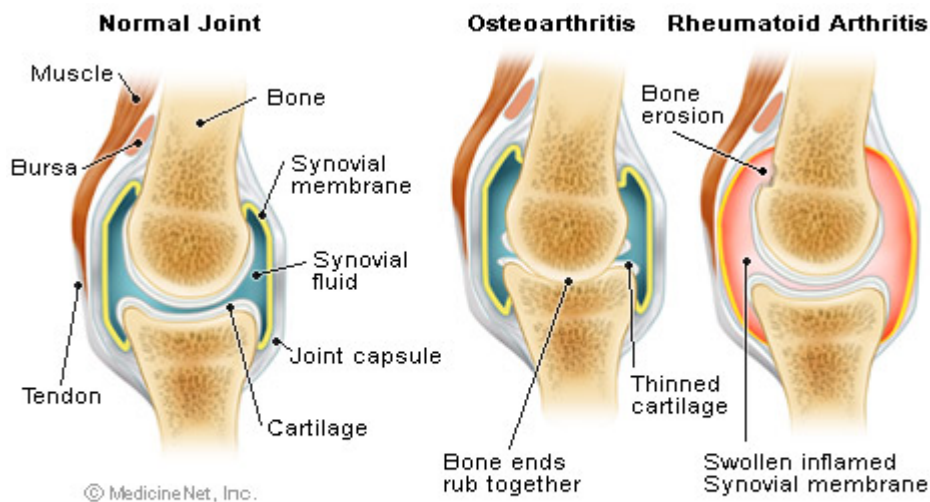


Conquering Osteoarthritis

By Tamara Mitchell



Osteoarthritis (OA) is not a repetitive strain injury, but it definitely compounds the problems of RSI and shares the symptoms of inflammation and pain. OA was once considered the result of "wear and tear" to the joints, however research now shows that heredity is also a factor.^{1,2} OA develops when your body progressively loses cartilage at the ends of bones in a joint or in the spine. Cartilage is spongy and filled with synovial fluid which lubricates the joints as they move. With OA, the water content of cartilage increases, the protein of the cartilage degenerates, and the cartilage starts to wear away, eventually causing bone to scrape against bone, triggering inflammation in the tissues surrounding the joints.^{1,2} Inflammation of the cartilage can stimulate new bone outgrowths or spurs called osteophytes.² Ligaments and tendons supporting the joints become loose and the surrounding muscles grow weak. Cracking, crunching, and creaking of the joint can occur.^{1,3} Using the joint causes aches, pain and stiffness that wasn't there in younger days.¹



Normal and Arthritic Joints

Illustration courtesy of MedicineNet.com²

Primary osteoarthritis is due to aging and hereditary factors. Secondary osteoarthritis is brought on by other factors including obesity, repeated trauma, surgery on the joint, abnormal joints at birth, gout, diabetes, or growth hormone disorders.² Obesity is the second most powerful risk factor for osteoarthritis of the knees with aging being the first risk factor.² Every extra pound you carry can have the impact of three pounds of pressure on your knees and hips as you move.¹ Over 50% of all the cases of OA of the knee and 25% of the cases of OA of the hip are linked to excess weight.¹

Gout and pseudogout are a buildup of crystals in the joints that cause inflammation. In a few cases, both types of crystals can occur in the joints.⁴ In the case of gout, the crystals are monosodium urate which form in some people who have too high a level of uric acid in the blood.⁵ In the case of pseudogout, the crystals are calcium pyrophosphate.⁴ Tests can determine the presence of gout or pseudogout and treatment involves dietary, lifestyle changes, and sometimes medication.^{4,5}

Damage to the joints can begin at the age of 20 if someone participates in high impact sports like football, soccer, tennis, basketball, and high-impact aerobics. Interestingly, long-distance running has not been shown to increase the risk of osteoarthritis.²

Clearly, if you're overweight, have played contact sports, and you're getting older, the likelihood of developing OA are going to be high. The most common symptom of osteoarthritis is pain in the joint after repetitive use or after periods of inactivity, such as sitting in a theatre or at a computer for a while. Joint pain is usually worse later in the day.²

OA can affect the hands, feet, hips, knees, neck and spine.^{1,2} OA of the feet and hands may have genetic origin, with numerous female members of one family developing it.²



Heberden's nodes are hard bony enlargements in the fingers which may form with OA. They are not necessarily painful, but do limit movement of the fingers.⁶

Photo courtesy of Wikipedia.org

OA is not related to rheumatoid arthritis or other types of arthritis. Rheumatoid arthritis is a systemic autoimmune disease where the body's immune system attacks its own tissues leading to inflammation of the joints and around other organs.⁷ Blood tests can show if rheumatoid arthritis is likely, however no tests are available for osteoarthritis.

Diagnosis of osteoarthritis is made by determining if symptoms are present: cracking and popping, inflammation of joints, reduced range of motion, pain and tenderness when joints are moved or pressed on.⁸ X-rays of the affected joints will show reduced space within joints, wear at ends of the bones and/or bone spurs.⁸

Treatment

Evidence of osteoarthritis in humans dates back to 4500 B.C. and has been referred to as the most common ailment of prehistoric people.⁹ Since this ailment has been around for a very long time, remedies abound from copper bracelets to prescription steroid shots, some highly speculative or somewhat superstitious, and some posing serious side-effects and health risks of their own. There is currently no known cure for osteoarthritis, however there are things that can make life much more comfortable and slow down the progress of deterioration.

Basic treatment that aims at improving biomechanics, injury prevention, weight control, strengthening and low-impact exercises should always be the first line of defense.¹⁰ Learning more about how to care for the joints, participating in physical therapy, and wearing supportive devices can be helpful.¹¹ Treatment consists of attempting to aid the ailing joints through strengthening, support, reduction of inflammation, and prevention of further damage to the cartilage, and secondarily to reduce pain.

Exercise – Physical therapy can be helpful, but all of the following major exercise types are extremely important in treatment of OA.^{1, 11, 12}

- stretching and range of motion
- strength training
- aerobic or endurance exercise
- movement and body awareness like tai chi and yoga

Being physically active encourages the production and flow of lubricating joint fluids, builds muscle strength, helps weight control, improves flexibility and joint movement, and eases pain in joints.¹

Bicycling or stationary cycling is great for strengthening the quadriceps above the knee and can help reduce symptoms significantly in arthritis of the knee.¹⁰ Swimming and water aerobics are great non-impact activities which can improve strength without further damaging the joints.¹⁰ Although not much research has been done to verify, yoga is reported to be very helpful in reducing hand pain, increasing range of motion, and it improves posture, balance, joint position sense, coordination, and relaxation.^{10, 12}

Diet – Nutrition is often regarded with skepticism by the medical community in dealing with osteoarthritis. However in reality, since this condition is largely a result of long-term deterioration, dietary factors over the years may actually play a significant role in the prevention or the advancement of cartilage and joint deterioration. Rather than focus on medical solutions that only relieve symptoms through the use of drugs, including nonsteroidal anti-inflammatories (NSAIDS) which have serious adverse side-effects, nutrition, functional foods, and nutraceuticals could provide a significant alternative because they are devoid of adverse effects.¹³ Public interest in dietary solutions is high.¹³

Maintaining a healthy weight is critical. Drinking 64 oz. of water daily keeps the body's tissues hydrated and lubricated.

Broccoli and garlic. Current research in England is looking at the benefits of eating broccoli on osteoarthritis.¹⁴ A compound in broccoli, sulforaphane, has been found to block the enzymes that cause joint destruction in osteoarthritis.¹⁴ Eating broccoli leads to a high level of sulforaphane in the blood, but it's not yet known if it gets into the joints in amounts large enough to be effective. The three-year study starting in 2010 will also look at other effects of diet on osteoarthritis, including diallyl disulfide found in garlic, which also appears to slow cartilage destruction in laboratory tests.¹⁴ Since broccoli and garlic are known to have many other health benefits, until further research is done, these cannot hurt and it might help OA symptoms as well as overall health.

Omega Fatty Acids. Correct dietary Omega fatty acid balance does have an anti-inflammatory effect. In general, Americans tend to intake far too much Omega-6 fatty acid relative to Omega-3 fatty acids. Consumption of Omega-3 fish oil will, over time, reduce inflammation.^{15, 16, 17} Very recently, research has found that aspirin induces the body to produce a type of compound (17R-

resolvin D1) which alleviates arthritis, among other ailments.¹⁶ New research is constantly revealing more about the mechanisms of how Omega-3's aid in inflammation, but it is well established that they do play an important role in the reduction of chronic inflammation. Please refer to our article on inflammation for a complete discussion on Omega fatty acids, "Feeling Swell: Arming your body in the inflammation battle".

Selenium. Adequate selenium in the diet is important in preventing several diseases including osteoarthritis, cardiomyopathy, cancer, depression, and cretinism, and it is useful in helping the body's defenses against HIV.¹⁸ Excess selenium results in toxicity including decalcification of bones, and increased risk of type 2 diabetes.^{18,19} Dietary sources are the safest way to ingest selenium rather than supplements. It is very difficult to determine how much selenium is being consumed since it is largely a function of the soil content in a particular region where food is grown. Volcanic areas of China where selenium levels in the soil are extremely low result in selenium deficiency in the diet.¹⁹ Levels of selenium in the soil vary widely throughout Europe and soil levels in the U.S. are generally fairly high.¹⁹ The generally accepted daily intake of selenium is 55 micrograms/day. In the U.S. this level is often exceeded, probably not to a dangerous extent, however taking supplements is not advisable.¹⁹ Selenium is contained in whole wheat products, beef, fish, and shellfish.^{19,20}

Acupuncture – Some people find pain relief through acupuncture.^{10 21} Research findings are mixed as to whether acupuncture helps, but in many cases, it does improve function and reduces pain.¹⁰ A recent exhaustive review of research on the use of acupuncture to relieve knee pain found that of the 3,835 patients included in the meta-analysis, acupuncture significantly reduced pain and improved function over patients who received sham acupuncture, received standard care, or who were on a waiting list to receive care.²²

Supplements and Nutraceuticals

The USDA utilizes the term dietary supplement to describe pills, powders, and other non-food compounds. Nutraceuticals are generally considered the bioactive chemical compound derived from a food, but available in a non-food form.¹³ It's always easier to pop a pill than to make lifestyle modifications, but most supplements available have still not been found to be conclusively helpful in dealing with OA. Many can help with the pain and inflammation, but few, if any have been shown to reverse or diminish the deterioration of the joints. Supplements may help, but the biggest things you can do to help the situation are the suggestions preceding this section.

Glucosamine and Chondroitin. 42 clinical studies have concluded that these treatments are beneficial.¹⁰ Some very well-controlled studies have been conducted, but the findings are still inconclusive, with these supplements sometimes indicating significant improvement in OA patients and other times, not.²³ Glucosamine is thought to promote formation and repair of cartilage, while Chondroitin is believed to increase water retention and elasticity in cartilage and to inhibit enzymes that break down cartilage.²³ Looking at the sum of the evidence, it appears that taking at least 1,500 mg of glucosamine daily for at least 3 years may help slow down the degenerative process, increase the generation of new cartilage, prevent collagen from breaking down, and protect the joints from damage.^{23, 10} Results for chondroitin are not as conclusive, but both glucosamine and chondroitin are extremely safe to take and it appears to at least help those with moderate to severe knee pain.¹⁰

One of the most effective and natural ways to get a good supply of glucosamine and chondroitin is through diet.^{24, 25} In our haste to cut corners on cooking, we have thrown out many of the time honored and, it turns out, healthful ingredients in our food. Any good cook knows that a good broth is the foundation for making almost any meal whether it's rice, soup, sauce, or other entrée.

The best broth is made by cooking bones, which today are usually discarded right off the bat when the butcher carves up an animal for meat. Another source of glucosamine is discarded when we eat crab, shellfish, or eggs. The shells of these foods are rich in glucosamine and chondroitin.^{24, 25} Create a corner of your freezer where you accumulate all of these discards and trimmings, or simply go to the butcher and buy a package of bones, generally offered free or very inexpensively. Obviously, animals that have been pasture raised, grass-fed, and raised without hormones or antibiotics are highly recommended. Throw everything into a pot, cover with clean water, toss in a few seasonings if you want, and cook. A pressure cooker will get the job done in about 20 minutes or you can simmer everything for a day. Everything should be falling apart at that point. Remove the bones, strain out the shells, and let the broth cool. Skim off the fat once it's cold and you'll have a nice pot of gelled broth rich in glucosamine and chondroitin. Run through the blender if you prefer to have a nice smooth texture and to grind up remaining pieces of cartilage.

SAMe (S-adenosylmethionine). A substantial body of research indicates that SAMe can relieve symptoms of OA, is about as effective as standard anti-inflammatory drugs at reducing inflammation, and may protect the cartilage from damage.²⁶ SAMe appears to be quite safe, only occasionally causing mild digestive distress, though not causing damage to the stomach.²⁶ SAMe is expensive at the recommended dosage of 200 mg to 400 mg, 2 to 4 times daily.²⁶ The higher dosage and frequency is indicated for severe symptoms, though a lower dosage may be required to start if mild stomach distress is experienced. The lower dosage may be sufficient for maintenance after symptoms are relieved and will make the supplement more affordable. A lower dosage will likely not be sufficient to relieve severe symptoms, however.²⁶

Avocado/Soybean Unsaponifiables (ASUs). Several controlled studies have shown great promise of ASUs in relieving symptoms of OA, particularly knee OA. There was no significant difference between dosages of 300 mg or 600 mg daily, so the lower dosage would be recommended.¹³ Though ASUs appear likely to improve symptoms, it's still unclear whether they are effective in reversing or inhibiting structural damage.¹³ The effects of avocado unsaponifiables alone or soybean unsaponifiables alone have been shown to have some efficacy, while other research indicates that they may act synergistically, so more research is required.¹³ Considering that 93% of the soybeans grown in the United States are genetically modified, we are very hesitant to recommend consumption of concentrated doses of soybean supplements regardless of the promising research findings.²⁷ Unless you find an organic source for ASU's, we cannot advise their use.

Cetylated Fatty Acids. These naturally occurring fatty acids can be used as either a topical cream or as a supplement. Solid controlled studies have shown that either of these appear to significantly reduce swelling and pain while increasing mobility. Results are preliminary, but so far these look promising.²⁸ A typical oral dose of Cetylated Fatty Acids is 1,000 to 2,000 mg daily. Creams are applied 2-4 times daily.²⁸

MSM (methylsulfonylmethane). Research on MSM is lacking, though the claim is that MSM is supposed to help relieve the pain associated with OA. Chemically, it is related to DMSO (dimethyl sulfoxide), a chemical solvent, which is no longer approved as a supplement because of a large range of adverse reactions.²³ How MSM is used by the body is not well understood, though it contributes to the sulfur in the body which can be used to synthesize certain amino acids (protein building blocks), and it can act as an antioxidant.²³ Evidence does not strongly support use of MSM as a supplement.²³

Ginger and Turmeric. Natural COX-2 inhibitors are found in ginger and turmeric. These natural alternatives do not have the associated side effects of synthetic COX-2 inhibitors.^{Weil} Turmeric is an Ayurvedic remedy for reducing inflammation.³⁰ Ordinarily, turmeric is not absorbed by the body well.³¹ Addition of black pepper while consuming turmeric increases absorption by twenty-fold.³¹ It is extremely easy and inexpensive to make your own turmeric paste and we advise adding ¼ tsp. of black pepper.³⁰ This can be made into a delicious beverage, added to smoothies, soups. We do suggest that you consume this at bedtime because it stains the tongue a shocking ochre color for several hours which is disturbing to others you may be interacting with. Sources for herbs and spices are listed below under Resources.

Pycnogenol. Research of one study has shown that pycnogenol, an extract from the bark of the French maritime pine tree, was very successful in significantly improving performance of people walking on a treadmill ($p<0.05$), decreased the use of other drugs ($p<0.05$), decreased gastrointestinal complications, reduced treatment costs, and significantly reduced foot edema ($p<0.05$).^{32, 33} The control group, matched for age, sex distribution, mobility scores while walking on a treadmill, walking distance, and use of anti-inflammatory drugs, received a placebo. More research is needed to replicate these findings and gain status as a potential treatment³⁴, but the findings are quite promising. A generally recommended dosage is 150 to 300 mg daily.³³

Bee venom. Bee venom has been used to treat arthritis for over 2,000 years and it contains many anti-inflammatory properties.³⁵ Many of the active components of bee venom are peptides, one of which is melittin which stimulates the body to produce cortisone 100 times more potent than hydrocortisone.³⁵ Many other peptides in bee venom act in beneficial ways to reduce inflammation, immunological effects and have multiple other beneficial effects. In addition to anecdotal evidence and common knowledge among beekeepers that this treatment works, some controlled research indicates that bee venom, either injected or used at acupuncture sites, can provide significant relief to people suffering from OA, *as long as they are not sensitive or allergic to bee venom.*³⁶ Further research is required. The high levels of cortisol generated by the body may increase risk of complications such as Cushing's syndrome unless dosage is carefully controlled.

Gammalinoleic acid (GLA) – This essential fatty acid is found in borage oil, evening primrose oil, and black currant oil. GLA has been found to be helpful by some controlled studies in the relief of rheumatoid arthritis³⁷, and it's use in treating heart disease, rheumatism, and inflammation dates back to the Middle Ages.³⁸ Good research is lacking with regard to it's usefulness in relieving pain in osteoarthritis, but several practitioners recommend it and have found it helpful to their patients.^{38, 39}

The body manufactures GLA from linoleic acid found in many plants and meats, but becomes less efficient at this as the body ages. Borage oil contains a high percentage of GLA.² GLA is an Omega 6 fatty acid, which can promote inflammation unless it is balanced with the correct amount of Omega 3 fatty acids.³⁸ Borage oil comes in 1,000 mg capsules containing 240 mg of GLA, a standard therapeutic dosage.³⁸ Evening primrose and black currant oil capsules are less potent, so more is required to obtain a daily dose of 180 -320 mg of GLA.³⁸

Yucca, Mangosteen, Copper bracelets, magnets, etc. – No scientific evidence shows that these types of remedies are effective at all.^{10, 40, 41}

Supports

Wearing lightweight elastic wraps or supports can be quite helpful and has been shown in one study to reduce knee pain by 40% after wearing the wrap for 3 weeks.¹¹ Wearing shock

absorbing insoles, shoes, or orthopedic shoes can help in daily activities and during exercise.¹¹ (See Resources).

Other Factors

Weather and Climate – Interestingly, moving to a warm climate does not appear to help. In fact, one study found that people living in warmer places tend to be more sensitive to minor shifts in temperature than people living in cold, damp climates and they experience pain just as readily.¹¹ Considering the prevalence of complaints about OA in inclement weather, there is almost no research to study this. One study that looked at precipitation, barometric pressure, and temperature factors found no significant effect of any of these on OA pain.⁴² Anecdotal reports by patients are often contradictory or inconsistent, though it appears that perhaps *changes* in weather, rather than the actual weather status, is what causes the pain.⁴³

Drugs - Nonsteroidal anti-inflammatories (NSAIDs) such as ibuprofen and naproxen have traditionally been the first choice for managing arthritis pain and inflammation and they can be effective for short-term relief of inflammation and pain. Long-term use, especially with older people, should be avoided because they often cause moderate to severe irritation of the stomach and intestines (GI), even ulcers and bleeding, heart problems and kidney failure^{1, 44} Prescription opiates are likely safer alternatives for older people and addiction is rarely a problem if taken as directed.⁴⁴

RESOURCES: (We do not receive any financial benefits from sharing resource information.)

Mountain Rose Herbs – Certified Organic Herbs, Spices, Oils, Extracts, and Supplements
<https://www.mountainroseherbs.com/>

Frontier Natural Foods CoOp – Natural and Organic Foods and Spices (not all organic)
<http://www.frontiercoop.com/>

MEGAcomfort Insoles – Podiatrist designed memory foam and gel layered insoles. The Insole Shop. <http://www.insoleshop.com/ProductCatalog.aspx>

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