

Bones, Muscles, and Joints

PART 3

What Are the Joints and What Do They Do?

Joints allow our bodies to move in many ways. Some joints open and close like a hinge (such as knees and elbows), whereas others allow for more complicated movement — a shoulder or hip joint, for example, allows for backward, forward, sideways, and rotating movement.

Joints are classified by their range of movement. **Immovable**, or **fibrous**, joints don't move. The dome of the skull, for example, is made of bony plates, which must be immovable to protect the brain. Between the edges of these plates are links, or joints, of fibrous tissue. Fibrous joints also hold the teeth in the jawbone.

Partially movable, or **cartilaginous** (pronounced: kar-tuh-**lah**-juh-nus), joints move a little. They are linked by cartilage, as in the spine. Each of the vertebrae in the spine moves in relation to the one above and below it, and together these movements give the spine its flexibility.

Freely movable, or **synovial** (pronounced: sih-**no**-vee-ul), joints move in many directions. The main joints of the body — found at the hip, shoulders, elbows, knees, wrists, and ankles — are freely movable. They are filled with synovial fluid, which acts as a lubricant to help the joints move easily. There are three kinds of freely movable joints that play a big part in voluntary movement:

Hinge joints allow movement in one direction, as seen in the knees and elbows.

Pivot joints allow a rotating or twisting motion, like that of the head moving from side to side.

Ball-and-socket joints allow the greatest freedom of movement. The hips and shoulders have this type of joint, in which the round end of a long bone fits into the hollow of another bone.

Things That Can Go Wrong With the Bones, Muscles, and Joints

As strong as bones are, they can break. Muscles can weaken, and joints (as well as tendons, ligaments, and cartilage) can be damaged by injury or disease. The following are problems that can affect the bones, muscles, and joints in teens:

Arthritis. Arthritis is the inflammation of a joint, and people who have it experience swelling, warmth, pain, and often have trouble moving. Although we often think of arthritis as a condition that affects only older people, arthritis can also occur in children and teens. Health problems that involve arthritis in kids and teens include juvenile idiopathic arthritis (JIA, also known as juvenile rheumatoid arthritis, or JRA), lupus, Lyme disease, and septic arthritis (a bacterial infection of a joint).

Fracture. A fracture occurs when a bone breaks; it may crack, snap, or shatter. After a bone fracture, new bone cells fill the gap and repair the break. Applying a strong plaster cast, which keeps the bone in the correct position until it heals, is the usual treatment. If the fracture is complicated, metal pins and plates can be placed to better stabilize the fracture while the bone heals.

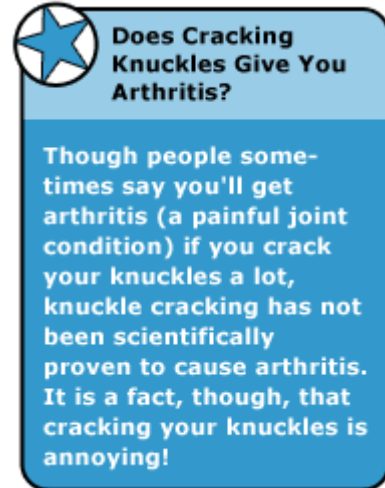
Muscular dystrophy. Muscular dystrophy (pronounced: **dis**-truh-fee) is an inherited group of diseases that affect the muscles, causing them to weaken and break down over time. The most common form in childhood is called Duchenne muscular dystrophy, and it most often affects boys.

Osgood-Schlatter disease (OSD). Osgood-Schlatter disease is an inflammation (pain and swelling) of the bone, cartilage, and/or tendon at the top of the shinbone, where the tendon from the kneecap attaches. OSD usually strikes active teens around the beginning of their growth spurts, the approximately 2-year period during which they grow most rapidly.

Osteomyelitis. Osteomyelitis (pronounced: os-tee-oh-my-uh-**lie**-tus) is a bone infection that is often caused by *Staphylococcus aureus* (pronounced: sta-fuh-low-**kah**-kus **are**-ee-us) bacteria, though other types of bacteria can cause it, too. In kids and teens, osteomyelitis usually affects the long bones of the arms and legs. Osteomyelitis often develops after an injury or trauma.

Osteoporosis. In osteoporosis (pronounced: ahs-tee-o-puh-**row**-sus), bone tissue becomes brittle, thin, and spongy. Bones break easily, and the spine sometimes begins to crumble and collapse. Although the condition usually affects older people, girls with female athlete triad syndrome and teens with eating disorders can get the condition. Exercising regularly and getting plenty of calcium when you're a kid and teen can prevent or delay you from getting osteoporosis later in life.

Repetitive stress injuries (RSIs). RSIs are a group of injuries that happen when too much stress is placed on a part of the body, resulting in inflammation (pain and swelling), muscle strain, or tissue damage. This stress generally occurs from repeating the same movements over and over again. Playing sports like tennis that involve repetitive motions can also lead to RSIs. Kids and teens who



spend a lot of time playing musical instruments or video games are also at risk for RSIs. RSIs are becoming more common in kids and teens because they spend more time than ever using computers.

Scoliosis. Every person's spine curves a little bit; a certain amount of curvature is necessary for people to move and walk properly. But three to five people out of 1,000 have a condition called scoliosis (pronounced: sko-lee-**o**-sus), which causes the spine to curve too much. The condition can be hereditary, so a person who has scoliosis often has family members who have it.

Strains and sprains. Strains occur when a muscle or tendon is overstretched. Sprains are an overstretching or a partial tear of the ligaments. Strains usually happen when a person takes part in a strenuous activity when the muscles haven't properly warmed up or the muscle is not used to the activity (such as a new sport or playing a familiar sport after a long break). Sprains, on the other hand, are usually the result of an injury, such as twisting an ankle or knee. Both strains and sprains are common in teens because they're active and still growing.

Tendonitis. Tendonitis (pronounced: ten-duh-**ny**-tus) is a common sports injury that usually happens after overusing a muscle. The tendon and tendon sheath become inflamed, which can be painful. Resting the muscles and taking anti-inflammatory medication can help to relieve this condition.

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