

As I mentioned earlier, all joint surfaces are covered with hyaline cartilage. This wonderful material provides a near frictionless surface for the joint to flex over (*articulate*).

Because it has the consistency of tire rubber, it also acts as a shock absorber. It is made of living cells called chondrocytes that are scattered through a fibrous protein matrix of collagen and materials called proteoglycans, which are combined molecules of protein and carbohydrate.

Only the cellular (*chondrocyte*) portion of your pet's cartilage is actually alive. And that forms only 1% of the mass of the cartilage. Collagen and proteoglycans, water and smaller proteins form the rest.

These same materials form the joint capsule of ligaments and fascia that stabilize your pet's joints. Within the joint, a cushioning thick liquid called synovial fluid separates the bones. This fluid is produced by a thin layer of cells that coat all joint and inner joint capsule surfaces. It is called the synovial membrane. The amount of synovial fluid in a healthy joint is very small (*only about a twentieth of a millimeter thick*) .

Besides lowering friction; this fluid nourishes the chondrocytes that form the joint's cartilage. Cartilage, in itself, has very little blood supply. Even healthy joint surfaces are not perfectly smooth. The thick synovial fluid fills the small dips and nooks in the surface allowing for more perfect motion.

Collagen exists in fibers (*fibrils*) there are many different types within the cartilage of every joint. The strongest and most common type are cross-banded.

The proteoglycan portion gives the cartilage toughness and resilience. Their central core is protein. To that are attached, at right angles, carbohydrates (*polysaccharides = sugar*) known as glycosaminoglycans. There are many different ones, most containing sulphate.

If that still isn't enough information, read more about the microscopic structure of normal cartilage at [wikibooks](#) and the arthritic processes that destroy it at the microscopic level [here](#).

When joints begin to fail, it appears to be because chondrocytes in peripheral areas of the joint have become starved for nutrients (*chondromalacia*), depleted in sulfated mucopolysaccharides and no longer able to repair (*remodel*) normally. When this damage occurs, inflammatory chemicals ([prostaglandins & cytokines](#)) they secrete cause the bone surround the joint to proliferates abnormally.