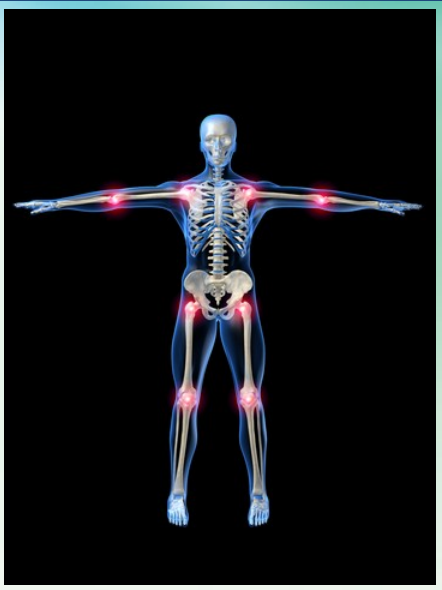

Proven Natural Remedies for Joint Pain, Arthritis & Inflammation

Dr. James Meschino, DC, MS, ND

About Dr. James Meschino, DC, MS, ND

A recognized expert in the use of nutritional supplements in the prevention and management of degenerative diseases and anti-aging, Dr. James Meschino, DC, MS, ND, was appointed to the advisory board of the Academy of Anti-Aging Research in 2001. He is a doctor of naturopathy, an associate professor at the Canadian Memorial Chiropractic College and has been a Faculty Member of the American Council of Exercise (ACE). He is also a faculty member of the Integrative Cancer Therapy Fellowship Program for physicians, sanctioned by the American Academy of Anti-Aging Medicine.

Dr. Meschino has appeared as a health and anti-aging expert on many television and radio programs in Canada and the United States.

The published author of five nutrition, supplementation and wellness books, he has also had over 50 research review papers on nutritional supplementation published by America -Online and is the regular anti-aging and natural therapies columnist for *Dynamic Chiropractic*. Dr. Meschino's continuing education seminars for health practitioners are authorized for continuing education credits in many states and provinces throughout North America.

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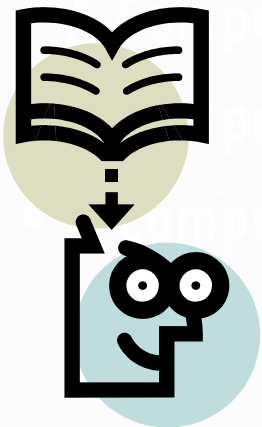
Introduction

Many clinical studies show that natural supplements can preserve our joints as we age, preventing age-related arthritic change. At more therapeutic doses the same nutrients can help stabilize, and sometimes rebuild, cartilage in patients who already have arthritis, resulting in a reduction of pain and suffering **and** improvement in joint function and quality of life. In fact, some supplements ***can actually replace anti-inflammatory and pain-killing medications***.

This is important because recent studies have shown that drugs like aspirin, acetaminophen and other non-steroidal anti-inflammatories (indomethacin, diclofenac, ibuprofen) have become a common cause of intestinal ulceration and bleeding, liver damage and liver failure, kidney damage (sometimes requiring dialysis), increased blood pressure, chronic heart failure and premature death from cardiovascular disease.

...recent studies have shown that drugs like aspirin, acetaminophen and other non-steroidal anti-inflammatories ... have become a common cause of intestinal ulceration and bleeding, liver damage and liver failure, kidney damage, ...increased blood pressure, chronic heart failure and premature death from cardiovascular disease.

*(Reference - **Cause for Concern in the Use of Non-steroidal Anti-inflammatory Medications in the Community A Population-Based Study** Robert J Adams; Sarah L Appleton; Tiffany K Gill; Anne W Taylor; David Wilson; Catherine L Hill Authors and Disclosures Posted: 09/27/2011; BMC Family Practice. 2011;12 (70) © 2011 BioMed Central, Ltd)*



This eBook summarizes everything you need to know about diet and supplementation relative to helping prevent and better manage age-related arthritis, joint pain, and joint, muscle, tendon, bursa-and fascia-related inflammatory conditions (e.g. tennis elbow, plantar fascitis, bursitis, muscle strain injuries, etc.)

Part 1: Preventing and Managing Osteoarthritis

The Aging Clock and Arthritic Changes

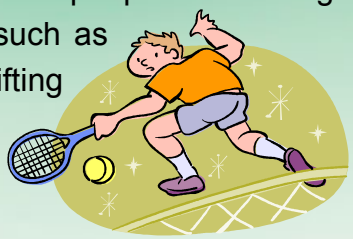
A major time bomb is set off by the body's aging clock around age 40, which sets the stage for osteoarthritis, in all of us. At this time in our lives the aging clock triggers a decline in synthesis of a substance called glucosamine. Most people think of glucosamine as a supplement for osteoarthritis treatment, but the truth is that your body actually makes glucosamine. In fact, in most cases your body makes all the glucosamine necessary to keep your joints healthy and functional up to age 40. The problem is that after age 40 the body stops making optimal amounts of glucosamine, and this allows the slow erosion of your joint cartilage to begin, eventually leading to degenerative arthritis (also known osteoarthritis). This is a primary reason why osteoarthritis develops in everyone (to varying degrees) as we age, unless you take a glucosamine supplement to provide your body with the glucosamine it can no longer make for itself.

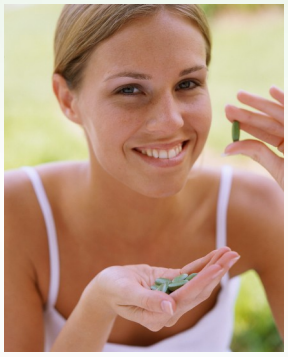
The problem is that after age 40 the body stops making optimal amounts of glucosamine, and this allows the slow erosion of your joint cartilage to begin, eventually leading to degenerative arthritis .

The glucosamine story is very important to your long-term quality of life because osteoarthritis is the most common joint disease that develops in humans and vertebrate animals. Virtually everyone who lives past age 75 suffers from it to varying degrees and nearly 50% of the population is affected by osteoarthritis by the age of 65. Although osteoarthritis is not a life-threatening disease, the pain, swelling and stiffness of osteoarthritic joints can make your life quite miserable, and severely compromise your quality of life.

This is a primary reason why osteoarthritis develops in everyone as we age … unless you take a glucosamine supplement to provide your body become with the glucosamine it can no longer make for itself.

If left unchecked, osteoarthritis usually progresses to a degree that will prevent you from doing many of the things you may love to do, such as playing tennis or any racquet sport, down-hill or cross-country skiing, jogging or running sports (e.g. soccer, basketball), playing hockey, cycling, rollerblading, as well as many other sports and recreational activities. It quite often prevents people from being able to perform even the most basic everyday tasks such as bending over to remove items from the trunk of a car, lifting a suitcase, carrying grocery bags, vacuuming, sewing, knitting, writing, or even having sex.



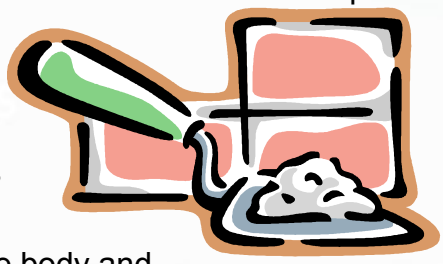


Of course, if you allow joint cartilage erosion to progress to an extensive degree, then you will likely wind up requiring knee replacement and/or hip replacement surgery — things most of us would like to avoid. So, rather than just hoping and praying that osteoarthritis doesn't affect you in a serious way as you age, simply start putting the glucosamine sulfate back into your body that it no longer makes for itself after age 40, by supplementing with a well-designed glucosamine supplement each day.

So rather than just hoping and praying that osteoarthritis doesn't affect you in a serious way as you age, simply start putting the glucosamine sulfate back into your body that it no longer makes for itself after age 40, by supplementing with a well-designed glucosamine supplement each day.

How Does Glucosamine Prevent Joint Erosion and Osteoarthritis?

The cartilage in our joints is designed to be the body's natural shock-absorbers. It consists largely of a tough protein material called collagen as well as chondroitin sulfate. Collagen provides the structural backbone of joint cartilage, whereas chondroitin sulfate fills in the space between the collagen fibers, just as mortar fills in the space between the bricks of a house. The raw material from which the body makes chondroitin sulfate is glucosamine. Cartilage formation, and its on-going maintenance, requires the continuous synthesis of both collagen and chondroitin sulfate because old collagen fibers and old chondroitin sulfate are broken down by the body and replaced by new collagen fibers and new chondroitin sulfate on a continual basis throughout our lifetime. Thus, when glucosamine synthesis declines after age 40, your body can no longer make the necessary amount of chondroitin sulfate it needs, thereby leading to joint cartilage erosion, osteoarthritis and a reduction in the shock-absorbing capacity of your joints.



The chondroitin sulfate, that is interspersed between the collagen fibers, not only increases the shock-absorbing action of joint cartilage, but it also acts like a water magnet to hold moisture within cartilage, further increasing the shock absorbing capabilities of joint cartilage. In fact, healthy cartilage that contains youthful amounts of chondroitin sulfate is 75-80 percent water by weight. As such, the inability to make optimal amounts of chondroitin sulfate leads to thinner cartilage pads. As such, our bones move closer together (loss of normal joint space), and may even rub against each other in more severe cases of osteoarthritic degeneration . In most cases even mild to moderate osteoarthritic changes produce some level of pain and inflammation.

Erosion of the joint cartilage also contributes to joints that become stiff, disfigured, less flexible, and show a loss of normal range of motion. All of this adds up to the symptoms and signs of osteoarthritis, which often produces chronic pain, inflammation, morning stiffness, and frequently restricts afflicted individuals from participating in many different activities that they were once able to enjoy, as mentioned previously. As such, osteoarthritis doesn't only cause physical pain and suffering, but it also contributes to compromised quality of life by frequently restricting an individual's ability to perform work and home-related tasks and participate in many of life's fun and joyful activities.

All of this adds up to the symptoms and signs of osteoarthritis, which often produces chronic pain, inflammation, morning stiffness, and often restricts afflicted individuals from participating in many different activities that they were once able to enjoy.

...there is sufficient clinical evidence that a well-designed glucosamine supplement can provide cartilage cells with the glucosamine sulfate they can no longer make, in adequate quantities, for themselves....

Thus, the age-related decline in glucosamine sulfate synthesis has been shown to contribute to degeneration of joint cartilage, promoting the development of osteoarthritis as we age. The good news is that there is sufficient clinical evidence that a well-designed glucosamine supplement can provide cartilage cells with the glucosamine sulfate they can no longer make, in adequate quantities, for themselves, thereby preventing cartilage thinning and erosion and, hence, preserving the integrity of our joint cartilage. Enabling cartilage cells to make more youthful levels of chondroitin sulfate is the key to preventing cartilage degeneration and osteoarthritis; this can be accomplished by using a glucosamine supplement beginning at age 40.

Taking Action to Prevent Osteoarthritis

- ✓ Supplement each day with 500 or 1,000 mg of glucosamine sulfate, beginning at age 40
- ✓ Glucosamine sulfate supplementation can compensate for the impaired glucosamine synthesis that occurs after age 40
- ✓ Supplementation with glucosamine sulfate provides cartilage cells with the ability to make more optimal levels of chondroitin sulfate and slow and/or reverse the aging effect on our joints that leads to osteoarthritis
- ✓ Glucosamine sulfate is an effective natural treatment for individuals who already suffer from osteoarthritis and other joint cartilage injuries

My advice, which I follow myself, is to supplement each day with 500 or 1,000 mg of glucosamine sulfate, beginning at age 40. Many studies have demonstrated that glucosamine sulfate supplementation can compensate for the impaired glucosamine synthesis that occurs after age 40, providing cartilage cells with the ability to make more optimal levels of chondroitin sulfate and thereby, slow and/or reverse the aging effect on our joints that leads to osteoarthritis. In fact, many studies have shown that glucosamine sulfate is an effective natural treatment for individuals who already suffer from osteoarthritis and other joint cartilage injuries.

GLUCOSAMINE RESEARCH STUDIES

Since the early 1980's, researchers have conducted a large number of clinical and experimental investigations to determine if oral glucosamine sulfate supplementation can compensate for the age-related decline in glucosamine synthesis and thereby, block the progression of osteoarthritis and/or reverse or repair any existing joint cartilage damage. In the past thirty years glucosamine sulfate has been the subject of more than 300 scientific investigations and over 20 double-blind clinical studies. In a recent review, which appeared in the journal, Rheumatology Disease Clinics Of North America, researchers indicated that glucosamine supplementation has been shown to be highly effective in the treatment of osteoarthritis in all 13 double-blind clinical trials reviewed by these investigators.

In the past thirty years glucosamine sulfate has been the subject of more than 300 scientific investigations and over 20 double-blind clinical studies…researchers indicated that glucosamine supplementation has been shown to be highly effective in the treatment of osteoarthritis…

Glucosamine is a small and simple molecule that is readily absorbed from the gastrointestinal tract. In fact, studies demonstrate that 90-98% of glucosamine sulfate is absorbed intact from the intestinal tract. By contrast, somewhere between 0% and 13% of chondroitin sulfate is absorbed from the intestinal tract when you take it in a supplement, making it significantly less effective than glucosamine sulfate as an intervention in the prevention and management of osteoarthritis.

This is why I don't recommend supplements containing chondroitin sulfate. If you purchase them, you are really wasting your money to a significant degree. Some companies manufacture glucosamine supplements that also contain chondroitin sulfate. These, too, are very inferior to supplements that contain glucosamine and natural anti-inflammatory herbs (MSM, Quercetin, Bromelain) as you will see shortly.

> ***"This is why I don't recommend supplements containing chondroitin sulfate….very inferior to supplements that contain glucosamine and natural anti-inflammatory herbs…"***

Glucosamine Supplementation

- ✓Prevents
- ✓Reverses
- ✓Stabilizes

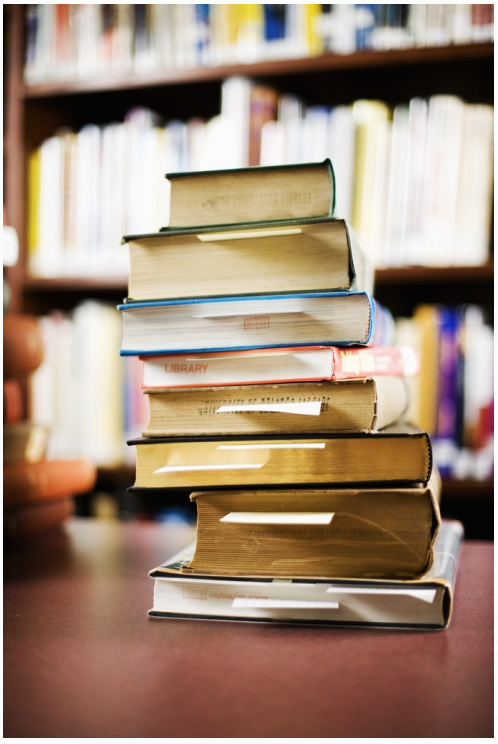
Once absorbed from the gut, glucosamine circulates through the bloodstream, where it can be taken up by cartilage cells (chondrocytes), providing them with the ability to make more optimal levels of chondroitin sulfate which fills in the gaps between the collagen fibers of our joint cartilage. As well, glucosamine sulfate is required for the synthesis of hyaluronic acid by the synovial membrane of the joint. Hyaluronic acid increases the viscosity of the synovial fluid and thus, serves to reduce the wear and tear stress on the articular cartilage and related joint structures. Glucosamine supplementation has also been shown to increase the synthesis of collagen by chondrocytes (cartilage cells). Thus, glucosamine supplementation has been shown to prevent, reverse and stabilize the major events in the osteoarthritic process by providing the raw material for the synthesis of chondroitin sulfate and hyaluronic acid, and stimulating the synthesis of collagen.

What Form of Glucosamine is Best?

Essentially all of the valid research on glucosamine has employed the use of glucosamine sulfate. Only glucosamine sulfate is approved as a treatment for osteoarthritis in more than 70 countries around the world and has been used by millions of people for this purpose for more than 30 years.

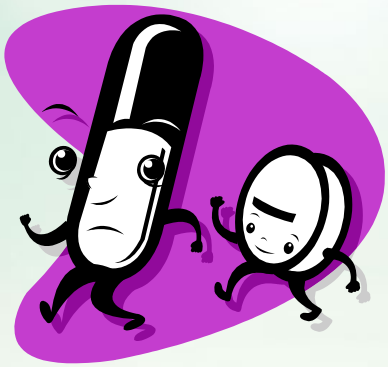
Glucosamine sulfate also delivers the mineral sulfur (hence the name glucosamine *sulfate*) to the joint cartilage. It has been recognized for many years that sulfur is a vital nutrient for the maintenance of joint cartilage. Sulfur is required to stabilize the connective tissue matrix of cartilage, tendons, and ligaments. Sulfur hot springs and the recent popularity and use of MSM (methlyl sulfonyl methane) by arthritis patients have provided strong anecdotal evidence that increasing the delivery of sulfur to the joints can help to alleviate arthritic symptoms to an appreciable degree. Experimental evidence indicates that sulfur has an anti-inflammatory effect and directly helps to maintain the structure and the integrity of joint cartilage. As such, the use of glucosamine ***sulfate*** provides the joint structures with the mineral sulfur as well as glucosamine - a double benefit in the prevention and management of osteoarthritis.

Other forms of glucosamine are present in the commercial market place such as N-acetyl-glucosamine and glucosamine hydrochloride. There is presently insufficient evidence to support their use and neither one of these forms provides the addition of the mineral sulfur, which has shown to be of value in osteoarthritis cases.



Clinical Studies with Glucosamine Sulfate

Glucosamine sulfate has been the subject of more than 300 scientific investigations and over 20 double –blind clinical studies. In a recent meta-analysis of glucosamine clinical trials in the treatment of osteoarthritis, McAlindon and colleagues indicated that all 13 studies that met the used accepted research methods showed that glucosamine supplementation improved signs and symptoms of osteoarthritis. This meta-analysis revealed that glucosamine supplementation reduced the symptoms and signs of osteoarthritis by 40.2% on average, compared with the placebo.



Glucosamine sulfate supplementation has also been investigated in head-to-head studies against non-steroidal anti-inflammatory drugs (NSAIDs), in the treatment of osteoarthritis. In a number of these trials, glucosamine supplementation was shown to produce better results in the long-term than ibuprofen and other NSAIDs in relieving the pain and inflammation of osteoarthritis. Unlike many NSAIDs, glucosamine has not been shown to produce any of the adverse side effects that are frequently encountered with the use of NSAIDs (gastritis, peptic ulcer, GI bleeding and erosion of the intestinal lining, liver and kidney toxicity, tinnitis).

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In one study (Qiu, G.X., et al. 1998), involving 178 Chinese patients suffering from osteoarthritis of the knee, the group given a daily dose of 1500mg of glucosamine sulfate demonstrated better results than did the group given ibuprofen at 1200mg per day (NSAID) with respect to reduction in symptoms of osteoarthritis. In this study, glucosamine sulfate was shown to be better tolerated than ibuprofen. Sixteen percent of the ibuprofen group dropped out due to adverse side effects from the drug. A six percent drop-out rate occurred in the glucosamine group. The authors of the study conclude that glucosamine sulfate is a selective intervention for osteoarthritis, as effective on the symptoms of the disease as NSAIDs but significantly better tolerated. As such, glucosamine sulfate seems particularly indicated in the long-term treatment needed in osteoarthritis.

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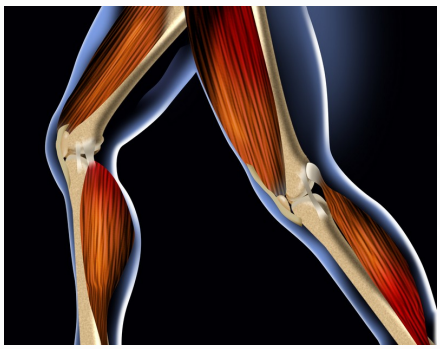
In North America, the medical profession has taken a skeptical view of the original research on glucosamine that has largely been performed in Europe and Asia. Acknowledging that oral glucosamine has been shown to be highly bioavailable and demonstrates impressive results in clinical trials with osteoarthritis patients, some researchers have criticized the research methodology of some of these trials, suggesting that North American trials are required before glucosamine can be recommended as a treatment for arthritis.

In 1999 and 2001, this request was answered when Reginster, et al, published their findings in the journals, *Arthritis and Rheumatology* and *Lancet*. The three-year randomized study by Dr. Reginster was a large randomized controlled analysis that was placebo-controlled, double-blind, and prospective in nature. It involved 212 patients with knee osteoarthritis. Weight-bearing and standard medical X-Rays of each knee were done at 1 and 3 years. Joint space width was also measured. Symptom and functional status were scored every 4 months using the Western Ontario and McMaster University Osteoarthritis index (WOMAC). The two groups had comparable baseline status, but after 3 years, there was no further joint space narrowing in the glucosamine group. The placebo group had further joint space narrowing and objective evidence of disease progression. As well, subject symptoms worsened in the placebo group, but the group taking glucosamine sulfate realized a marked reduction in symptoms of osteoarthritis over the three-year period. The authors concluded that glucosamine sulfate supplementation significantly reduced progression of knee osteoarthritis. Patients in the glucosamine group did not experience any untoward side effects. In the Lancet editorial, medical practitioners were encouraged to begin embracing certain aspects of the alternative movement, including the use of glucosamine as an effective lifelong intervention for osteoarthritis. As stated in the article, *"It is time for (medical doctors) to accommodate the possibility that many nutritional products may have valuable therapeutic effects and to regain the credibility of the public at large*".

The authors concluded that glucosamine sulfate supplementation significantly reduced progression of knee osteoarthritis



A recent study published in 2010 in the journal, *Arthritis Research and Therapy*, by Norman Ng and fellow researchers, once again showed that glucosamine sulfate supplementation improves signs and symptoms of osteoarthritis. These researches showed that 1500 mg per day of glucosamine sulfate supplementation significantly reduced pain, swelling, stiffness and improved joint function within 6 weeks, in a group of inactive patients with osteoarthritis of the hip and knee. They also showed that arthritic patients who began walking 30 minutes per day (5 days per week), in conjunction with 1500 mg of daily glucosamine sulfate supplementation realized even greater overall improvement in their arthritic symptoms.

Safety of Glucosamine Sulfate

Reported short-term adverse side effects from the use of glucosamine are generally mild and infrequent. These include mild gastrointestinal upset, drowsiness, skin reactions, and headache. Glucosamine sulfate has been shown to be non-toxic at prescribed doses. Patients allergic or sensitive to sulfa drugs or sulfate-containing food additives can safely take glucosamine sulfate. The word sulfate in this instance indicates the presence of the mineral sulfur, not the sulfa compounds used in sulfa drugs and sulfate-containing food additives. All cells of the body contain the mineral sulfur and thus, it is not possible to be allergic to this mineral. However, glucosamine sulfate is manufactured from the chitin exoskeleton of shellfish, such as lobster crab and shrimp. Therefore, it is conceivable that a person with a severe allergy to shellfish may be sensitive to the use of glucosamine, although the pharmaceutical grade of glucosamine is generally devoid of shellfish contaminants. Nevertheless, caution should be exercised in these cases. Some preliminary animal experiments and human trials on healthy individuals reveals that glucosamine supplementation may increase insulin resistance in some individuals by decreasing the synthesis of insulin receptors. In large clinical trials, this has not surfaced as a concern and no indication of pronounced glucose intolerance (blood sugar imbalance) has been demonstrated in the many well-documented glucosamine studies, including the study in *Lancet* and the glucosamine meta-analysis appearing in *The Journal of the American Medical Association*.

The word sulfate in this instance indicates the presence of the mineral sulfur, not the sulfa compounds used in sulfa drugs and sulfate-containing food additives. All cells of the body contain the mineral sulfur and thus, it is not possible to be allergic to this mineral.

Some doctors have told their patients not to take glucosamine if they are diabetic, but this is unwarranted, as many diabetic patients have benefited from the use of glucosamine without any adverse effects on their blood sugar. In fact, if the pain and disability of osteoarthritis is preventing a diabetic from being able to perform endurance exercise and the use of glucosamine can remedy this problem, as it has been shown to do in many cases, then the use of glucosamine can actually help in the management of diabetes because endurance exercise improves glucose tolerance, stabilizing blood sugar. Thus, it is advisable for diabetic patients and pre-diabetic patients with osteoarthritis to use glucosamine sulfate supplementation to manage their condition, and to simply have their blood glucose monitored during the first few weeks of glucosamine sulfate supplementation to identify any blood sugar irregularities that may occur.

Glucosamine Supplements Should Also Contain Natural Anti-inflammatory Agents

As good as glucosamine sulfate is at maintaining and repairing joint cartilage, the truth is that a well-designed glucosamine supplement should also provide natural anti-inflammatory agents. In this regard I suggest a formula containing glucosamine sulfate with bromelain enzymes, MSM and quercetin. I have seen this combination provide tremendous value to patients suffering from osteoarthritis in many different joints in the body (including the spine and degenerative disk disease). In addition, these anti-inflammatory agents also provide important anti-aging effects in that we all have a propensity for inflammatory processes to occur in our joints as we age. The natural anti-inflammatory agents, bromelain, MSM and quercetin can combat the inflammatory processes associated with aging, while the glucosamine sulfate is working to preserve our joint cartilage. This combination of glucosamine sulfate with bromelain, MSM and quercetin is the perfect anti-aging cocktail to help prevent joint cartilage erosion, suppress age-related joint inflammation, enabling your joints to maintain optimal function for many years longer than was believed possible by previous generations of people.

*This combination of glucosamine sulfate with **bromelain, MSM and quercetin** is the perfect anti-aging cocktail to help prevent joint cartilage erosion, suppress age-related joint inflammation, enabling your joints to maintain optimal function for many years longer than was believed possible...*

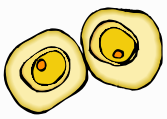
The simple fact is that, beginning at age 40, you have to take a supplement containing glucosamine sulfate, bromelain, MSM and quercetin to maintain healthy joints as you go through your forties, fifties, sixties, seventies, eighties and beyond. Having personally treated more than 10,000 patients I can tell you first-hand that being sidelined by osteoarthritic pain is no fun. Not only are you plagued by chronic pain, but it prohibits you from doing many of the activities you once loved. This problem is easy to prevent, so if you are 40 years or older, get started immediately with a daily supplement containing glucosamine sulfate, bromelain, MSM and quercetin at the following dosages:

- ✓ Glucosamine Sulfate: 500 mg
- ✓ Bromelain: 100 mg
- ✓ MSM: 133 mg
- ✓ Quercetin: 100 mg

Bromelain - Bromelain refers to enzymes that are derived from the stem of the pineapple. These enzymes have shown a remarkable ability to suppress the inflammation and pain of rheumatoid and osteoarthritis, sports injuries, and other joint inflammatory conditions. Like aspirin and many other anti-inflammatory drugs bromelain enzymes inhibits the cyclo-oxygenase enzyme, which in turn, blocks the synthesis of a hormone called prostaglandin series-2 (PG-2.) PG-2 is the primary local hormone that causes joint inflammation.

MSM (Methyl Sulfonyl Methane) -

MSM is a natural sulfur-containing compound that is produced by the human body and is found in limited quantities in certain foods, such as fruits, vegetables, and meats. MSM ingested in higher doses as a supplement has been shown to produce anti-inflammatory effects and to help support the integrity of joint cartilage, which has a high requirement for the mineral sulfur. It also has pain relieving properties and has been used to treat a wide variety of muscle and joint inflammatory conditions.



Cartilage cells

Quercetin - is a bioflavonoid compound that, like bromelain, has been shown to block the cyclo-oxygenase enzyme that produces PG-2. Blocking the synthesis of PG-2 suppresses joint inflammation in the prevention and management of osteoarthritis. Quercetin is also being studied intensively for its anti-cancer and anti-heart disease properties, which are most impressive.

Many medical doctors that I have met over the years, who treat cancer, often include quercetin supplementation in the nutritional management of their patients. Quercetin has been shown to enhance the effectiveness of some chemotherapy drugs and studies suggest it can help block the progression and recurrence of certain cancers when combined with other nutrients and medications. Getting some additional quercetin into your body each day to prevent and/or manage osteoarthritis may also help reduce your risk of cancer and heart disease – now that's a side effect you can live with.

Getting some additional quercetin into your body each day to prevent and/or manage osteoarthritis may also help reduce your risk of cancer and heart disease – now that's a side effect you can live with.

Dosage and Application

If you really want to remain free of arthritis or minimize its effects as you age, after age 40 you simply must take a joint supplement each day that contains the following:

Amounts per Capsule:	
Glucosamine Sulfate	**500 mg**
Bromelain	**100 mg**
MSM	**133 mg**
Quercetin	**100 mg**

- **To prevent osteoarthritis** simply take one capsule per day (after age 55, I suggest you take 2 capsules to be on the safe side).
- **If you already have osteoarthritis** then you will require 3 capsules per day. If you have osteoarthritis and you weigh more than 200 pounds or you are taking a diuretic drug for high blood pressure, then you will need 4 capsules per day for therapeutic purposes.

Part 2: Managing Other Common Inflammatory Muscle, Joint, Tendon or Fascia Conditions

As reported by Gottlieb in 1997, the management of osteoarthritis should include specific dietary and supplementation practices, in addition to other natural treatments such as joint mobilization, manipulation, muscle therapy, acupuncture and exercise.(1) In this regard, glucosamine sulfate has demonstrated the ability to halt joint cartilage destruction and help regenerate new cartilage in osteoarthritis cases. However, there is also substantial clinical and experimental evidence to suggest that the inflammatory aspect of many forms of arthritis and joint inflammatory conditions can be treated effectively with the use of certain supplements that demonstrate anti-inflammatory properties. In fact, small clinical trials indicate that many of these natural agents provide similar efficacy as conventional anti-inflammatory drugs, and are safer to use with respect to reported adverse side effects. Although compelling evidence exists, the medical profession as a whole has not adopted the use of these natural anti-inflammatory agents for use in joint inflammatory problems.(2)

...small clinical trials indicate that many of these natural agents provide similar efficacy as conventional anti-inflammatory drugs, and are safer to use with respect to reported adverse side effects.

Although compelling evidence exists, the medical profession as a whole has not adopted the use of these natural anti-inflammatory agents for use in joint inflammatory problems.

This situation may require some corrective action as it is well documented that non steroidal anti-inflammatory drugs, known as NSAIDS, produce intestinal tract ulcers (with potential internal bleeding) in 10-30% of long term users and erosions of the stomach lining and intestinal tract in 30-50% of cases.(3) As a result of these and other side effects NSAIDS use is associated with 10,000 – 20,000 deaths per year in the U.S.(4) Even the new COX-2 inhibitor drugs have only been reported to reduce intestinal tract damage by 50% and their toxicity to the liver and kidneys is still under review.(5) Anti-inflammatory drugs have been shown to accelerate damage and erosion of joint cartilage, advancing the osteoarthritic process. Conventional NSAIDS are also known to cause liver and kidney damage with long term use.(6)

These and other statistics have led certain esteemed investigators to conclude, “the epidemiological data highlight the importance of implementing ASA/NSAID therapy only when strictly necessary.” (7) Thus, if natural anti-inflammatory herbs and accessory nutrients can reduce inflammation without these noted side effects, it would be in the best interest of the patient and the health care system to adopt their use, even if the best outcome was simply to reduce reliance (dosage and/or frequency) on more harmful synthetic drugs.

Physiological Action of Natural Anti-inflammatories

Experimental research reveals that the efficacy of many natural anti-inflammatory agents stems largely from their ability to modulate the activity of the enzymes, cyclo-oxygenase and/or 5-lipoxygenase.(8) The pathophysiology of joint inflammatory conditions involves the conversion of arachidonic acid to prostaglandin series–2 (PG-2) by the cyclo-oxygenase enzyme. PG-2 synthesis is known to produce a pro-inflammatory effect, exacerbating joint inflammatory conditions. Accordingly, the conversion of arachidonic acid to leukotriene B4 (LTB-4), by the 5-lipoxygenase enzyme within white blood cells, is also known to contribute to the inflammatory process. White blood cell count in normal synovial fluid is less than 100ml on average, however, cellular response rises to 800ml or more in osteoarthritis and much higher than this in rheumatoid diseases; implicating white blood cells in the T-cell mediated inflammatory response in inflammatory joint conditions.(9) As is the case with many synthetic anti-inflammatory drugs, the active constituents of anti-inflammatory herbs have been shown to block the activity of the cyclo-oxygenase and lipoxygenase enzymes, inhibiting the synthesis of pro-inflammatory eicosanaoids of the PG-2 and LTB-4 series. As such, these natural substances have been shown to reduce inflammation and pain associated with various types of arthritis and traumatic joint injuries. Unlike their synthetic counterparts, they have not been shown to cause erosion injury to the intestinal tract, accelerate cartilage destruction or produce liver and kidney toxicity. (8) For these reasons, the following herbal agents can be considered as viable alternatives to the use of conventional anti-inflammatory drugs in a large percentage of arthritic patients and those suffering from other joint inflammatory conditions.

ANTI-INFLAMMATORY SUPPLEMENTS

Curcumin - is the active anti-inflammatory agent found in the spice turmeric. It has been shown to inhibit the activity of the 5-lipoxygenase and cyclo -oxygenase enzymes, blocking the synthesis of pro-inflammatory eicosanoids (PG-2, LTB-4). A large double-blind study demonstrated that curcumin was as effective as the powerful anti-inflammatory drug, phenylbutazone in reducing pain, swelling and stiffness in rheumatoid arthritis patients. It has also been shown to be effective in the treatment of post-surgical inflammation. Other studies indicate that curcumin can lower histamine levels and is a potent antioxidant. These factors may also contribute to its anti-inflammatory capabilities. For best results, practitioners should consider using a 95% standardized extract of curcumin derived from turmeric. As a singular agent the daily dosage to consider is 400-600 mg, taken one to three times per day. (Lower doses can be used if part of a combination formula containing other anti-inflammatory agents). Side effects are rare, but primarily include heartburn and esophageal reflux. As curcumin inhibits the cyclo-oxygenase enzyme system it may reduce platelet aggregation and thus, may potentiate the effects of anti-coagulant drugs. To date, no bleeding disorders have been reported with curcumin supplementation, but its concurrent use with warfarin or coumadin should be considered a contraindication. (2,8,10,11,12,13,14)

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It has also been shown to be effective in the treatment of post-surgical inflammation. Other studies indicate that curcumin can lower histamine levels and is a potent antioxidant.

Curcumin Recommendation:

- ✓95% standardized extract of curcumin, derived from turmeric
- ✓400 - 600 mg, 1 to 3 times daily

Boswellia - In clinical studies, the gum resin of the boswellia tree (yielding 70% boswellic acids) has been shown to improve symptoms in patients with osteoarthritis, and rheumatoid arthritis.(12,13) Research indicates that boswellic acids inhibit the 5-lipoxygenase enzyme in white blood cells. As a singular agent the usual dosage is 150mg, taken one to three times per day. (Lower doses are effective when combined with other natural anti-inflammatory agents.) Boswellia appears to have no important side effects or drug-nutrient interactions of concern.(15,16)

Boswellia Recommendation:

✓150 mg, 1 to 3 times daily

White Willow Extract - provides anti-inflammatory phenolic glycosides, such as salicin, which have been shown to be effective in the treatment of arthritis, back pain, and other joint inflammatory conditions. These phenolic glycosides are known to inhibit cyclo-oxygenase, blocking the production of PG-2 and exert a mild analgesic effect. Unlike ASA (synthetic acetylsalicylic acid), naturally occurring salicin (salicylic acid) does not irreversibly inhibit platelet aggregation, reducing the potential for a bleeding disorder. White willow extract has been shown to be slower acting than ASA, but of longer duration in effectiveness. The usual dosage is 20 - 40 mg of salicin, one to three times per day. (Note that 100mg of white willow extract at a 15% standardized extract of salicin content, yields 15mg of salicin per dosage.) (A lower dosage can be used if part of a combination formula containing other anti-inflammatory agents.) Side effects are rare, but primarily include nausea, headache and digestive upset. Contraindications may include conditions where ASA is contraindicated, including gout, diabetes, haemophilia, kidney disease, active peptic ulcer, glucose-6-phosphate dehydrogenase deficiency, and possibly asthma. However, the salicin content in a single dosage of white willow extract is very low compared to the acetylsalicylic acid content of ASA (e.g., 15mg vs. 320mg); thus, these conditions may not be absolute contraindications for the use of white willow bark extract. It is important to realize that, besides salicin, white willow extract contains other phenolic glycosides, which are also known to possess anti-inflammatory properties.[8,17,18,19]

White Willow Extract Recommendation:

✓20 - 40 mg of salicin, 1 to 3 times daily

(100 mg white willow extract at 15% standardized extract of salicin content yields 15 mg of salicin per dosage)

Ginger Root Extract - contains oleo-resins that have shown clinical benefit in the management of various arthritic and muscle inflammation problems, including rheumatoid arthritis, osteoarthritis, and myalgias. The active constituents in this regard have been shown to be gingerols (oleo-resins), which inhibit the cyclo-oxygenase and lipoxygenase enzymes. The usual dosage is 500mg, one to three times daily, standardized to 5% gingerol content. (A lower dosage can be used if part of a combination formula containing other anti-inflammatory agents.) Side effects are rare, but include heartburn and digestive upset. It should not be given to patients with gallstones. It may also induce a mild anticoagulant effect (by inhibiting cyclo-oxygenase enzyme in platelets), therefore it should not be taken concurrently with warfarin of coumadin. However, there are no reports of bleeding disorders with ginger supplementation and no adverse drug–nutrient interactions have been reported in the scientific literature to date. (2,8,14,20,21)

Ginger Root Extract Recommendation:

✓500 mg, 1 to 3 times daily

(standardized to 5% gingerol content)

Bromelain - contains anti-inflammatory enzymes that have proven ability to suppress the inflammation and pain of rheumatoid and osteoarthritis, sports injuries, and other joint inflammatory conditions. Bromelain has been shown to inhibit the cyclo-oxygenase enzyme, inhibiting the synthesis of PG-2. Bromelain also helps to break down fibrin (fibrinolytic), thereby minimizing local swelling. The usual dosage is 400mg, one to three times per day. (A lower dosage can be used as part of a combination anti-inflammatory formulation.) Bromelain may inhibit platelet clotting and is a known for its fibrinolytic properties. Therefore, it may potentiate the effects of anticoagulant drugs such as warfarin and coumadin and should not be recommended in these cases. (2,8,14,22,23,24)

Bromelain Recommendation:

✓400 mg, 1 to 3 times daily

Quercetin - is a bioflavonoid compound that blocks the release of histamine and other anti-inflammatory enzymes at supplemented doses (minimum 100-1500 mg per day). Although human studies with arthritic patients are lacking at this time, anecdotal evidence is strong for this application, as is experimental research investigation. There are no well-known side effects or drug-nutrient interactions for Quercetin. (14,25,26,27)

Quercetin Recommendation:

✓100-1500 mg daily

Devil's Claw - contains the anti-inflammatory agent harpogoside. Devil's Claw has demonstrated efficacy in the management of low back pain and is used traditionally as an anti-inflammatory by numerous southern African tribes. The usual dosage is 100-400 mg, one to three times per day. (A lower dosage can be used if part of a combination anti-inflammatory formula.) The only consistently reported side effect is mild digestive upset on rare occasions. It is contraindicated in patients with active gastric ulcers (may increase gastric acid secretion) and in patients taking warfarin or coumadin (due to its anticoagulant effects).(8,14,28,29)

Devil's Claw Recommendation:

✓100- 400 mg, 1 to 3 times daily

SUMMARY

The body of evidence supports the use of natural anti-inflammatory agents as viable alternatives to synthetic drugs or as a means to help patients lower their requirements for conventional anti-inflammatory pharmaceutical agents. A number of single and combination natural anti-inflammatory supplement products are available that meet the above dosage and standardized grade criteria. Along with these alternatives to synthetic anti-inflammatory drugs, dietary changes to lower arachidonic concentrations, the use of glucosamine sulfate to support joint cartilage synthesis and supplementation with a combination of flaxseed, borage seed and fish oil to promote the formation of anti-inflammatory eicosanoids (e.g. PG-1 and PG-3), should also be included in the biochemical management of these cases. Holistically-oriented practitioners interested in natural, safe and effective interventions to help manage joint inflammatory conditions should consider the inclusion of anti-inflammatory herbal and accessory nutrients as an adjunct to the management of arthritis and other inflammatory joint conditions.

- ✓Natural anti-inflammatories
- ✓Dietary changes
- ✓Glucosamine Sulfate
- ✓Essential Oils

Clinical Application

My preference is to provide patients with a combination supplement that includes curcumin, boswellia, white willow extract and ginger. Here is an example of the supplement I use:

Amounts per 3 Capsules:	
Turmeric extract (95% Curcumin)	**632 mg**
Boswellia (std. 70% Boswellic acid)	**600 mg**
White Willow Extract (std. 15% salacin)	**100 mg**
Ginger Root Extract (std. 5% gingerol)	**150 mg**

- **In cases of severe inflammation and pain:** take 3 capsules, 4 times daily. Reduce the dosage, as pain and inflammation subsides, using the lowest dosage possible to maintain improvement.
- **In cases of recent inflammatory injuries**, the patient is often able to discontinue the supplement once the healing is complete.
- **In more chronic cases**, ongoing supplementation with these natural anti-inflammatory agents helps to better manage the condition, reducing dependency on synthetic drugs, which pose a threat to the patient's health as outlined above.

Part 3: Rheumatoid Arthritis and Other Autoimmune Diseases Affecting the Joints

In many cases of autoimmune disease, especially those affecting the joints (e.g. Rheumatoid Arthritis), the patient is seldom provided with evidence-based nutrition and supplementation practices from their medical practitioner. Studies show, however, that specific dietary and supplementation measures can play a significant role in long-term management of these conditions, with respect to preserving joint integrity, reducing pain and inflammation, improving quality of life and extending years of functional living.

Clinical and preclinical studies have identified three main biological targets that can be favorably influenced in these patients using nutrition and supplementation-based interventions. These include:

- Suppressing inflammatory eicosanoids
- Inhibiting inflammatory and hyperproliferative cytokines and transcription factors
- Immune modulation (bioregulation of immune system)

Eicosanoid Synthesis and Inflammation

The inflammatory process involves the synthesis of prostaglandin series-2 (PG-2) eicosanoids. PG-2 eicosanoids are derived exclusively from the polyunsaturated fat known as arachidonic acid, which is found at appreciable levels in many domestic meat products. The over-ingestion of linoleic acid (from corn, sunflower, safflower and mixed vegetable oils, as an example) also encourages the conversion of linoleic acid to arachidonic acid, via desaturation and elongation biochemical pathways. Thus, reducing intake of high-fat animal products and using oils that are higher in monounsaturated fats (e.g. olive oil) in place of linoleic acid-rich vegetable oils, help to reduce the synthesis of PG-2 eicosanoids.

It is also well documented that omega-3 fats and supplementation with gamma linolenic acid (GLA) produces anti-inflammatory effects, via their conversion to prostaglandin series-3 (PG-3) and prostaglandin series-1 (PG-1) hormones, respectively. PG-3 and PG-1 are known to have anti-inflammatory effects. The precursor to prostaglandin series-3 eicosanoids is eicosapentaenoic acid (EPA), an omega-3 fat found in cold water fish and fish oil. However, docosahexaenoic acid (DHA) can be converted to EPA within the body. DHA is also found in fish and fish oil. Alpha-linolenic acid can also be converted to EPA via desaturation and elongation enzymes. Alpha-linolenic acid is an omega-3 fat found at high levels (58%) in flaxseed oil. To increase synthesis of PG-1 many patients supplement with borage seed oil, black currant oil and/or evening primrose oil. The GLA in these oils can be converted into dihommo gamma linolenic acid, which can then be converted into anti-inflammatory PG-1 eicosanoids.

As such, studies support a second step in controlling the production of inflammatory eicosanoids, which involves daily supplementation with essential fatty acids (EFA's), as explained above. (1-6). Based on the available data, I personally feel that a supplement combining 400 mg each of fish oil, flaxseed oil and borage oil is the ultimate EFA supplement for autoimmune patients, and those with other inflammatory conditions. This combination is also a very cost-effective formula and makes EFA supplementation practical for long-term patient compliance. I recommend 3-6 capsules per day, depending on the severity of inflammation. I also recommend 2-3 capsules per day for general prevention of cancer, heart disease, Alzheimer's disease, general well-being, and to promote healthy skin texture.

Based on the available data, I personally feel that a supplement combining 400 mg each of fish oil, flaxseed oil and borage oil is the ultimate EFA supplement for autoimmune patients, and those with other inflammatory conditions.

Studies also suggest that certain antioxidants (vitamin C, vitamin E, selenium, Beta-carotene etc), as well as certain B-vitamins (e.g. vitamin B6) and magnesium, act as cofactors and coenzymes to hasten the synthesis of anti-inflammatory PG-1 and PG-3 eicosanoids from their precursor polyunsaturated fatty acids. Various clinical studies have shown important anti-inflammatory outcomes and improved patient management of various autoimmune, and other inflammatory conditions, using supplementation with meaningful dosages of antioxidants, B-vitamins and/or magnesium. Vitamin B6 and antioxidants may also inhibit the inflammatory effects of Tumor Necrosis Factor Alpha, a cytokine that is known to perpetuate the inflammatory and hyperproliferative processes in many autoimmune diseases. (7-17) We will examine these cytokines as well as nuclear transcription factors in the next section.

A third way in which patients can suppress the synthesis of inflammation-promoting PG-2 is via supplementation with herbs that directly inhibit cyclo-oxygenase and lipoxygenase enzymes. These enzymes are responsible for the conversion of arachidonic acid into PG-2. Certain herbal agents, including curcumin, white willow extract, ginger, boswellia, and others, have shown significant effects on reducing various inflammatory conditions, including autoimmune diseases, in clinical trials. Thus, I also recommend a supplement containing curcumin, white willow extract, ginger and boswellia, which delivers therapeutic dosages of their active constituents. Patients usually require 1-3 capsules, three times per day, to achieve control of their inflammatory condition. These natural agents work in a similar way as aspirin, ibuprofen, COX-2 inhibitors and some other non-steroidal anti-inflammatory drugs, but without the risk of gastrointestinal bleeding, or liver and kidney toxicity. (18-36)

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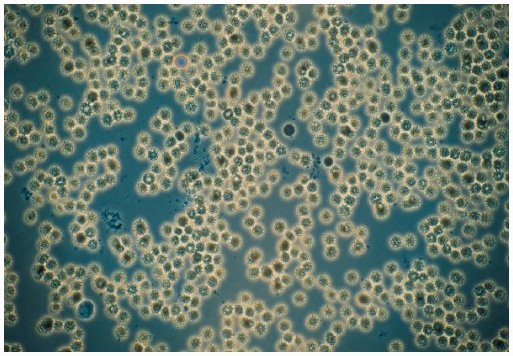
Inflammatory Cytokines and Nuclear Transcription Factors: *Hallmark Features of Autoimmune Disease*

In recent years it has been identified that, in many autoimmune diseases, macrophages (and some other immune cells to a lesser degree) secrete disproportionately high levels of a cytokine known as Tumor Necrosis Factor Alpha (TNF-alpha). In turn, TNF-alpha encourages other immune cells (and some non-immune cells such as endothelial cells) to increase the translocation of Nuclear Factor kappa beta (a cytoplasm-based protein) to the nuclear DNA of the cell. Acting as a transcription factor, Nuclear Factor kappa beta up-regulates genes that code for the synthesis of inflammatory and hyperproliferative cytokines such as Interleukin 1,6,8. Thus, in autoimmune diseases the over-secretion of TNF-alpha (primarily for activated macrophages) activates the down-stream effects of Nuclear Factor kappa beta on specific genes that promote the release of inflammatory and hyperproliferative cytokines. These events are a hallmark feature of many autoimmune diseases.



Pharmaceutical companies have introduced drugs that inhibit the action of TNF-alpha. These drugs demonstrate anti-inflammatory effects, but are associated with a myriad of untoward and undesirable side effects, including lymphoma, infections, congestive heart failure, demyelinating disease, a lupus-like syndrome, induction of auto-antibodies, injection site reactions, systemic side effects and opportunistic infections.

The reason for this is that, under certain situations, the release of TNF-alpha is desirable to help fight infections, and encourage programmed cell death (apoptosis) of emerging cancer cells. Thus, drugs that impose a complete blockade to the effects of TNF-alpha are associated with many adverse side effects, as described previously.

These drugs demonstrate anti-inflammatory effects, but are associated with a myriad of untoward and undesirable side effects, including:

- ***Lymphoma***
- ***Infections***
- ***Congestive heart failure***
- ***Demyelinating disease***
- ***Induction of auto-antibodies***
- ***Injection site reactions***
- ***Systemic side effects***
- ***Opportunistic infections***

The exciting news for complementary practitioners is the revelation that certain natural agents act as natural bioregulators of TNF-alpha and Nuclear Factor kappa beta. Natural agents such as curcumin, quercetin, Vitamin B6, and catechins have shown an ability to down-regulate the effects of TNF-alpha and Nuclear Factor kappa beta in cases where macrophages are over zealous. At the same time these agents do not inhibit the release of these cytokines and transcription factors when they are required to help fight infection or induce apoptosis of emerging cancer cells. These bioregulatory effects are indeed unique and noteworthy, as no drugs created to date can provide such bioregulatory influences on these important pathways. Curcumin is derived from the spice turmeric, quercetin is the most abundant flavonoid in nature, and catechins are found in green tea to an appreciable degree.

Thus in addition to the natural anti-inflammatory supplement I recommend containing curcumin, white willow extract, ginger and boswellia (as described previously), I also recommend additional supplementation with quercetin (usually 1000 – 2000 mg per day), and suggest that the patient replace coffee with 3-5 cups of green tea (preferably decaffeinated green tea) daily.

A final consideration is that vitamin D supplementation has been shown to up-regulate the synthesis and release of interleukin-4 from various immune cells. Interleukin-4 has established anti-inflammatory effects. (37-49). As such, I recommend that autoimmune patients consider taking 5,000 – 10,000 IU of Vitamin D daily, unless they suffer from sarcoidosis or hyperparathyroidism. Vitamin D also has other important bioregulation effects on the immune system, which may be helpful to patients with autoimmune disease. When taking supplements in this range it is important to monitor blood vitamin D levels to ensure it does not exceed 250nmol/L.

Vitamin D Recommendation:

✓5000—10000 IU daily

IMMUNE MODULATION

Bioregulation of the immune system has also been shown to be valuable in the management of autoimmune disease. Certain agents (e.g. thymus hormones), including various supplements, have been shown to down-regulate the secretion of TNF-alpha by activated macrophages, and provide other immune-modulating effects on immune cells, which have produced favorable outcomes in patients with various autoimmune conditions. Bioregulation implies that these nutrients can boost immune activity when immune function is weak or compromised, and suppress over-zealous behavior of immune function in patients with autoimmune conditions, reducing symptoms and episodes of exacerbation.

In some cases doctors inject patients with thymus peptide hormones (e.g. Zadaxin). However, certain natural supplements also provide significant immune modulation. My favorites include reishi mushroom extract and astragalus. Reishi mushroom extract has also been shown to inhibit the effects of Nuclear Factor kappa beta, as outlined above, making it a multi-modal agent in the complementary management of autoimmune conditions. (50-61). In addition, probiotic and prebiotic supplementation (FOS and Inulin) have also show important immune bioregulator effects in patients with various autoimmune diseases, as well as in cases of eczema (62,63).

Clinical Application

Autoimmune disease presents a daunting clinical challenge for medical and complementary health practitioners alike. As such, an aggressive proactive program is required, which must address the main molecular features and biological targets of these diseases to help tame them and provide patients with improved symptom control, quality of life and an ability to slow down or halt the progression of the disease. The main biological and molecular targets of importance to complementary health practitioners include specific eicosanoids, cytokines, transcription factors as well as immune modulation. In regard to diet and supplementation there is sound scientific support for practitioners to provide patients with following recommendations in the complementary management of autoimmune conditions, especially when joint involvement is a key feature of the disease:

1. **Decrease intake of high fat animal products** (exception is fish), as well as trans-fats, deep fried and pan-fried foods. Using olive oil and other monounsaturated fat-rich oils, in place of oils rich in linoleic acid is also beneficial in decreasing synthesis of PG-2 eicosanoids.
2. **Essential Fatty Acid Supplementation:** 3-6 capsules per day of a supplement containing 400 mg each of fish, flaxseed and borage seed oil.
3. **High-potency Multiple Vitamin and Mineral:** providing 1000 mg vitamin C, 400 IU vitamin E, 100-200 mcg selenium, B-60 complex, 200-300 mg magnesium, and all vitamins and minerals from A to Zinc.
4. **Natural Anti-Inflammatory Supplement:** providing a combination of curcumin, white willow extract, ginger and boswellia, at meaningful dosages and proven standardized grades.
5. **Immune and Detoxification Supplement:** providing meaningful dosages of reishi mushroom extract, astragalus, indole-3 carbinol and milk thistle.
6. **Glutathione Support Supplement:** The body cannot absorb glutathione from the intestinal tract to an appreciable degree. Supplements containing N-acetyl cysteine, alpha lipoic acid, L-glutamine and silymarin (from milk thistle) have been shown to increase cellular levels of glutathione, an important immune modulating, antioxidant and detoxification tripeptide.
7. **Quercetin:** 1000—2000 mg
8. **Vitamin D:** 5000—10,000 IU—requires blood monitoring of vitamin D levels
9. **Additional Antioxidants if necessary:** e.g., vitamin C (2000-5000 mg), vitamin E (1000-1600 IU), Selenium (200-500 mcg), Beta-carotene (25,000-50,000 IU)
10. **Probiotic and/or Prebiotic Supplementation:** twice daily

Part 4: Recent Report Highlights the Growing Dangers of Anti-inflammatory Medications

In the September 27, 2011, posting of the Biomedical Central Journal: *Family Practice*, RJ Adams and fellow researchers commented on concerns raised by the common prescribing of non-steroidal anti-inflammatory medications, with respect to their important and sometimes fatal adverse side effects. They state, "Non-steroidal anti-inflammation drugs (NSAIDs) are one of the most common causes of reported serious adverse reactions to drugs, with those involving the upper gastrointestinal tract (GIT), the cardiovascular system and the kidneys being the most common. Much of the focus on NSAID adverse effects has been on GIT consequences, with good reason. A U.S. study found **the rate of deaths from NSAID-related GIT adverse effects is higher than that found from cervical cancer, asthma or malignant melanoma**." (1). They also point out that frequent use of NSAIDs increases risk for high blood pressure, chronic heart failure, as well as serious cardiovascular events (with certain NSAIDs). Studies show that risk for these adverse side effects is increasing among the elderly and those with co-morbidities. The researchers cite recent evidence suggesting that the burden of illness resulting from NSAID-related chronic heart failure may exceed that resulting from GIT damage. (1)

"Non-steroidal anti-inflammation drugs (NSAIDs) are one of the most common causes of reported serious adverse reactions to drugs, with those involving the upper gastrointestinal tract (GIT), the cardiovascular system and the kidneys being the most common. "

"A U.S. study found the rate of deaths from NSAID-related GIT adverse effects is higher than that found from cervical cancer, asthma or malignant melanoma."

The researchers also cite evidence from a recent Danish population study, which suggests that cardiovascular mortality is increased among people without a prior history of heart disease, who frequently use NSAIDs. This seems to be particularly true for diclofenac and ibuprofen. However, the baseline cardiovascular risk of people in this study was not reported. They also note that NSAIDs promote the rapid deterioration of renal function. As such, national medical guidelines recommend avoidance of nephrotoxic drugs, including NSAIDs, in people with chronic kidney disease. (1)

Acetaminophen Adverse Events

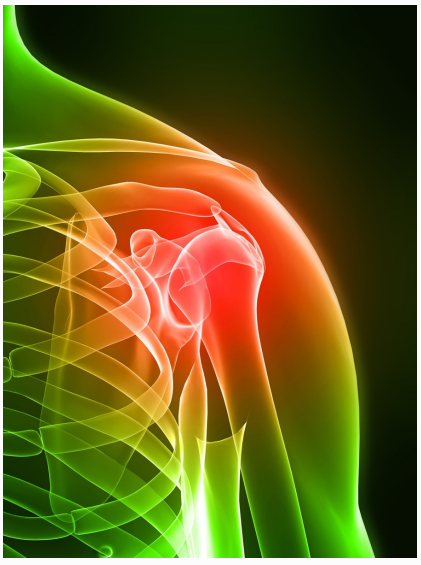
It's not only for NSAID medications, such as drugs containing aspirin, ibuprofen, indomethacin, diclofenac, COX-2 inhibitors, that there is concern for frequent and significant side effects, but also for acetaminophen-containing medications. The National Kidney & Urologic Diseases Information Clearinghouse *(A service of the National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health)* have posted the following precautionary notes about acetaminophen on their website:

"**Kidney Disease From Acetaminophen and NSAIDs** - A form of kidney damage, called analgesic nephropathy, can result from taking painkillers every day for several years. Analgesic nephropathy is a chronic kidney disease that over years gradually leads to irreversible kidney failure and the permanent need for dialysis or a kidney transplant to restore kidney function. Researchers estimate that four out of 100,000 people will develop analgesic nephropathy. It is most common in women over 30. (2)

A review article in *Life Extension* provides scientific references outlining the dangers of acetaminophen use over long periods. The authors state, "acetaminophen is a leading cause of liver failure in the Western world and the leading cause of drug-induced liver failure in the United States (Bartlett D 2004). People who have liver disorders or who consume large amounts of alcohol are advised to avoid acetaminophen, which can damage both the kidneys and the liver, even at therapeutic doses (Bromer MQ et al 2003). People who use acetaminophen on a regular basis double their risk of kidney cancer (Kaye JA et al 2001; Gago-Dominguez M et al 1999; Derby LE et al 1996). Most cases of acetaminophen poisoning occur because people take smaller doses over a long period of time. In this setting, doses of 4000 mg daily can be toxic." (3)

Drugs for Autoimmune Patients

Many people with autoimmune diseases also have inflammation of joints and other tissues. Some novel medications have been developed to inhibit the over-stimulation of tumor necrosis factor (TNF) on target tissues in these cases, as well anti-metabolite medications, such methotrexate and purine inhibitors, which decrease proliferation of the immune cells involved in the inflammatory and hyperproliferative signalling cascade.

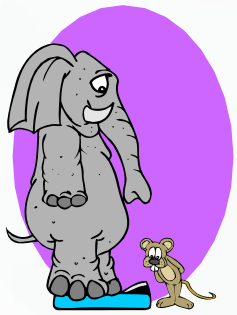


The side effects of TNF-inhibitors such as infliximab (Remicade), adalimumab (Humira), certolizumab pegol (Cimzia), or etanercept (Enbrel), include lymphoma, infections, congestive heart failure, demyelinating disease, a lupus-like syndrome, induction of auto-antibodies, injection site reactions, systemic side effects and opportunistic infections. (4)

The most common side effects of methotrexate include acne, chills and fever, dizziness, flushing, general body discomfort, hair loss, headache, infertility, irregular periods, itching, loss of appetite, lowered resistance to infection, miscarriage, nausea, sensitivity to sunlight, sore throat, speech impairment, stomach pain, swelling of the breast, unusual tiredness, vaginal discharge, vomiting. (5)

Common side effects of purine synthesis inhibitors include increased risk of infection, nausea, fatigue, hair loss, and rash. Azothioprine has been listed as a human carcinogen in the *11th Report on Carcinogens* of the U.S. Department of Health and Human Services. (6)

Adverse Side Effects of Corticosteroid Drugs (*e.g., Prednisone*)

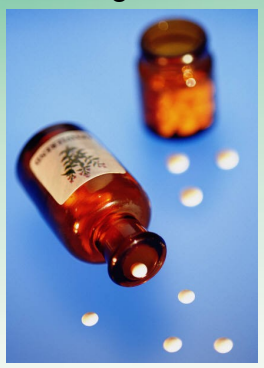


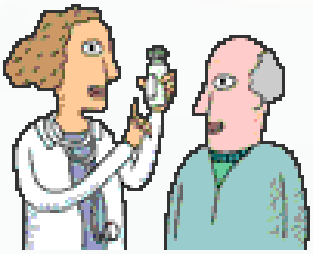
Long-term use of corticosteroid drugs, such as Prednisone and Dethamexasome, are known to cause weight gain – with redistribution of body fat to the upper back and neck (Buffalo hump), glucose intolerance, hypertension, increased susceptibility to infections and cancer from immune suppression, osteoporosis from demineralization, easy bruising, mood swings, insomnia, depression upon withdrawal, avascular necrosis of bone, abdominal striae, cataracts and acne. (7)

Summary and Realistic Options

It's not realistic to eliminate all anti-inflammatory drugs from the market due to the risk of serious adverse side effects. In some cases these drugs are life-saving (e.g., acute flare up of lupus and other autoimmune diseases), or have been shown to improve the management of various inflammatory conditions and improve quality of life for certain patients where no other forms of therapy or treatment have been useful. However, there are a number of dietary and supplementation practices that should also be implemented in these cases. I have described them in detail in previous sections of this eBook and in articles I have written. (*"Nutrition and Supplementation Management in Autoimmune Diseases"*, *"The Clinical Use of Natural Anti-inflammatory Herbs and Supplements"*, and *"The Research Status of Glucosamine Sulfate"*.)

The problem is that most medical doctors fail to teach their patients, who suffer from joint inflammatory diseases, how important it is for them to follow an anti-inflammatory diet and to use natural supplements that have proven anti-inflammatory and analgesic effects to help manage their condition (as well the use of glucosamine sulfate to support joint cartilage in osteoarthritis and cartilage injury management). These dietary practices and ingestion of anti-inflammatory and cartilage-supporting supplements can be taken concurrently with anti-inflammatory, analgesic and autoimmune medications. Their inclusion in the comprehensive management of these conditions can reduce the patient's need and dependency on synthetic medications, and thus reduce risk of significant side effects over the patient's lifetime.





My suggestion is that you speak to your health practitioner about the appropriateness of these strategies in your individual case and seek his/her guidance as to how to access supplements that meet the requirements outlined in this review.

- A Comprehensive Guide to Minerals
- A Comprehensive Guide to Herbs
- A Comprehensive Guide to Appropriate and Essen

For more information on this or other related topics, visit Dr. Meschino's website at:
http://www.meschinohealth.com/

Additional Readings

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- A Comprehensive Guide to Minerals
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- A Comprehensive Guide to Accessory Nutrients and Fo

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- A Comprehensive Guide to Minerals
- A Comprehensive Guide to Herbs
- A Comprehensive Guide to Accessory Nutrients and Esse