

# Understanding Our Joints and Their Injuries

By Robin Weiss Director of Fitness

Sprains, fractures, and arthritic conditions are some of the many common injuries that our joints are susceptible to. Quick direction changes, rapid swinging motions, repetitive movements, and running on uneven surfaces are common activities that put our joints at a higher risk for injuries.

A synovial joint is the most common and most movable type of joint in our body. Like most of our joints, synovial joints achieve movement at the contact point of the articulating bones. But, it is also at this point that structural and functional differences distinguish our synovial joints from our cartilaginous and fibrous joints. The main structural difference between our synovial and fibrous joints is the existence of membranes (aka. synovial capsules or cavities) surrounding the articulating surfaces of our synovial joints; along with the presence of lubricating synovial fluid within these membranes.

Looking at the ankle joint, we see that it consists of the distal end of the tibia and fibula and the proximal end of the talus. Several strong, fibrous ligaments and tendons hold these bones together. The ends of the bones are protected by cartilage and the space in the joint is protected and cushioned by a synovial membrane. Thus, the ankle is a synovial joint.

We have six types of synovial joints. Some are relatively immobile, but are quite stable. Others have varying degrees of freedom, which comes at the expense of greater risk of injury. In ascending order of mobility, some of our synovial joints are: elbows, knees, wrists, shoulders, and hips.

Synovial membranes, and the fluid they contain, help cushion our joints from the large forces we place on them from things like the impact of walking, running, and jumping. The fluid also lubricates our joints to allow for movement. These tissues (collectively known as the synovium), like any tissues, can become inflamed and irritated.

## **Synovitis**

Synovitis is an injury to the synovial membrane of a synovial joint that results in inflammation of the synovium causing pain and swelling. The inflammation can cause excess fluid to leak into the joint, which can result in a blockage of nutrients to the surrounding surfaces, a degradation of the cartilage, and instability in the joint. The inflammation can also cause the membrane to swell, thus placing extra pressure on the surfaces of the joint.

Again using our ankle as an example, we see that the ankle joint is surrounded by a synovial membrane that cushions and protects the bone ends that articulate the ankle joint. This membrane provides cushion and lubrication for the joint. Although the ends of the bones involved, the tibia, fibula, and talus, are covered with cartilage, the synovial membrane cushions the open space, keeping the bone ends separated just enough to allow movement. The synovial fluid also provides lubrication to the joint, which further protects the bones and reduces friction.

If the synovial membrane surrounding the ankle joint becomes inflamed, it can cause an increase in the fluid inside the cavity, or cause swelling that increases pressure on the structures of the joint. This can then cause an uneven or excessive wear to the cartilage at the end of the bones.

## **Causes**

Synovitis can be caused by prior injuries to a joint, such as sprains or fractures. These injuries can result in acute damage directly to the synovial membrane. They can also cause an imbalance or misalignment of the bones that leads to a chronic condition that irritates the synovium. Other causes of synovitis can be a bacterial or viral infection in the area, rheumatoid arthritis or gout, and reduced strength or muscular imbalances that cause an injury to the synovial membrane.

## **Signs and Symptoms**

Synovitis can be accompanied by pain and heat in the joint. The pain from this condition can range from mild aching to a sharp burning pain. Swelling and inflammation deep in the joint, that may or may not be visible on the exterior of the joint, can also be associated with synovitis. When excess fluid is released into the joint, or severe swelling occurs within the synovium, tightness may be felt in the joint itself. This reduces range of motion. The reduced range of motion and loss of function that occurs with synovitis depends on the degree of pain and inflammation involved.

## **Treatment**

The initial treatment recommended by your doctor will probably be rest, ice and NSAIDs to help reduce the inflammation and stress on the synovial membrane. Heat is often used later to improve function and reduce stiffness in the joint. Corticosteroid injections may be necessary if the injury is severe.

Correcting the condition that caused the inflammation is necessary to prevent it from recurring. This usually requires intervention by a physical therapist or sports medicine professional. But, a certified personal trainer can assist you with follow-up work. For some joint injuries, orthotic devices can help correct imbalances and structural issues. For example, orthotics to correct structural issues in the foot can help prevent ankle synovitis from recurring.

By properly addressing the inflammation and correcting the causal condition, synovitis will usually respond to treatment in 3 to 5 weeks.

## **Prevention**

Prevention of synovitis itself can be difficult due to the secondary nature of the injury. However, if we avoid the injuries or disease processes that can lead to synovitis, we can help reduce the likelihood of developing this condition. Here are some tips:

- A proper warm up will help prepare our muscles and joints for any activity they might be called upon to complete by reducing the effects of existing muscle imbalances and preparing our muscles to support and protect our joints during activity.
- Avoid activities that cause pain. Do not try to push through the pain hoping it will just go away. Pain is a signal from our body that something is not right. We must listen to it and avoid painful activities until they are pain free.
- Good flexibility and strength will help reduce most joint injuries. Improving flexibility allows our joints to go through larger ranges of motion without incurring injuries. Flexible muscles are also better able to contract, thus protecting our joints in extended ranges. Increasing overall strength helps provide a protective support system for our bones and joints by strengthening both muscles and tendons.

References: TheStretchingHandbookcom 2009; En.wikipedia.org 2009