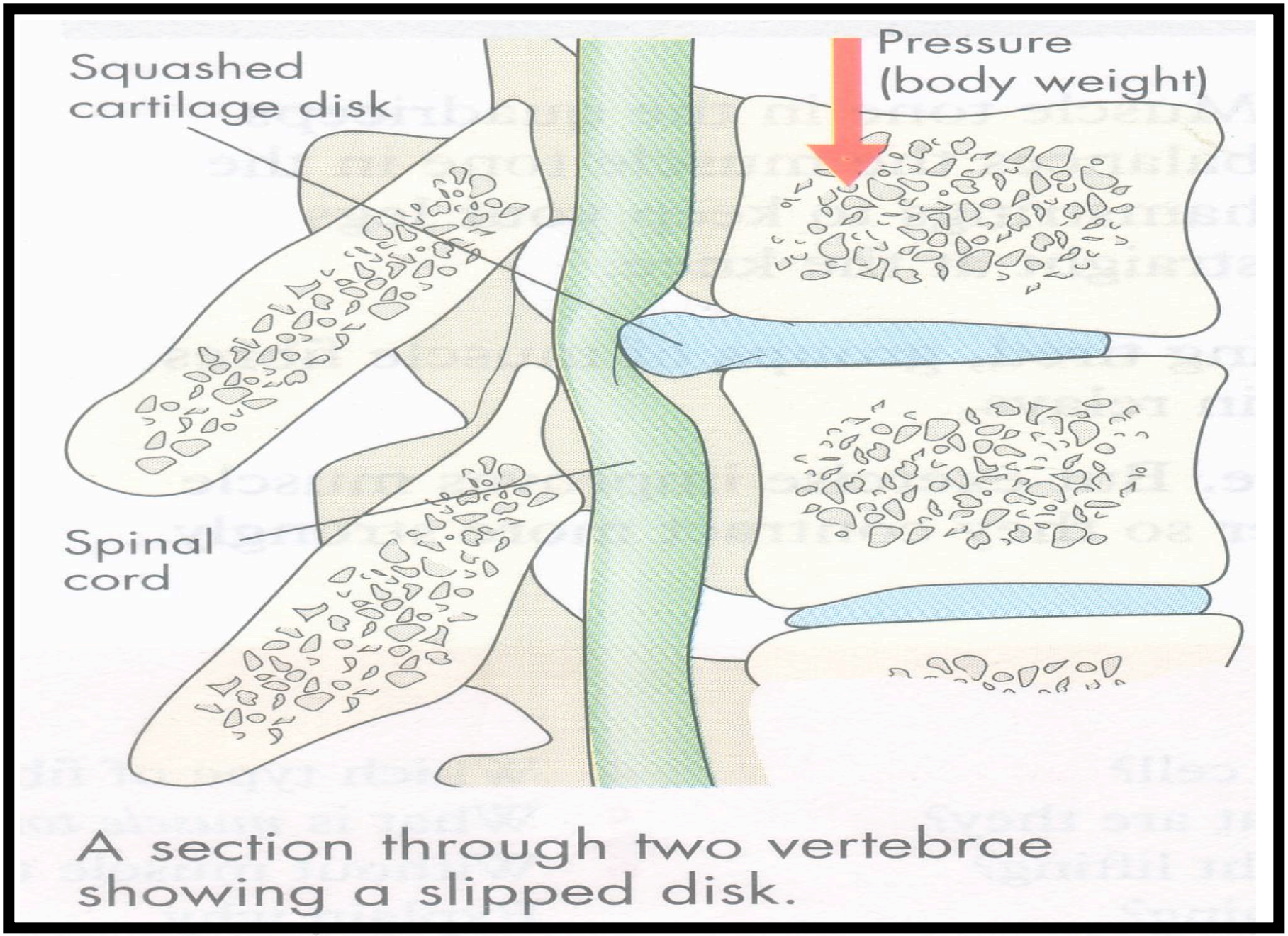
The 33 specialized vertebrae are made up of:

7 cervical vertebrae
12 thoracic vertebrae
5 lumbar vertebrae
5 sacral vertebrae
4 Bones fused together to make up the coccyx

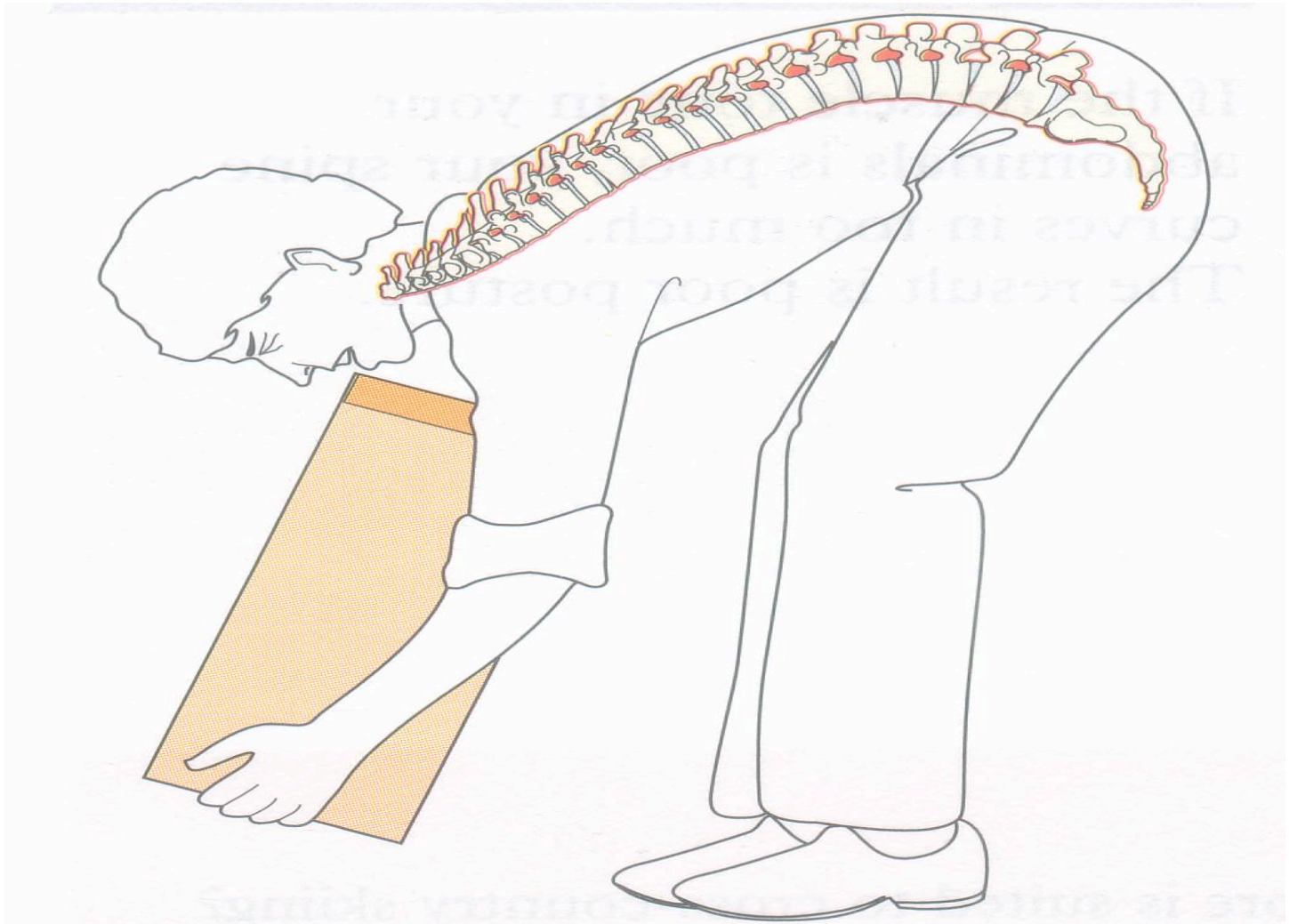
The Vertebral Column

All the vertebrae fit neatly together to protect the spinal chord.

Between each vertebrae is an Intervertebral disc. These discs are very delicate and if put out of action by slipping out of place or tearing, the patient is said to have "slipped a disc".



A section through two vertebrae showing a slipped disk.

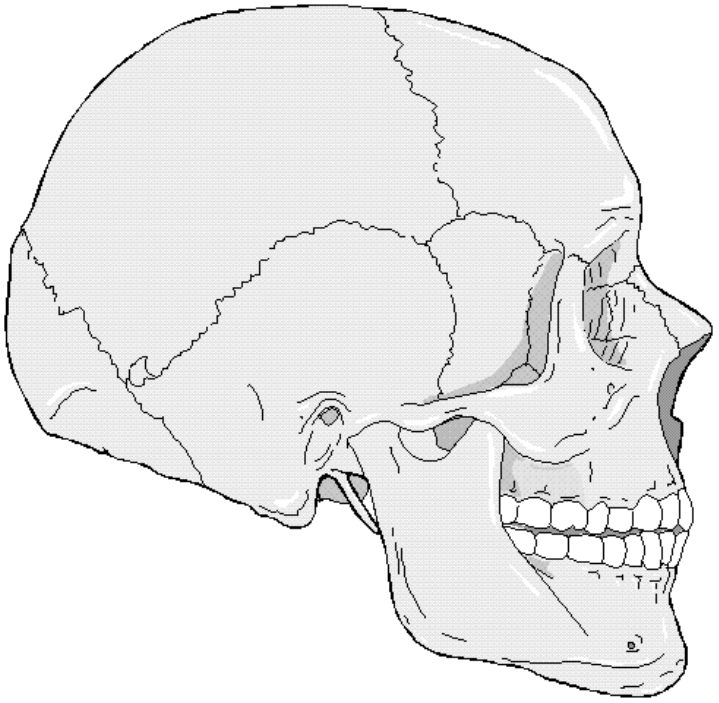


Lifting a heavy weight this way can damage your spine.

Joints of the Body

A place where two or more bones meet.

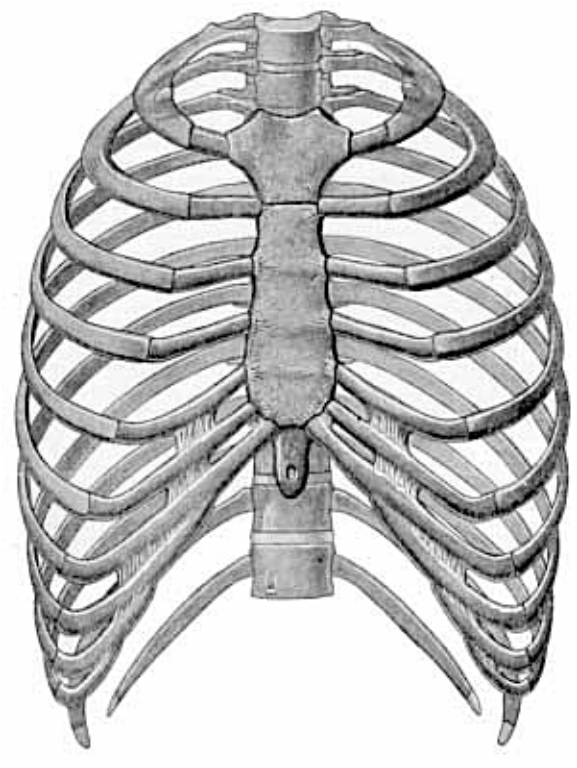
Joints of the Body



Fibrous

Fibrous joints connect bones without allowing any movement. The bones of your skull and pelvis are held together by fibrous joints. The union of the spinous processes and vertebrae are fibrous joints.

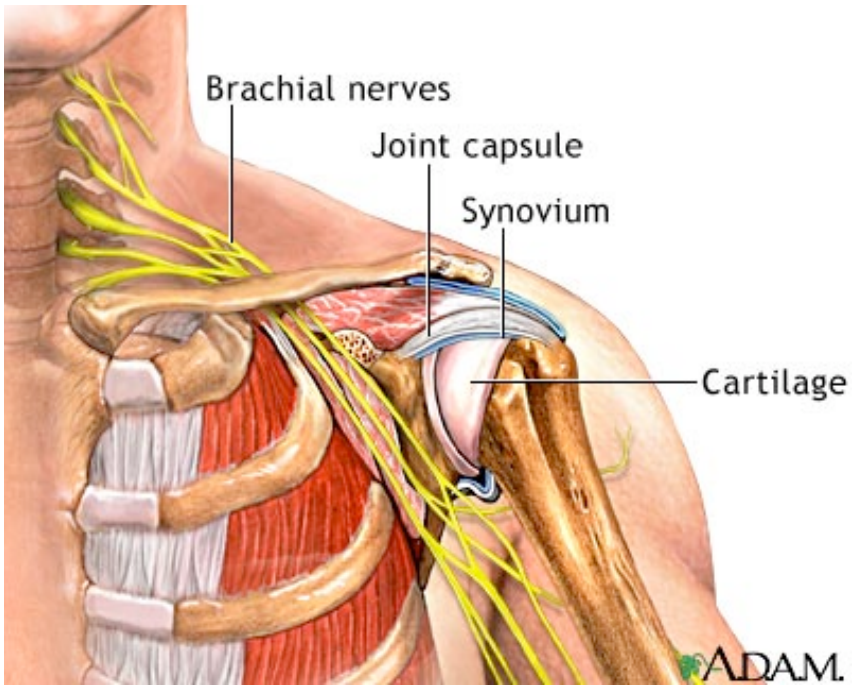
Joints of the Body



Cartilaginous

Cartilaginous joints are joints in which the bones are attached by cartilage. These joints allow for only a little movement, such as the spine or ribs.

Joints of the Body



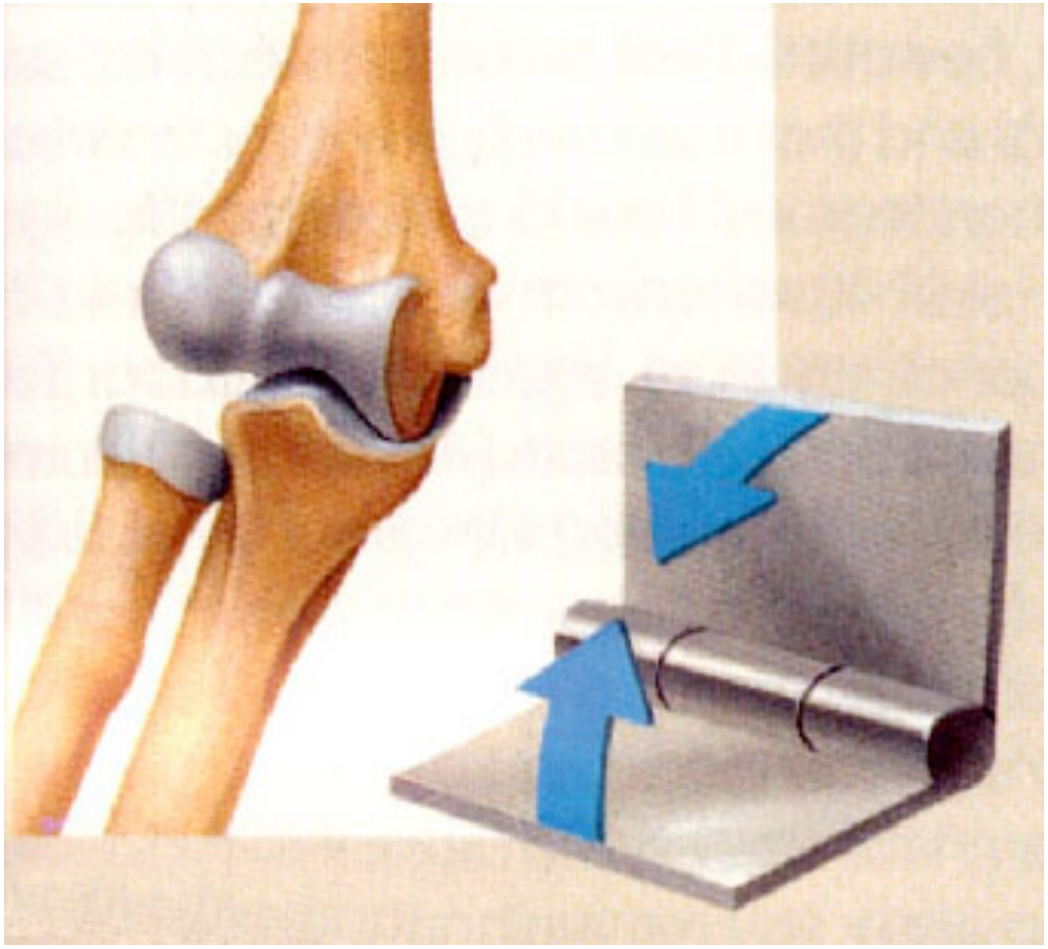
Synovial

Synovial joints allow for much more movement than cartilaginous joints. Cavaties between bones in synovial joints are filled with synovial fluid. This fluid helps lubricate and protect the bones.

Synovial Joints

Hinge

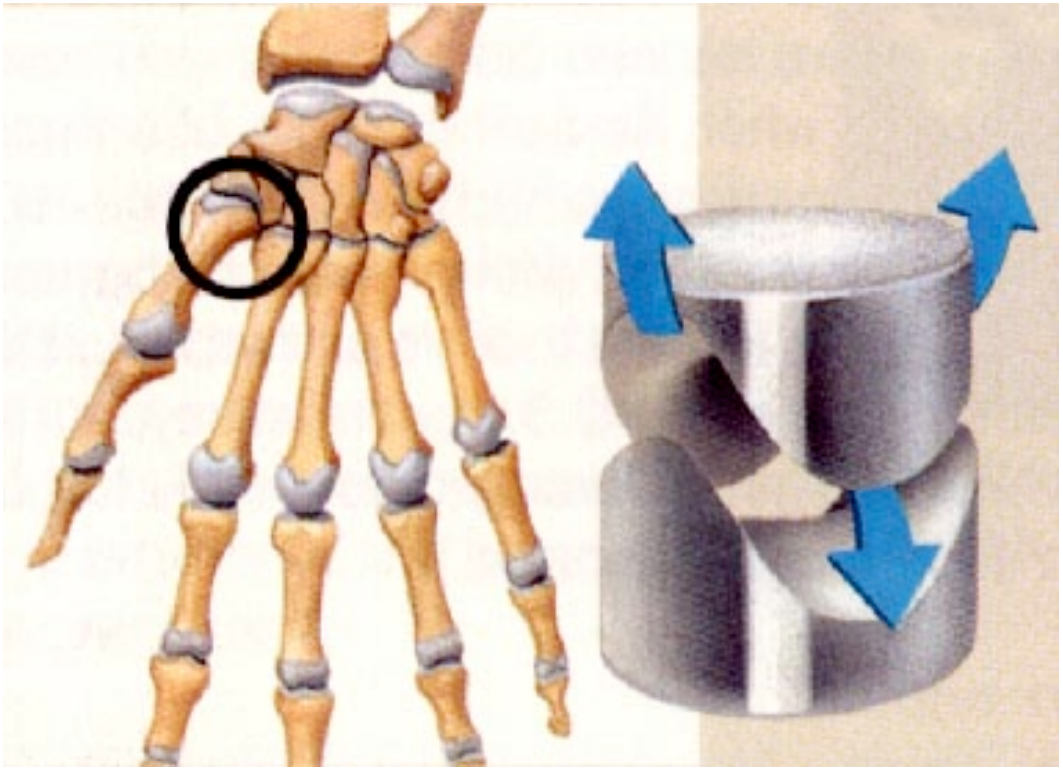
A hinge joint allows extension and retraction of an apendage.



Synovial Joints

Saddle

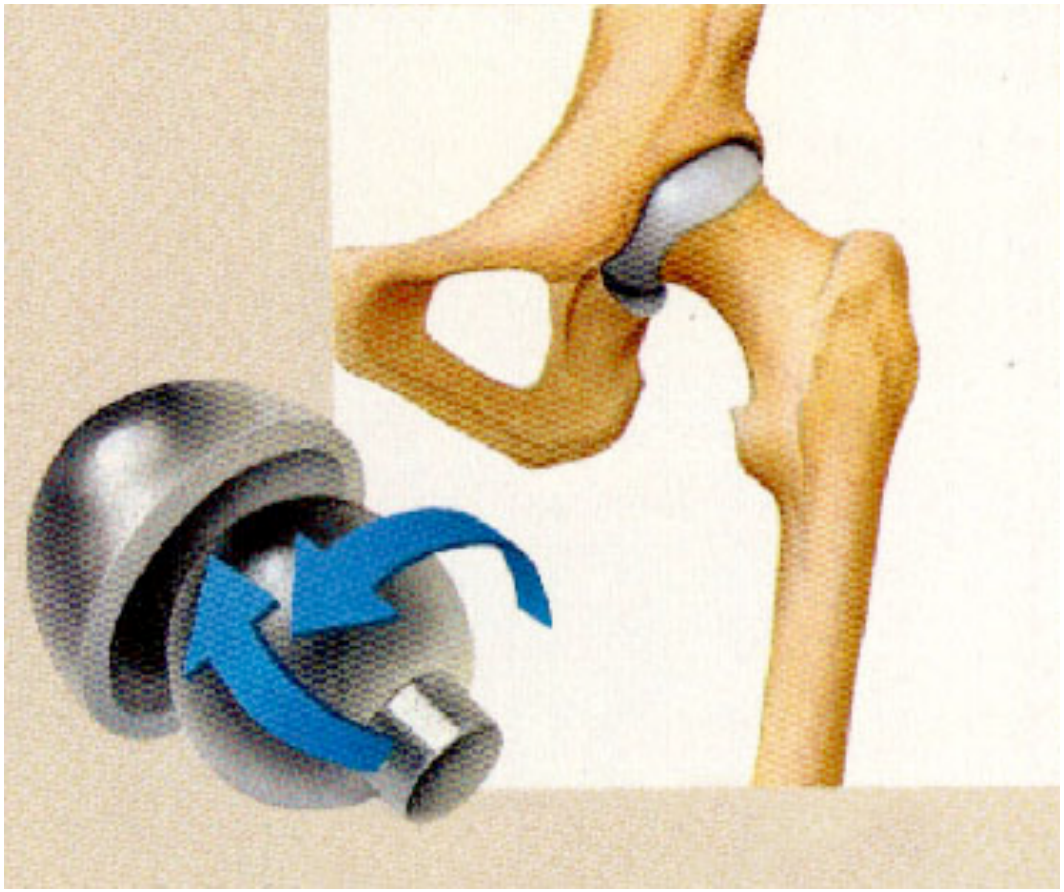
A saddle joint allows movement back and forth and up and down, but does not allow for rotation like a ball and socket joint.



Synovial Joints

Ball and Socket

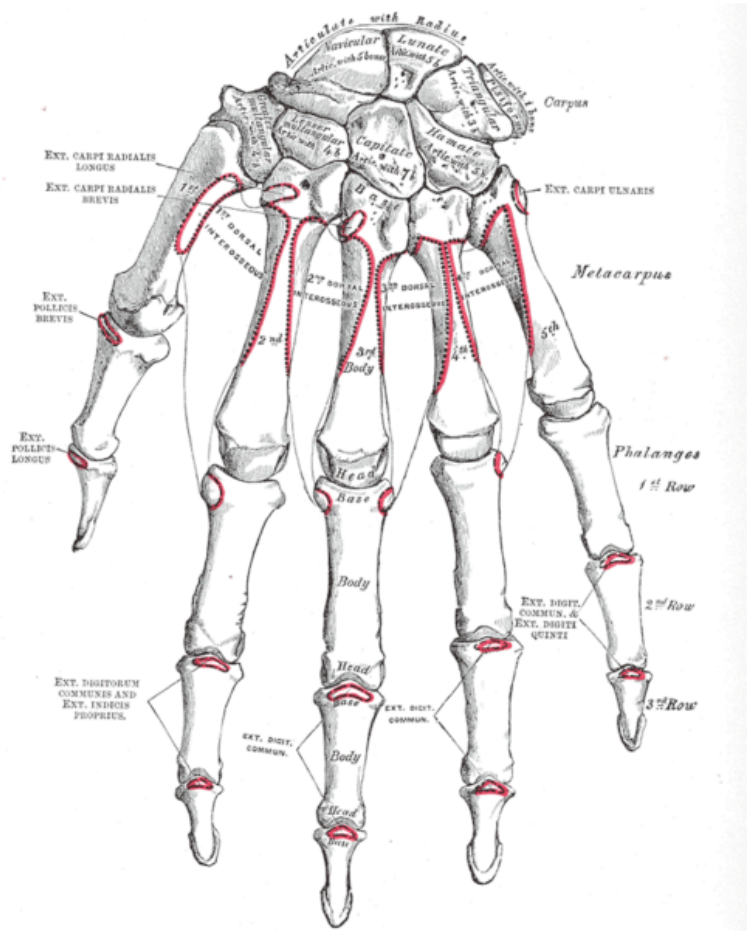
A ball and socket joint allows for radial movement in almost any direction. They are found in the hips and shoulders.



Synovial Joints

Ellipsoid

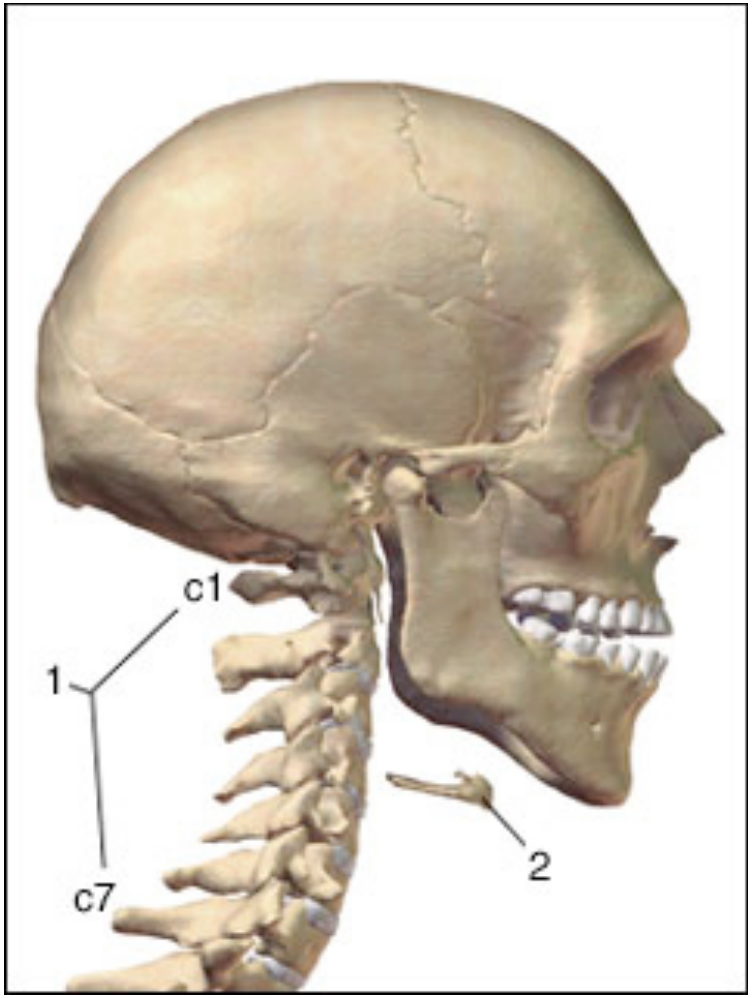
Ellipsoid joints are similar to a ball and socket joint. They allow for same type of movement to a lesser magnitude. The wrist is an ellipsoid joint.



Synovial Joints

Pivot

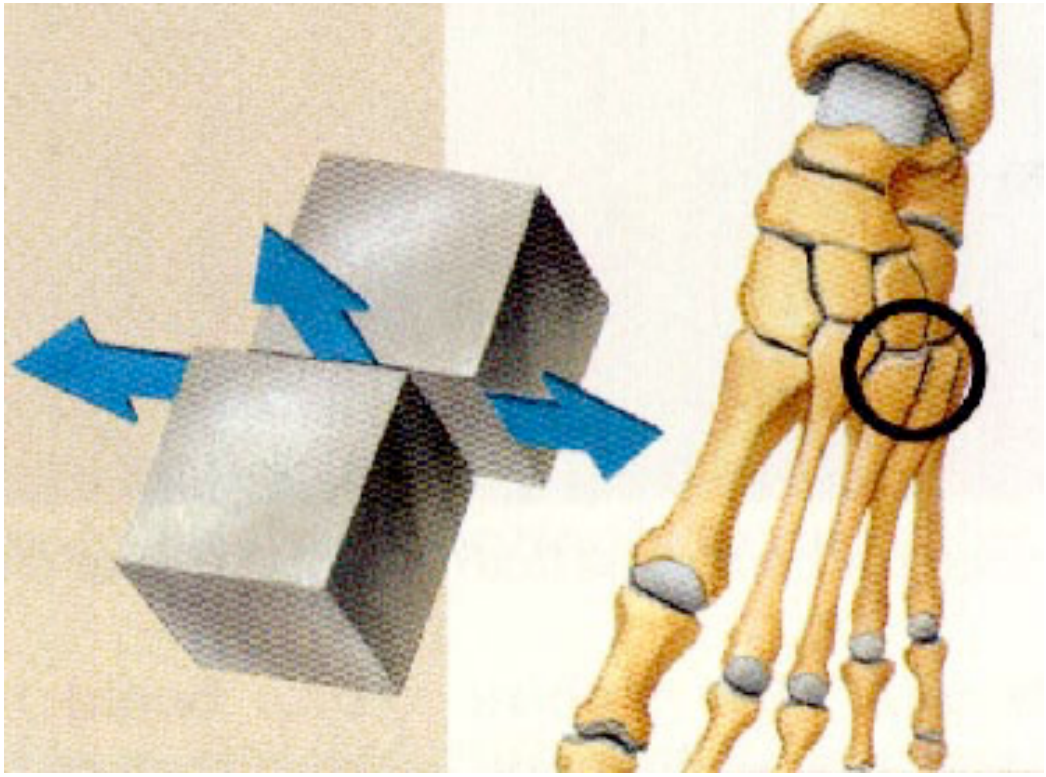
Pivot joints allow rotation around an axis. The neck and forearms have pivot joints. In the neck the occipital bone spins over the top of the axis. In the forearms the radius and ulna twist around each other.



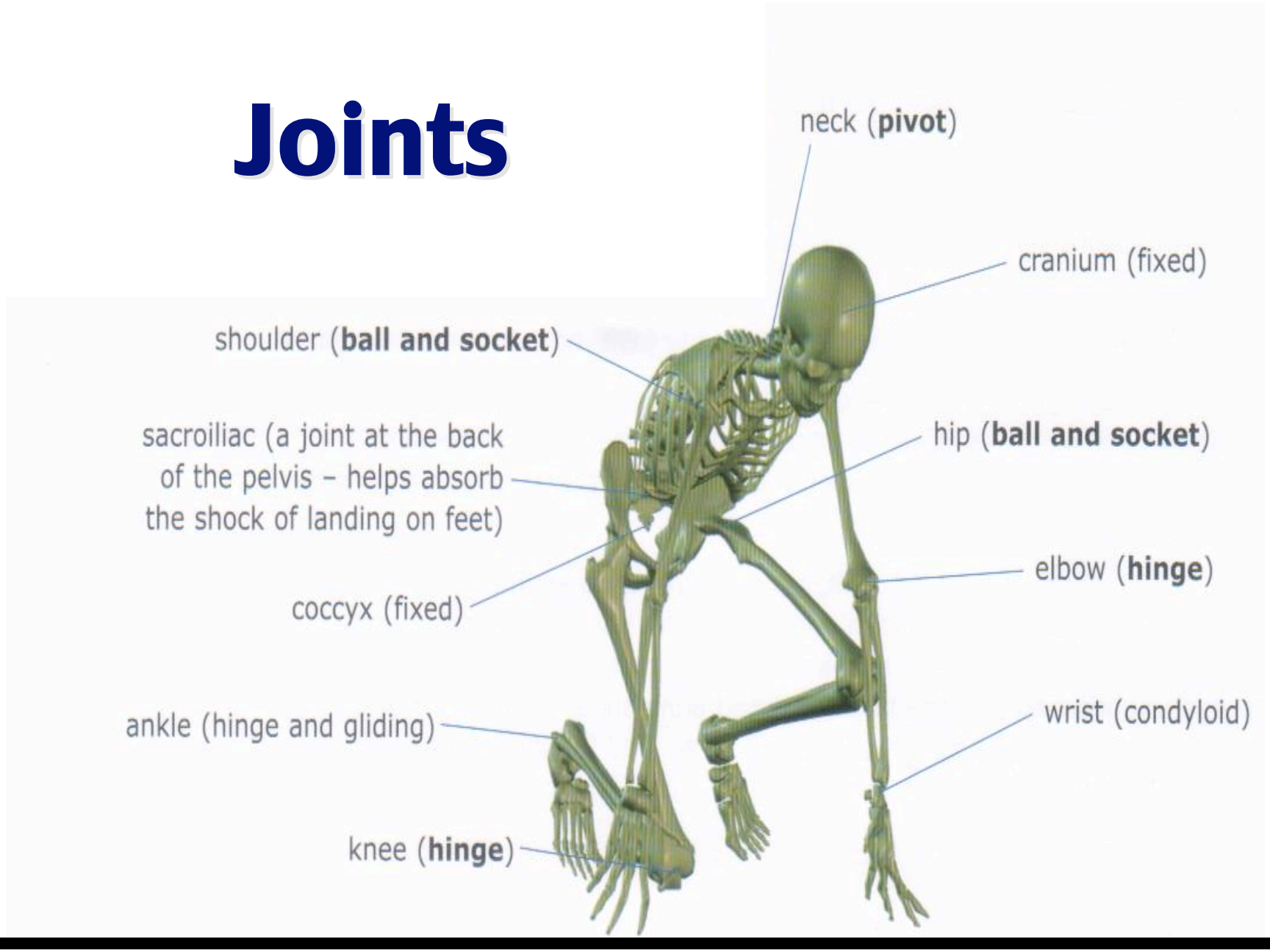
Synovial Joints

Gliding

In a gliding or plane joint bones slide past each other. Madcarpal and midtarsal joints are gliding joints.



Joints


neck (**pivot**)
cranium (fixed)
shoulder (**ball and socket**)
sacroiliac (a joint at the back of the pelvis – helps absorb the shock of landing on feet)
hip (**ball and socket**)
coccyx (fixed)
elbow (**hinge**)
ankle (hinge and gliding)
wrist (condyloid)
knee (**hinge**)