Dynamic Chiropractic

MUSCULOSKELETAL PAIN

Osteoarthritis : A New Paradigm for the Arthrocline

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In the U.S. alone, some 40 million persons, one out of every seven people, suffer from the degenerative joint disease called osteoarthritis (OA). Most of the OA sufferers are over 40. OA is a major cause of chronic, worldwide disability leading to poor quality of life, lost wages and productivity because of sick days, and significant health care expenses. Weight bearing joints like the spine; hips; knees; ankles; and the joints of the hands are commonly affected.

Most sufferers continue to seek partial and temporary relief through nonsteroidal anti-inflammatory drugs (NSAIDs) like aspirin; ibuprofen; Motrin; or pain relievers like Tylenol. Serious side effects of NSAIDS are not limited to gastrointestinal bleeding and ulceration, but also include hypertension; congestive heart failure; edema; and renal failure. Just averaging two aspirin a day from the age of 25 to 64 increases your chances of kidney disease by 900 percent! The bottom line is that each year, 20,000 die and tens of thousands more are hospitalized because of these medications.

However, more and more people have become aware of the ever-growing number of natural alternatives for arthritis that can give relief by supporting true healing, without damaging the stomach, kidneys or liver. No wonder the popularity of these drug-free alternatives has skyrocketed!

Arthritis refers to any inflammation of the joints. In school I was taught there were 55 kinds of arthritis, including rheumatoid; psoriatic; infectious; and gouty. But by far the most common arthritis, that Fred Sanford (of TV's "Sanford and Son") over-dramatized, is the old "wear-and-tear" degenerative joint disease, osteoarthritis, characterized by damage, degeneration and loss of cartilage - the shock-absorbing, gel-like material between joints. Herein, we will focus on natural supplemental supports for maintaining full function joint longevity, the antithesis of osteoarthritis.

Joints that Make Patients Feel "Old" Already

Osteoarthritis often comes on subtly. Common symptoms include morning stiffness; pain; and stiffness with motion after rest, often improving as one warms up, but then worsening with prolonged activity. Eventually, as the joint deteriorates further, the range of motion becomes noticeably less, and a ground glass sound and joint creaks (crepitus) develop. Unlike the inflammatory types of arthritis like rheumatoid arthritis and gout, inwhich the joints appear spongy, red and warm, in OA the joints are generally cooler, with a "bony hard" slight swelling.

What Causes Osteoarthritis?

OA can be divided into two categories, primary and secondary. In primary osteoarthritis, the degenerative process occurs after a person turns 40 or so. There comes a time in middle age when the processes that break down joint structures (catabolism) outpace the process that renews and repairs joint structures (anabolism). When this occurs, our joint health begins to decline, and is referred to by anti-aging specialists as arthrocline. Primary OA is therefore a classic disease of

aging.

Secondary osteoarthritis is associated with macrotrauma from injury or microtrauma from chronic, often minor misalignments or motion aberrations, previous inflammatory joint diseases, or toxic exposures. Such joints tend to become "old" before their time, but the degeneration, though hastened, is believed to be essentially the same. During the arthrocline, the collagen matrix breaks down the cartilage faster than it can be repaired.

A New Paradigm for the Arthrocline

Dr. J. Buckwater, professor of orthopedic surgery at the University of Iowa, states that there is an "overwhelming body of scientific evidence to support the notion that chondrocytes (cartilage cells) have the ability to detect changes in the matrix condition, and to sense altered mechanical stresses within the surrounding matrix."

Yet, scientists also say that there is a big difference in the size of proteoglycan molecules in the cartilage of older people and those with joint problems, as compared to healthy young people.

Therefore, it stands to reason that by employing protocols that support and extend as long as possible the ability of chondrocytes to detect, sense and respond to mechanical stresses even as they do in youth, the basic underlying cause of primary age-related OA is most scientifically and successfully approached.

It is an aid in developing such protocols that the following information is presented.

What Are Your Patients Feeding their Joints?

Although scoffed at by traditional medical opinion until recently, healthy joints depend as much on good nutrition as any other body part. It is always good advice for most of us in the Western world at least, and especially in the U.S., to eat a more plant-based diet. Although individual needs may differ, we generally need a diet rich in fruits; vegetables; beans; whole grains; nuts; seeds; and minimal junk food. Numerous books have been written full of testimonials on how a healthy diet dramatically lowers pain and stiffness, adds energy, and lowers the risk of heart disease, diabetes and cancer. When considering any of the following nutritional products to optimize joint health, please remember your success is much more likely if ingesting a nutrient dense diet, while avoiding sugar and tobacco, and minimizing alcohol and caffeine.

Sometimes elimination diets help with a misdiagnosed OA that is really an allergic or food-sensitivity problem. Some foods trigger attacks. Gout is a well-known example of this. A lesser-known example is arthritis caused by "night shade" vegetables (potatoes, eggplant, peppers, tomatoes, and tobacco). Certain food sensitivities, or allergies, can flare arthritis, especially the autoimmune type, like rheumatoid arthritis. Food elimination diets are often the best approach in such cases, although DHEA, pregnenalone, and fish oil (EPA/DHA) have been used in large doses for such autoimmune joint problems.

Let's briefly review several of the more popular natural approaches related to osteoarthritis and joint aging.

Glucosamine sulfate (GS), along with its "cousin" chondroitin sulfate (CS), was first used to treat creaky bones in horses and dogs. They worked so well that eventually in the late 1980s, humans, mostly in Europe, started taking them. Many doctors reported getting unsolicited testimonials from patients. Naturally, these doctors told other patients to try it. Currently, over five million Americans take glucosamine or chondroitin, and they are now America's top-selling joint

supplements. Glucosamine, synthesized from the amino acid glutamine and glucose, is one of the building blocks of connective tissue. It inhibits the breakdown of cartilage, stimulates cells that make cartilage, and helps hydrate the cartilage between the joints. This helps keep them like young healthy cartilage; i.e., moist, springy, smooth and slippery, so to speak. Specifically, glucosamine acts as the foundation for cartilage compounds that trap, hold and structure water in cartilage known as glycosaminoglycans (GAGs), mucopolysaccharides, and proteoglycans.

Chondroitin sulfate (CS) is composed of derivatives of glucosamine sulfate with attached sugar molecules, found abundantly in joints because CS is the major component of all connective tissue. The seminal event in the turnover and formation of all connective tissues is the synthesis of CS. Dr. Luke Bucci notes: "Aging is associated with decreases in ability to synthesize CS, correlating with increased incidence of the chronic degenerative diseases."

Chondroitin sulfate inhibits enzymes that break down cartilage, stimulates joint renewal and repair, and helps maintain the viscosity of fluids inside joints. CS also inhibits nitric oxide (NO) synthesis. NO, which is produced by cartilage cells (chondrocytes) that are exposed to pro-inflammatory mediators (cytokines), is not good for your joints. NO breaks down cartilage and inhibits new cartilage formation.* As such, chondroitin's utility in primary age-related and secondary trauma-induced degenerative joint and disc disease, along with the common diseases of connective tissue such as bursitis, tendonitis and carpal tunnel syndrome, stands on firm theoretical grounds.

As chondroitin sulfate molecules are 50-300 times larger than GS molecules, and because GS is less expensive and is absorbed 700 percent better than CS, many argue that GS alone should be sufficient. In 1999, three separate human studies by Paveka, Malaise and Henry-Lanois, respectively, were published (*Lit Rheum:* 24:21-3031-42, 49-51), all attesting to chondroitin's efficacy.

Clinical Studies on Glucosamine Sulfate and Joint Health

There are more than three dozen European scientific studies saying the glucosamine and/or chondroitin works. Finally, U.S. scientists have begun studying their safety and effectiveness! The objective of the randomized, double blind, placebo-controlled U.S. study was to test the effects of glucosamine sulfate on the long-term progression of knee osteoarthritis joint structural changes and functional symptoms.

Results of the clinical trial on the effects of glucosamine sulfate were presented recently by lead researcher Karel Pavelka,MD, at the 64th American College of Rheumatology (ACR), and the 35th Association of Rheumatology Health Professionals' annual scientific meetings in Philadelphia. In the three-year, independent clinical trial recently completed, the effects of this glucosamine sulfate formula were studied, with results upheld prior to positive joint health findings. The study was conducted at the Prague Institute of Rheumatology. Results from the study confirmed that GS slowed disease progression and demonstrated significant clinical improvement on joint pain and function as compared to a placebo. This is significant. According to the *European Journal of Rheumatological Inflammation* (13:7-16, 1993) and others, NSAIDs impair glycoaminoglycan production from cartilage-producing cells known as chondrocytes. (In other words, GS reduces pain and protects joint health, whereas NSAIDs reduce joint pain but likely compromise joint health.) Naprosyn, for example, is known to increase the speed of deterioration of the hip joint, necessitating hip replacement surgery sooner then might otherwise be the case.

Cartilage does not have blood vessels. It gets its only nutrition by seepage through the surrounding membrane, a process known as imbibition. Imbibition occurs with joint motion. Such processes and

motions probably make it easier for substances like glucosamine and chondroitin to "work their way there," according to Dr. Lou Lippiello, director of laboratory research for one of the leading manufacturers of GS. "Apparently it doesn't affect normal joints," he added, "It seems to have an affinity for joints that are undergoing some kind of trauma or stress."

Dosage is related to size, and is usually from 1,200 to 2,000 mg for 6-8 weeks. It takes about that long for it to work. If it does not work by then, it likely won't. If it does, the dosage is continued long-term at 400 to 800 mg per day. Anyone who has diabetes or is taking the blood-thinning drug heparin also should be careful. There are a few reports that glucosamine *may* increase insulin resistance and inhibit clotting.

Recent reports show that most name brand products contain the labeled amount of GS, but the quality of that GS varies. Unfortunately, none of the chondroitin products studied contained the amount of chondroitin listed on the label!

Sea Cucumber, Anyone?

Chondroitin-sulfate-rich mucopolysaccharides from the sea cucumber, a marine animal indigenous to Australia's Great Barrier Reef, have a similar reported nutritive action of "moistening" joints. Generally, sea cumber and shark cartilage are "whole food" sources of chondroitin sulfate, which may contain other synergistic nutrients. Shark cartilage became a popular alternative arthritis remedy in the early 1990s. Various indigenous cultures have traditionally used sea cucumber as a remedy for many ailments, including arthritis. Drug companies are trying to synthesize a similar compound for a prescription arthritis medication!

An even more exotic source of GS, CS, and the related type II collagen is velvet deer antler, an extremely common ingredient in Chinese herbal formulas. The middle sections are traditionally used for osteoarthritis and osteoporosis, and are believed to have immune enhancing, anti-stress, endocrine supporting and general anti-aging properties.

The more common "natural" sources of GAGs are the cartilage of common domestic mammals and birds broken down to a rich mucopolysaccharides soup called hydrolyzed cartilage, containing both CS and GS.

MSM to the Rescue?

Methyl-sulfonyl-methane (MSM) is an organic source of sulfur and a relative of DMSO, the infamous solvent liniment used on racehorses with joint pains. Fifteen percent of DMSO, whether taken internally or topically, is converted into MSM. Because sulfur is necessary for the formation of connective tissue, and because MSM is 34 percent organic sulfur, MSM has been widely studied for its use in arthritis and other complications of joint inflammation. Though most of the studies on arthritis have been done on MSM's parent product, DMSO, and anecdotal reports are extremely numerous, actor James Coburn's testimonial on MSM's effects on his rheumatoid arthritis is perhaps the most famous.

Nonetheless, the results of several studies showed that when supplementing with MSM, joint degeneration and inflammation was significantly decreased.[2,3,4] MSM is found in some unprocessed, uncooked foods, especially unpasteurized milk, with small amounts in fruits, vegetables and grains.

Sulfur is the fourth most abundant mineral in the body, after calcium, phosphorus, and magnesium. It is an important component of vital amino acids like methionine and taurine; co-enzymes like thiamin, biotin and coenzyme A; and major antioxidants like glutathione, cysteine and alpha lipoic

acid. Sulfur is vital for healthy skin, nails and hair, and is an essential nutrient for joint tissue, where it functions in the stabilization of the "ground substance," the connective tissue matrix of cartilage, tendons and ligaments. Sulfur is necessary for the production of the disulfide bonds responsible for the rigidity and strength of connective tissue. Sulfur is needed for the body to make chondroitin sulfate!

Sulfur also inhibits the various enzymes that destroy cartilage, like collagenase, elastase, and hyaluronidase. As far back as the 1930s, researchers demonstrated that persons with osteoarthritis (and rheumatoid arthritis for that matter) are commonly deficient in this essential nutrient. As a matter of fact, these decades-old impressions were confirmed recently in patients with rheumatoid arthritis. Of note is that the severity of the RA was directly correlated with the sulfate level in both blood (serum) and joint (synovial) fluids.[5]

CMO: More Initials for Your Arthritis Rx!

A less well-known supplement is cetyl myristoleate (CM, CMO and CM+). CM (cis-9-cetyl-myristoleate) is an oil found in fish and sperm whales; dairy butter; in a small gland in male beavers; and in the blood of a certain species of research mice.

In the mid-1970s, while doing arthritis research for the National Institutes of Health (NIH), Drs. Diel and May discovered cetylmyristoleate. In their studies they learned that Swiss albino mice seemed to be completely immune to arthritis. They found cetyl-myristoleate in the Swiss albino mouse, but not in other common laboratory rats. To follow up on their discovery, they induced rheumatoid arthritis in the mice and rats by injecting them with a well-known bacterium. The results were very revealing in that all of the rats developed arthritis, while the Swiss albino mice displayed no symptoms. They hypothesized that cetylmyristoleate protected the mice from arthritis.

In recent human studies, cetylmyristoleate has proven just as effective when given orally. A double-blind, placebo-controlled multi-center hospital human study with 431 arthritic patients revealed that 63 percent of those who took 18 grams per month (two capsules, 500 mg, yielding 100 mg pure CMO, three times daily) of the cetylmyristoleate formula had an improvement in symptoms.[6] These results were significantly enhanced when the patients applied a CMO cream topically and supplemented with a complementary joint formula containing glucosamine sulfate. An astounding 87 percent of the patients showed improvement when they utilized the three-step cetyl-myristoleate and glucosamine sulfate protocol.

CM and its relatives are long-chain fatty acids that interrupt the inflammatory response in cell walls, including the cell walls of joints. When the long-chain fatty acids in CM become incorporated into the lipid layer of said cell walls, they make such walls much more resistant to a major pro-inflammatory enzyme. This enzyme is a phospholipase that appears early in the inflammatory chain reaction of events, known as a "cascade." CM resists this phospholipase-induced breakdown of the phospholipid layer of cell walls of chondrocytes. Because the pro-inflammatory cycle is thereby resisted so early in its cascade, both subsequent major inflammatory cascades that normally follow are resisted. This is superior to OTC and prescription NSAIDs, which only interrupt one of these two major pro-inflammatory cascades.** And CM does so without any major side effects. Furthermore, because these long-chain fatty acids become part of the cell wall structure, they stay in the body for as long as the cell does, which for cartilage cells can be for years. Therefore, in most cases, one (or sometimes two,) cycles of supplementation are all that is needed to enjoy a long-lasting joint health benefit!

Dr. L. Sanda, a medical researcher at the San Diego Clinic Immunological Center, is a strong

advocate of CM. "Our clinic directed a research study on 48 patients in 1995," she explained. "Several thousand patients have since seen major improvements of 70 to 100 percent in pain and joint mobility. It does so much more than just try to regenerate cartilage as in the so-called 'arthritis cure' book (featuring glucosamine sulfate)."

Nonetheless, to help simultaneously rehydrate joint cartilage, most health professionals who recommend CM also recommend simultaneous glucosamine sulfate supplementation that is continued for at least several months after CM is discontinued.

Antioxidants and the Arthrocline

The "free radical" theory of aging was born in the 1950s. "Free radical" is a term used to describe any molecule that differs from conventional molecules in that it possesses a free electron, a property that makes it react with other molecules in highly volatile and sometimes constructive, but sometimes very destructive ways. When destructive, free radicals can cause extensive bodily damage by triggering a free radical "oxidative" cascade.

This destructive free radical damage begins at birth and continues until we die. In our youth, these effects are relatively minor, since the extensive antioxidant, repair, and replacement (anabolic) mechanisms are at their peak. With age, the accumulated effects of free radical damage begin to show. These include the build-up of waste products inside the cells, called lipofuscin. In the skin, the build-up of these intracellular waste products produces "age spots." (These age spots also occur on our inner organs.) As free radicals attack our skin's collagen and elastin, our joints and cartilage connective tissues are aging as well.

Free radical build-up in joints is thwarted most especially by internally made (endogenous) antioxidants, such as super oxide dismutase (SOD), an enzyme that deactivates (dismutes) the super-oxide free radical.

There are two major sources of antioxidants, endogenous and exogenous, meaning antioxidants we make and antioxidants we get from the outside, i.e., food and supplements. Both are nutrition-dependent in that endogenous antioxidants like albumin, catalase, glutathione (GHS) and trace-mineral-based SOD need a multitude of nutrients such as sulfur, containing amino acids like N-acetylcystiene, or trace minerals like zinc, manganese and selenium

The exogenous antioxidants are many, the more well known being vitamins A; C; E; coenzyme Q-10; and the carotenes and flavonoids. Diets rich in a variety of fruits and vegetables, legumes, and herbs have long been promulgated by alternative healers for many conditions, including osteoarthritis. Perhaps the richness of the antioxidants, their building blocks, and co-enzymes in such a nutritional strategy, explains the abundant testimonials such approaches have historically claimed.

Certainly it is well known that smoking is, a major source of oxidative stress, rough on connective tissues like the skin and spinal discs. Not only will the skin age much more rapidly, so will the spine, resulting in more back pain for smokers than nonsmokers! One reason may be that smoking uses up vitamin C to fight the free radical cascade it causes. But vitamin C is also essential in making connective tissue (via hydroxyproline synthesis).

More Sea Creatures!

Essential fatty acids play a key role in maintaining joint health by promoting the formation of hormone-like compounds called eicosanoids. Eicosanoids are related to prostaglandins. If you recall, NSAIDs work by inhibiting a "bad" pro-inflammatory prostaglandin, PGE-2. Interestingly,

the precursor to PGE-2 is the fatty acid, arachadonic acid, found in abundance in saturated animal fats. Vegetable foods contain polyunsaturated fats (PUFAs).

Two oils known for their utility in natural joint inflammation regulation are evening primrose oil, a rich source of PGE-1 precursors, and EPA/DHA cold water fish oils, the best source of PGE-3 precursors, although flaxseed and perilla oil merit honorable mention here.

A new oil, lyprinol, is actually a "lipid fraction" that has been isolated from the green lipid mussel. It contains no EPAs like fish, but ETAs (eicosate-traenic acids), which display more anti-inflammatory and anti-arthritic activity than any other known PUFA or Omega 3 fatty acid. It is a potent inhibitor of the 5-lipoxygenase pathway as well, according to the authority on the pharmacology of inflammation, W.H. Betts of Queen Elizabeth's Hospital in South Australia. As reported in 1997 by Dr. M.W. Whitehouse in the journal *Inflammopharmacology,* when taken as an oral supplement, lyprinol has been shown to reduce arthritic swelling almost completely.

Is Emu for You?

Some of the newer topical ointment combinations, besides having MSM, glucosamine or CMO, come in an active base of "oil of emu." Emu oil is a natural oil that helps to relieve pain by its natural ability to reduce inflammation. The fat of the emu, a flightless bird resembling an ostrich, contains a high level of linoleic acid, a substance known to ease muscle and joint pain. There as yet is not much peer-reviewed science, but emu oil is building a reputation to work well in relieving discomforts for those who suffer from arthritis. Emu oil-based products are quite popular in the NFL and NBA, and it's even approved by the U.S. Olympic Committee.

SAM-e and Healthy Joints

Most of the body's chemical entities have specific and complex structural requirements that activate, deactivate, or re-program them. One such structure is called a methyl group (CH3-), which has been investigated as a possible supplement for joints challenged with degenerative arthritis. SAM-e (S-adenosylmethionine) is a naturally substance in the body that reacts with folic acid and vitamin B_{12} to produce methyl groups. This process is required by various molecules in the body and in the production of the neurotransmitters dopomine and serotonin. The most compelling evidence for the therapeutic utility of SAM-e, which has possible usefulness in such diverse dysfunctions as depression, fibromyalgia, alzheimer's, atherosclerosis, HIV and MS, is for OA!

SAM-e has analgesic activity, but not through affecting prostaglandin as many of the above-mentioned supplements do. SAM-e may be a pain reliever. Some studies suggest it can significantly increase corticosteroid concentration in the blood. SAM-e does increase proteoglycan synthesis, which supports cartilage growth and repair.

Horse Tail or Horse Feathers?

To review, connective tissue is composed of cells, chondrocytes, which produce the fibrous protein matrix of collagen and elastin, and the hydrated network of amino-sugars called glycosaminoglycans (GAGs) and mucopolysaccharides (MPS). Silicon's primary effect (in connective tissues; bone; tendon; skin; hair; nails; the great vessels of the heart; and cartilage) is on the matrix. Silicon is believed to act as a cross-linking agent that stabilizes the GAG network. Therefore most connective tissue is relatively abundant in silicon, though the healthy human body only contains about seven grams.

A host of OTC silica supplement products for bones; joints; hair; the aorta; skin; and nails can be

found: horsetail; bamboo; algae; colloidal silicon; and silicon enriched yeast. These are not standardized and require strong stomach acids to assimilate the silica. Their utility and bioavailability have not been proven.

Fish and fowl skin; unprocessed grains; rice bran; steel-cut rolled oats (not instant); fibrous vegetables; and mineral waters are our major sources of silica. Beer, made from grains, is a major source and, as silica protects the aorta for plague formation (atherosclerosis), it may be one reason a beer a day is said to offer protection against heart disease!

The use of the mineral silicon is of little value because of its poor absorption and limited biological metabolism. Studies by Calome and Vanden Berghe in 1996 showed that increasing the dietary silicon intake in already well-fed calves by just 4.9 percent in a form of stabilized orthosilicic acid, the form found in human blood, resulted in a 70- percent-higher silicon concentration in serum, and a 12.5-percent increase in skin thickness.

Silicon content decreases with age in animals and humans. This may be related to the declining levels of stomach acid (HCL) needed to absorb silica. It was suggested by Charnot and Peres in 1971 that a decline in hormonal activity may be responsible for the changes in silicon levels in senescence. Though the precise relationship between silicon and the aging process remains to be determined, it is believed that such a relationship is related to glycoaminoglycan changes.

As pertains to primary osteoarthritis, we again see the importance of diet, in this case, unprocessed grains, especially brown rice and oats; mineral water; green "super foods" like algae; fibrous veggies; mineral water; and even a beer now and then. Those patients well into or past middle age with weaker digestion may consider a tablespoon or two of apple cider vinegar or lemon juice in a little water before meals to stimulate stomach acids, or even HCL tablets. If supplementation with glucosamine/chondroitin/MSM/CM fails to restore joint health, it would be the next logical step to consider stabilized orthosilicic acid supplementation, six to 20 mg a day, for eight weeks as a test.

Enzymatic Therapies

Anti-inflammatory enzymes from plant and animal sources have been proven to increase enzyme levels in the blood. Enzymes in the blood are one of the ways your body naturally deals with inflammation. When a joint becomes swollen, it is largely because the fluid in and around the joints becomes infiltrated with protein-rich fluids from the blood called exudates and transudates. These relatively large protein molecules attract water by osmosis and slow or overwhelm the lymphatic drainage system, which leads to a condition of congestion in the joint. By increasing the level of protein digesting enzymes in the blood, these proteins (exudates and transudates) are broken down to smaller molecules, facilitating lymphatic drainage, thereby relieving boggy, swollen and stiff joints. There are many animal and plant-based proteases. Two of the more common plant enzymes are bromelain, from pineapple, and papai,n from papaya.

A recent study looked at the effects of bromelain supplementation and its effects on individuals with musculoskeletal injuries. Treatment with bromelain resulted in a clear reduction of swelling, pain at rest, pain during movement, and tenderness as compared with baseline.[7]

Can Devil's Claw Get a Grip on Your Patients' Arthritis Pain?

Certain herbs are often useful as natural anti-inflammatories for arthritis: tumeric; ginger; boswalia; devil's claw; and white willow bark, the latter being the original source of salicylic acid, more commonly known as aspirin. Several are usually combined in one formula, often with vitamin C, bioflavinoids, manganese and other antioxidant nutrients. For example, a new study from France

suggests that devil's claw *(harpagophytum procumbens)* may be as effective as the prescription drug, diacerhein, for the relief of osteoarthritis pain.

Devil's claw is a South African herb used in Europe to treat joint pain, loss of appetite, and upset stomach. Diacerhein is a newly developed drug that reduces pain and inflammation by exerting its effects slowly and persistently, thereby reducing the need for other pain-relief drugs. Based on their findings, scientists conclude that it is a safe and effective treatment for the relief of osteoarthritis pain.

Please note that devil's claw's most proven effect is to increase stomach acids related to its traditional use for upset stomachs. As lower HCL levels are common after 40, and a strong acid stomach aids proper nutrient digestion, devil's claw may be doubly efficacious for the elderly. However, those with ulcers and gastritis should avoid devil's claw.

Human Growth Hormone and Joint Longevity

Primary OA is the symptomatic expression of a natural process of aging called androcline, said to start when, as part of normal aging, the anabolic processes that renew and rebuild joints are outpaced by processes that break down joint structures. The most important endocrine anabolic hormone that stimulates cartilage growth and repair is human growth hormone. Human growth hormone (Hgh) levels have usually declined dramatically by middle age. This is known as the somatocline. Not unsurprisingly, there are many anecdotal reports from those who have enhanced their Hgh levels in or past middle age, or from their doctors, such that joint functions were much improved. There are admittedly, however, no controlled clinical trials.

In Summation

To delay, or even reverse the structural and functional decline associated with arthrocline, one must facilitate anabolic processes and inhibit catabolic processes. To accomplish this, the following should be considered as part of an overall joint anti-aging program:

1. Support anabolic processes that support cartilage, tendon and ligament renewal and repair by:

    - maintaining moderate activity, enjoying adequate rest, and good nutrition;
    - supplementing glucosamine, chondroitin sulfate and/or MSM; and
    - maintaining the anabolic hormones of youth, specifically growth hormone, which may have a complementary role.

1. Resist catabolic processes by:

    - minimizing oxidative stress via good health habits; and
    - maximizing antioxidant status via dietary and supplemental antioxidants.

1. Optimize internal anti-inflammatory potential by:

    - controlling saturated fat intake; and
    - optimizing omega-3 fatty acid intake.

    Should symptomatic OA already exist, or continue in spite of the above joint nutrition and health program:

- consider natural products that control inflammation that are low in side effects and positively effect joint health, over side-effect-laden NSAIDs, which have long-term negative impact on joint repair mechanisms.

Therefore, one might enjoy a healthy, well-rounded plant-rich diet, especially rich in cold-water fish; wild fowl with skins; and ground flax; pumpkin; walnuts; and omega-3 fatty acid sources. Stretch, stay active, keep warm and get proper rest. Then consider a joint wellness health formula that may feature glucosamine or chondroitin and related mucopolysaccharides, along with MSM; enzymes; herbs; trace minerals; or antioxidant vitamins. True anti-aging enthusiasts may give consideration to adding Hgh secretagogues, or even injections.

It will take one or two months for this program to kick in. If you can find a good source of devil's claw or a natural topical analgesic balm/ointment to relieve pain temporally for the first month or two, by all means - consider it, if necessary.

Those patients already suffering marked OA, or not enjoying a satisfactory restoration of joint health, may want to add various supplemental or topical formulas containing CM; emu oil; SAM-e; lyprinol; niacinamide; glutathione precursors; enzymes; stabilized orthosilicic acid; or herbs internally and externally as needed.

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*Niacinamide, but not niacin, suppresses NO generation. Niacinamide therapy consists of 500 mg, two or three times a day. Antioxidants, especially glutathione, or its precursor N-acetylcysteine, and gamma tocopherol help control NO generation as well.
**There are two major inflammatory cascades associated with joint pain, the cyclo-oxygenase I and II pathway; and the 5-lipoxygenase > leukotriene pathway.

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