

# Knees

## **Knee Integrity**

Recently we've developed a much greater understanding about what causes knee dysfunction. Of course, we've had knowledge about torn knee cartilages, torn ligaments, arthritis, and loose bodies in the knee for a long time. The newer knowledge explains why many of these conditions, observed for such a long period of time, develop— even torn cartilages and torn ligaments. Certainly a torn ligament or cartilage can be a direct, primary development, caused by being tackled in football or other direct injury. More commonly, these injuries develop when the football player is running and suddenly cuts, or when a person is simply getting up from a stooped position. In other words, the problem develops during an activity similar to that done on a day-to-day basis without injury. Suddenly, for some reason, an injury develops from the same activity.

The knee is generally considered a simple hinge-type joint which is moved through its range of motion by the muscles attached to it, primarily giving movement to straighten or bend the leg. The joint contains two pads, called the semilunar cartilages. Sometimes these cartilages can be torn, and require surgery. Surgery is also sometimes necessary to remove loose bodies from the inside of the joint, and to tie torn ligaments back together.

The muscles were once considered simply the motors that move the bones of this joint. The muscles also give stabilization to the joint along with the ligaments which limit the joint's range of motion. Many knee problems are the direct result of improper support given to the knee joint or the muscles which attach above and below it. The illustration shows how the muscles give support to the knee on both the middle and the outside of the structure, as well as the front and back.

If one or a group of these muscles becomes weak, the knee loses its stability in that direction. In other words, if the muscle(s) on the middle side of the knee is weak, there is little to keep the knee from bending toward the center. If this condition is present and an individual strains his knee in that direction, there isn't much to keep the knee from jamming in that direction. This can cause something as simple as a "trick knee" or something much more serious, such as catching of the cartilage as the knee goes through its range of motion which causes a tear to occur.

By testing the individual muscles which support the knee, a chiropractor can find the area of limited strength. Further evaluation of the weakened muscle gives the

doctor information to effect a strengthening of the muscle. Usually, the cause of the problem is rapidly found and removed, causing an immediate strengthening of the muscle(s) at fault.

## **Total Body Structural Balance**

The knee is often involved on a secondary basis. We sometimes tend to think of the body as segmental functioning units; however, this is not the way the body works. The body's structural balance must be in complete harmony for it to work as a total, integrated whole. When the knee is examined by a doctor, it must be examined with this wholistic concept in order to avoid treating effects rather than primary causes.

**Foot-Ankle.** The foot and ankle, when functioning improperly, cause a strain throughout the body. The knee is one of the primary areas that receives strain from the foot. You can observe this by standing and making your foot go into a flat-foot position; watch your knee roll inward. If a person has a pronated or flat foot, his knee is accepting shock with every step. This is strictly a mechanical strain to the leg, which includes the knee. Within the foot there are nerve endings, called proprioceptors, which transmit information up to the muscles of the leg and the rest of the body as a person walks. If the foot is not functioning normally, there is a great chance these nerve messages will go up to the body in a confused manner, causing poorly integrated muscle action. If the muscles receiving improper messages are knee-supporting muscles, it only follows that there will be poor knee support.

**Pelvic Balance.** The bones of the pelvis and lower back and their associated muscles contribute greatly to balance in the knee. If the pelvis and its associated structure are off-balance, a structural strain will develop in the knee similar to that from improper foot action.

**Reactive Muscles.** All muscles have proprioceptors, which are nerve endings that sense activity of the muscles. This sensory information goes to other muscles which work in harmony with, or opposite to, the muscle sending the information. This information exchange between muscles is absolutely essential for coordinated, harmonious action. An example of the activities of these nerve endings and of the communication between muscles is when one muscle contracts, the muscle working in the opposite direction must relax. This intra-activity is developed through the proprioceptive mechanism. Sometimes, because of injury, the proprioceptors send improper, disorganized information. The information

may cause a muscle to relax at a time when it is most needed for support. A football player may be running and suddenly cut to the side to avoid an opponent. If a proprioceptor is incorrectly stimulated during the act of cutting, this erroneously causes the medial muscles of the knee to weaken, allowing the knee to bend toward the middle, thus jamming the outside cartilage and possibly causing a tear. The same thing could happen during the innocent activity of raising up from a kneeling position in your living room.

In this example of reactive muscle involvement, the muscles supporting the knee will all test normally during your chiropractic initial examination. The doctor will then elicit information about the proprioceptive system by first testing one muscle, thus activating it, and quickly testing another muscle to determine the effect on the secondary muscle. If the reactive muscle phenomenon is present, the second muscle will be dramatically weaker immediately after testing the first, or primary, muscle. Treatment is thus directed toward the primary muscle, after which the secondary muscle no longer weakens – even though the first muscle is stimulated just prior to testing.

**Arthritis.** The most common kind of arthritis in the knee is osteoarthritis, known as the “wear and tear” type of arthritis. It is considered common in the knee because the knee is such a major weight-bearing structure. This is true, but it doesn’t go far enough; there is more to the story. The knee, being a major weight-bearing structure of the body, requires excellent structural stability to avoid excessive strain. The knees of the individual with poor support receive considerably more wear and tear than is normal. This additional strain causes much more rapid development of osteoarthritis – especially if the individual is prone to osteoarthritis anyway.

**Bursitis.** Bursitis is an inflammatory reaction in the bursa of a joint (the lubricating membrane). Here again, excessive strain increases the potential for development of bursitis.

**Gait Mechanism.** Correlated with the proprioceptive mechanism and reactive muscles outlined above is evaluation of the muscles as they operate in a normal walking and running gait. Sometimes muscles seem normal when tested individually; when certain gait muscles are tested simultaneously, they become weak. This causes an abnormal walking and running pattern, which can contribute to dysfunction of any of the joints or structures used by the mechanisms of normal gait patterns.

Whenever a knee is involved, even if it appears that there has been a direct injury, the Doctor of Chiropractic must perform considerable amount of detective work to be sure the primary problem is being treated. As you have read, the knee injury can be the result of a foot, pelvic, supporting muscle, or gait problem. If the primary

involvement is not treated, it remains as a hidden cause to effect a knee injury in the future. This happens to individuals who are often considered to have “weak knees”. They will usually, eventually, develop a torn ligament or cartilage, necessitating surgery.

As always, effective treatment depends upon finding the basic underlying cause, and directing treatment in that direction.