

Skeletal System Back and Lower Limb

The **vertebral column** includes; 7 neck vertebra called cervical vertebra, 12 chest vertebra called thoracic vertebra, 5 lower back vertebra called lumbar vertebra, the sacrum (which makes up the back side of the pelvis) and the tail bone or coccyx.

The vertebral column is made up of 26 irregular bones. It is attached on top to the skull, which it holds up and to the pelvis on the bottom, where it is anchored to the lower limbs. It surrounds and protects the spinal cord inside it. It anchors the **ribcage** and the strong muscles of the back that hold the body upright. Each vertebra is separated by a cushion-like disc that helps pad the moving backbones as we move. The vertebral column is about 28 inches long in an average adult. It has an S-shape that helps it be strong and flexible.

The **lower limb** includes the **femur** (thigh), the **tibia** (shinbone) and **fibula** (leg), and the bones of the **foot: tarsals** (ankle), **metatarsals** (foot) and **phalanges** (toes). The **knecap** (patella) sits in front of the knee joint, inside a muscle tendon. The femur is the largest bone in the body and makes up about 1/4th of a person's height. It forms a ball and socket joint at the hip with the pelvis and a hinge joint at the knee with the tibia.

The **hip joint** is very important for leg movement and is supported by strong muscles and ligaments. Though it is a ball and socket joint like the shoulder, it is more stable and less moveable than that joint. The **knee**, a **hinge joint**, has less flexibility than the hip but is more stable. However, because the knee carries the bulk of the body's weight, it is often injured. The entire weight of the body sits on the foot. The foot acts as a lever to move the body forward when we walk or run.

The **pelvis**, or **pelvic girdle** is formed by 2 hip bones (coxal bones). They come together in front and in back, they attach to the sacrum of the backbone. Each **coxal bone** is actually made up of 3 fused bones (**ilium, ischium and pubis**). On the outside of each coxal bone is a deep socket, called the **acetabulum**, where the head the leg bones (the femur) sits.

The pelvis supports and protects internal organs, attaches the lower limb to the body and with the lower limb supports the weight of the whole upper body. The hip joint is very important for leg movement and is supported by strong muscles and ligaments. Though it is a ball and socket joint like the shoulder, it is more stable and less moveable than that joint.

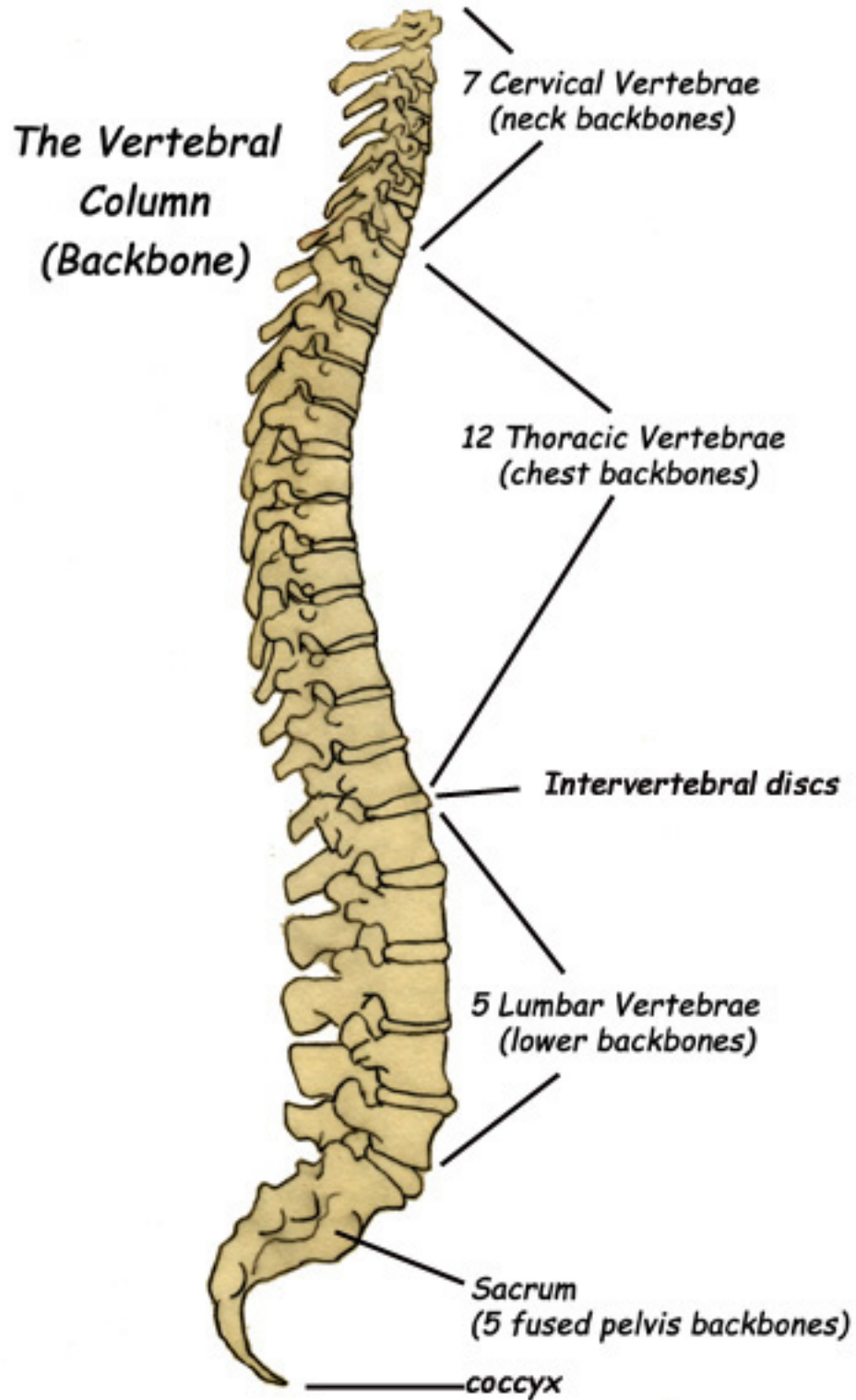
The **femur** is the largest and strongest bone in the body. It is a long bone making up about one fourth of your height and is the attachment point for some powerful muscles. At the hip (proximally), the femur's ball-shaped head joins (articulates) with the pelvis in the acetabulum and is secured by a strong ligament (**ligamentum teres**) attached to the **fovea capitis** on the head. The head attaches out (laterally) to a short neck that then attaches to the vertical shaft of the femur. Because of the way the head of the femur attaches to the side of the shaft, the neck is the weakest point and most prone to a break. Where the neck meets the shaft of the femur you will find the **greater trochanter** on the outside (lateral) and the **medial trochanter** on the inside (medial) which are

connected by the **intertrochanteric line** in front (anteriorly) and the **intertrochanteric crest** in the back (posteriorly). The **trochanters** are attachment points for the powerful muscles of the thigh and butt. More muscle attachment sites are found on the back side of the femur (posteriorly) – the **gluteal tuberosity** which leads down the shaft to the ridge-like **linea aspera**. At the bottom (distally), the femur spreads into a wide base with the medial and **lateral condyles** joining (articulating) with the **tibia**. Between the condyles is the **intercondylar notch**. Outside of them are the **lateral and medial epicondyles**, which are attachment sites for more muscles. The patellar surface in the front (anteriorly) joins (articulates) with the kneecap (**patella**).

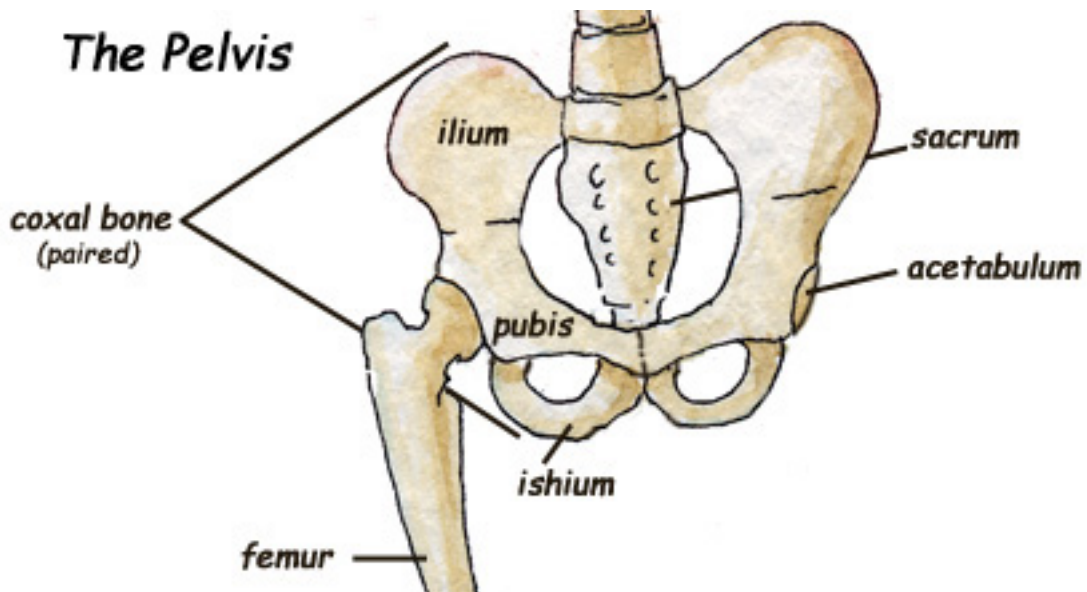
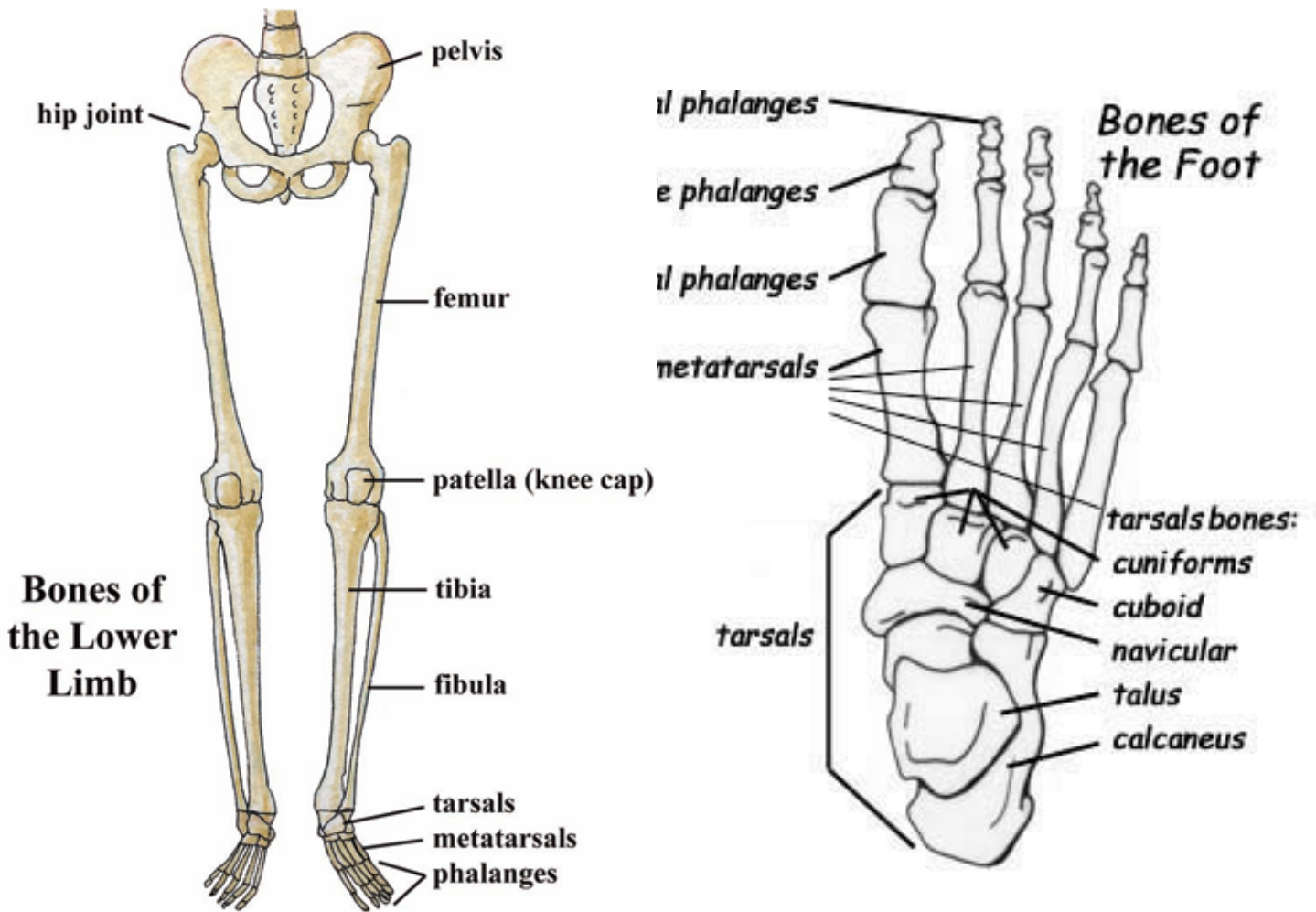
The bones of the foot include: **tarsals** (ankle), **metatarsals** (foot) and **phalanges** (toes). There are 7 **tarsal bones**, 5 **metatarsals** and 14 **phalanges**. All the toes have 3 **phalanges** except the big toe (hallux), which has 2.

The entire weight of the body sits on the foot. The foot acts as a lever to move the body forward when we walk or run. Tendons in the foot keep it stable and connect it to the strong muscles of the legs for movement.

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The Bony Features of the Femur

