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ARTHRITIS

Arthritis is a leading disability in the United States, some say the leading disability disease. There is no medical cure. Over 600,000 knee replacements are being performed each year. This number is expected to rise to over 3 million by 2030.

Joint problems are not fatal so they garner little media attention and relatively few research dollars. In spite of this, arthritic disorders are one of the most common medical issues most physicians deal with.

The word arthritis literally means “inflamed joints” from arthron (joint) and itis (inflammation). There are about 100 different forms of the disease. The two most common are osteoarthritis, and rheumatoid arthritis. Osteoarthritis is 30-50 times more common than rheumatoid arthritis and is the topic of this paper.

Osteoarthritis is also known as degenerative joint disease. The disease is characterized by the deterioration and breakdown of cartilage. The result is aching and painful joints. Osteoarthritis can affect the spine, hip, knees, neck, hands and feet. By the time an individual experiences pain considerable damage has already taken place.

One common sign of advanced osteoarthritis is Heberden’s node. These are bony lumps which form on the outermost finger joints. Bony lumps called Bouchard’s nodes can form on

the middle finger joints. Crepitus or creaky joints can also develop.

More than 80% of people older than 55 will develop osteoarthritis. Well over one million hip replacements, low back operations, and knee replacements are performed each year. Most of these operations are due to osteoarthritis and the number is only expected to grow as the population ages.

Osteoarthritis has long been classified as noninflammatory arthritis. This is an unfortunate result of early observations. It is now recognized that not only is inflammation present, but that a state of low-grade, chronic inflammation of the joint drives the progression of osteoarthritis, Inflammation of the synovial tissue precedes structural damage to the joint.

Sokolove and associates write, “These studies, demonstrating significant synovial inflammation in early OA (osteoarthritis), suggest a window of opportunity may exist in which disease-modifying interventions targeting inflammatory processes might be most efficacious for the prevention

and treatment of OA.”

Nonsteroidal Anti-inflammatory Drugs or NSAIDS are commonly used to treat the pain associated with osteoarthritis. Unfortunately, some of these drugs can damage joint cartilage and inhibit joint repair processes. Nutritional anti-inflammatories should not have this drawback.

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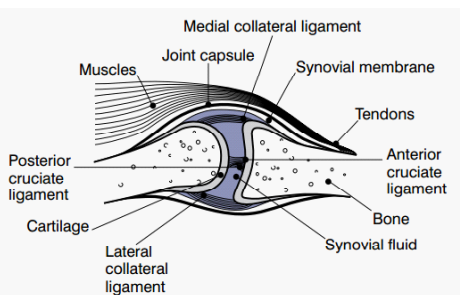
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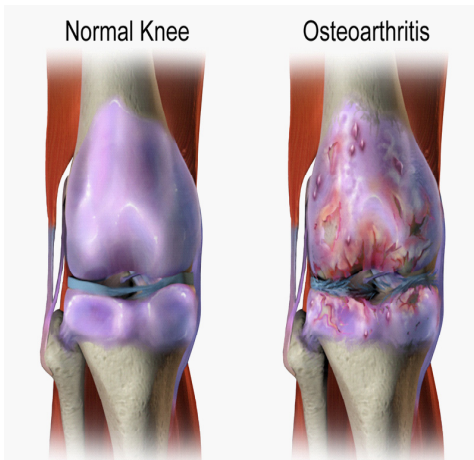
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STRUCTURE

The synovial joints are the most common of the three types of joints in the human body. These most often create problems as is often seen with the hip and knee joints.

The ends of these joints are cush-





ioned with a smooth elastic tissue called cartilage. The space inside the joint is filled with lubricating fluid called synovial fluid. The entire joint is encased in a protective bag and surrounded by bands of fibrous tissue called ligaments that prevent the joint from stretching too far.

Bone nourishes cartilage through microscopic channels. Unhealthy bone can not produce healthy cartilage. Cartilage is a plastic-like tissue made of thick bundles of collagen. It also contains water, cells called chondrocytes, and proteoglycans.

Collagen is the most abundant protein in the human body. This major structural protein requires sulfur containing amino acids, vitamin C, iron, copper, and manganese for its manufacture. Vitamin C is so important for collagen that lack will result in scurvy.

Sugars are also essential for the production of healthy cartilage. Proteoglycans are sugar-protein combinations with the consistency of runny jello. They are manufactured from several molecules including hyaluronan and chondroitin sulfate but the most important by far is glucosamine.

The high sulfur content of proteoglycans allows them to absorb water like a dry sponge. When pressure is applied to the joint the water is released and when the pressure is released the water is reabsorbed. In this way the cartilage in the joint can function like the shock absorb-

ers in a car distributing pressure and preventing damage to the bones.

NUTRIENTS

Glucosamine

Glucosamine deserves first mention when discussing joint health and joint repair. It is the central structural material for building joints.

Bucci wrote, "Glucosamine is what is known as a rate limiting step. This means that chondrocytes determine whether or not they can make more cartilage by how much glucosamine is around."

Glucosamine is a key nutrient to consider for prevention of osteoarthritis. Bucci writes, "...there is good evidence that extra glucosamine can flip a switch and convince chondrocytes to stop destroying cartilage and even rebuild it."

Glucosamine can be supplied as a sulfate or a hydrochloride. The following quote explains why NeoLife has chosen the hydrochloride form: "Glucosamine sulfate requires compound stabilizers in the form of salts and has 74% purity. Glucosamine HCl lacks the sulfate group and has 99% purity. Therefore, glucosamine HCl in a dosage of 1,500 mg equals a dosage of 2,608 mg of glucosamine sulfate."

Deficiency of sulfur containing amino acids can impair production of glucosamine. Adequate quantities of methionine and cysteine are particularly important.

Vitamin C

Second in importance for the joints is vitamin C. Way back in the 1980's Schwartz noted that guinea pigs, like humans, do not synthesize their own vitamin C. Diets low in vitamin C lead to every indication of advanced osteoarthritis. The amount of vitamin C adequate to prevent scurvy in guinea pigs is substantial compared to the recommended intake for humans by government agencies.

Osteoarthritis often begins with

injury to a joint. Similar injuries have been induced in guinea pigs by Schwartz and associates. They summarized their results as follows: "Regardless of the surgical procedure used, animals on minimal levels of ascorbate always exhibited more severe pathology than those on high levels."

These researchers observed a greater cartilage weight in guinea pigs on high levels of vitamin C intake. They wrote, "It is likely that this stimulated synthesis of cartilage in the supplemented animals protected against the erosion of the articular cartilage which characterized the more severe disease process in the guinea pigs on minimal levels of ascorbate."

Niacinamide

Dr. William Kaufman's book *The Common Form of Joint Dysfunction* is a nutrition classic. Kaufman noted that when fortification of white flour with vitamin B3 began severe symptoms of pellagra usually disappeared, but some of the symptoms seemed to linger in some of his patients including lack of joint mobility, impaired balance, and muscular weakness.

Kaufman began giving his patients divided doses of the vitamin and noted huge improvement in 70% of his patients with these symptoms. There was often rapid improvement in the first month followed by a gradual improvement of joint mobility for several years. Discontinuation of the vitamin resulted in the return of symptoms within weeks.

Kaufman gave niacinamide every 1-3 hours because he knew that this vitamin has a short half-





life in the body and high doses are simply spilled into the urine.

Dr. Abram Hoffer who used generous doses of niacinamide to treat alcoholism and schizophrenia was able to substantiate the work of Kaufman that vitamin B3 improved joints.

Vitamins D and K

These vitamins are essential for healthy bone. Since bone nourishes the joints it should not be surprising that deficiencies of these nutrients can play a role in osteoarthritis. The well-known Framingham study found that low intake and low blood levels of vitamin D were associated with an increased risk of progression of osteoarthritis of the knee.

Low blood levels of vitamin K have also been shown to be associated with increased appearance of osteoarthritis in the hands and knees. Low levels of this vitamin can result in abnormal cartilage and bone mineralization.

Boron

Newham became convinced of the essential nature of boron when it alleviated his arthritic pain and discomfort. He found evidence dating back to 1963 that boron was a safe and effective treatment for some forms of arthritis.

In one double-blind, placebo trial boron supplementation with 20 patients found that half improved with boron supplementation, while only 10% improved on placebo.

In areas of the world where boron intake is low 20-70% of the population often suffers with arthritis, while in areas where intake is high less than 10% of the population tends to suffer with arthritis.

The femur heads, bones, and synovial fluid of those with arthritis tend to have lower concentrations of boron than those without the condition. Boron is associated with stronger bones. Rats with experimentally induced arthritis benefit from boron supplementation.

Silicon

Silicon has been used to treat aluminum toxicity and widespread exposure to aluminum could contribute to deficiencies of this mineral. Research dating back to 1976 found skeletal and other abnormalities involving cartilage and connective tissue were associated with silicon deficiency.

Carlisle wrote, "These findings provide the first evidence for a requirement for silicon in articular cartilage and connective tissue formation and that the site of action of silicon is in the glycosaminoglycan-protein complexes of the ground substance."

Zinc

Zinc and copper are essential factors in collagen formation. Unfortunately, calcium supplementation can impair zinc absorption and contribute to the retention of copper contributing to an imbalance. Zinc supplementation can be important since this nutrient is commonly deficient in the diet of older individuals.

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ANTI-INFLAMMATORIES

As mentioned previously, recent research has shown that the inflammatory process is a major driver in the development of osteoarthritis. As a result, researchers have sought to find anti-inflammatory substances that do not impair joint repair processes. Three substances have been fairly well researched.

Boswellia

The resin of the Boswellia tree is commonly known as frankincense. This herbal substance from India has been used for centuries to treat various chronic inflammatory diseases. One of the acids in Boswellia is a potent inhibitor of an enzyme (5-lipoxygenase) responsible for inflammation.

A randomized, double-blind, placebo controlled trial found Boswellia both efficacious for pain relief and well tolerated when used to treat osteoarthritis. The researchers wrote, "BSE decreased the pain in the affected knee joints, decreased the swelling





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and improved the loss of function in terms of increased knee flexion, stairs climbing and walking distance.” The researchers went on to recommend Boswellia for other forms of arthritis.

Bromelain

Bromelain is an enzyme found in pineapple. It is used to reduce inflammation after surgery and injury. One paper wrote, “We conclude that bromelain may be effective in ameliorating physical symptoms and improving general well-being in otherwise healthy adults suffering from mild knee pain in a dose-dependant manner.”

White Willow

White willow contains a substance called salicin which is very similar to aspirin. The herb also contains powerful anti-inflammatory flavonoids. White willow has demonstrated pain-relieving properties and has been found to be well-tolerated by osteoarthritis patients.

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CONCLUSION

Joint tissues turn over slowly, and more so as we age. For this reason, use of beneficial nutrients to promote healing of the joints should be given some time. Joints deteriorate over a period of decades. One should allow several months to see if the nutrients discussed here can result in improvement.

Luke Bucci says it best. He wrote, “we know that cartilage does indeed repair itself, although very slowly. The hard part is stimulating cartilage to heal. To do so it needs an extra metabolic nudge.”

Hopefully the information in this newsletter will provide you with the information you need to provide cartilage with that extra nudge.

In the scientific literature one will see the term chondroprotection. This

is a scientific term that simply refers to repairing damaged cartilage and preventing its breakdown. Chondroprotective agents work like light switches that can turn on the cartilage repair process.

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