Connective Tissue Healing

30% of the internal part of the body and 70% of the skin is composed of Collagen. Collagen gives strength and flexibility to issues and holds them in place. Maintaining the collagen and hyaluronic acid levels in body is the key to beautiful, wrinkle free skin and healthy, flexible pain free joints, tendons and discs. Collagen is also necessary for strong bones and blood vessels.

When you get older the production of collagen, hyaluronic acid and chondroitin sulfate declines and the skin, joints, ligaments, tendons, discs and bones deteriorate. As a result, skin starts to become fragile, less elastic and wrinkles start to set in. Joints can become painful, discs can thin and pinch nerves causing pain, bones become more fragile and subject to breakage. As a result people wanting to alleviate these conditions seek nutritional ways to support the bodies ability to increase production of collagen, hyaluronic acid and chondroitin sulfate.

In my practice of 25 years when the proper diet and supplementation is followed, I've had clients restore disc thickness in 4 months, alleviate lifelong arthritis pain by 99% in 2 months, have wrinkles diminish, have joint flexibility return and feel younger as well.

There are a handful of supplements that when used with a healthy diet free of white sugar, that can support the body's ability to make the connective tissue of the body stronger, more flexible and free of pain.

New Findings show that within 7 months or less it is possible to restore thickness to discs and alleviate the pain in the back or legs caused by pinched nerves.
In a well-referenced article by Ressel,2 clinical and experimental evidence indicates that cartilage damaged by trauma, injury or pathology may heal either with identical tissue or a mixture of fibrocartilage and hyaline cartilage. He states, "Clinical and experimental evidence is overwhelming that the IVD (intervertebral disk) has the capacity to both heal and regenerate. The degree of repair and regeneration of the IVD is greatly dependent on the character of the extracellular 'scaffold,' the available nutrition, the age, and the biomechanical state of the disc material ...ten case studies are presented that clearly demonstrate the possibility of reversing osteoarthritic degeneration of the spine." Before-and-after radiographs of these ten case histories provided evidence of various types of improvement including disk height increases, decreases in osteophyte formation, restoration of the normal cervical curvature and a reduction of disk instability. The time interval necessary for improvement to manifest varied from as little as two months to over seven years, and was dependent on the degree of compliance to a multifaceted regime and the extent of the degeneration, among other things. [1]

1! http://www.meta-ehealth.com/site/office/article.jsp?path=fm_wellness_center/nutrition/nutritional_health_encyclopedia&id=36&category=nutrition

When joints are damaged, it is best to make them immobile to accelerate repair or is it best to keeps joints mobile?

After the joints are fully-grown there is no direct blood supply to the joints. So unlike most other tissues of the body, the only way for nourishment to reach the joints is from synovial fluid. Synovial fluid carries the nutrients and growth factors necessary to cause cartilage and discs to rebuild themselves. Hyaluronic acid is the key nutrient that makes up synovial fluid. Therefore having more hyaluronic acid in the body will support more synovial fluid production.

Additionally movement of the joints and back is necessary for synovial fluid to get into and lubricate these areas. Therefore contrary to previous popular contention that immobility was needed to support joint and disc healing, the opposite is the case. Movement that does not injure the joints or discs is avoided, but as much movement as can be comfortably tolerated is helpful to healing of joints and discs.

Osteoarthritis has the highest morbidity of all illnesses affecting mankind. Osteoarthritis often leaves patients confined to bed or a wheelchair.3 Until recently, osteoarthritis has been looked upon as an irreversible consequence of aging -- the inevitable result of continuous wear and tear on the joints. But with increasing knowledge of the factors contributing to osteoarthritis, these and other beliefs about the disease, and about connective tissue in general, are beginning to change. Indeed, there is some clinical and experimental evidence that suggests the possibility that the degenerative process of osteoarthritis may be stopped and even reversed.2

Another misconception is that conditions of joint degeneration require complete immobilization to support the healing process. On the contrary, continued use and weight bearing may be necessary for articular regeneration.2 Findings from some immobilization studies have been summarized by Navarro and Sutton as follows:

1. Degeneration changes in cartilage appear after ten days of immobilization.
2. There are cumulative degenerative changes from periodic immobilizations as brief as four days in duration at four week intervals.
3. Immobilization (periodic or continuous) over 30 days leads to progressive osteoarthritis.
4. Return to normal use and weight bearing after three weeks of immobilization reverses the effects of immobilization.
5. Excessive mechanical stress after three weeks of immobilization accelerates cartilage degeneration.

Because articular cartilage is an avascular tissue, its chondrocytes do not receive a steady supply of nutrients directly from a capillary bed, as do other tissues. Nutrients must, in effect, be absorbed into the cartilage much like water is absorbed into a sponge. An adequate supply of nutrients surrounding, or "bathing," the collagen must be present for the delivery of the nutrients to the chondrocytes. Alternating compression and decompression of the tissue is what facilitates the delivery. Thus, blending comprehensive nutritional support with proper joint motion and the appropriate weight bearing exercise may serve a

physiologic function necessary for delivery of nutrition to the cartilage and recovery of cartilage tissue integrity. [2]

What is the material that feeds to joints composed of?

Proteoglycans are a key component of the ground substance that helps make up connective tissue. Proteoglycans are large aggregates of mucopolysaccharides, also referred to as glycosaminoglycans (GAGs). The mucopolysaccharides, or GAGs, found in connective tissue are hyaluronate, chondroitin sulfates, keratan sulfates and, to a lesser degree, dermatan sulfates. As suggested by their names, sulfur is a major component of GAGs (except for hyaluronate). The sulfurization of GAGs imparts a high negative charge density. GAGs thus repel each other, causing a space-filling function. The negativity and space allow for great water absorption and retention, which accounts for the high degree of compressibility characteristic of connective tissue. It is the gel-like proteoglycans that give connective tissue its compressional strength and resiliency.1,5

Elastins are highly cross-linked proteins similar to collagens, and are found in connective tissues such as ligaments, skin and large blood vessels. Elastins give various connective tissues rubber band-like elasticity and resiliency. As with collagen, one-third of the amino acid residues are glycine. Elastin is also rich in proline but, unlike collagen, it contains no hydroxylysine and very little hydroxyproline.5[3]

What are the Nutrients involved in connective tissue synthesis?

There are several nutrients that can be added to the diet support the body's improved production of Collagen. I'll start with the most important ones and then mention the remaining ones as well.

Connective tissue is composed of Collagen & Elastin fibers and is made of the amino acids glycine, valine, alanine, arginine, proline and hydroxyproline. Therefore consuming a protein source that will supply the amino acids needed is first and foremost. The two most important protein sources to add to the diet are a liquid collagen supplement called Liquid Biocell and One World Whey. Liquid Biocell is a predigested type 2-collagen supplement with naturally occurring collagen, hyaluronic acid and chondroitin sulfate. Chondroitin sulfate is what gives hardness to the cartilage. The type of collagen found in the human body is type 2. So consuming a type two collagen that is predigested down to 1000 molecular weight is ideal. Most collagen supplements are from 20,000 to 200,000 in their molecular weight. Knox type gelatin has a molecular weight of from 60,000 to 200,000. The smaller the molecular weight the easier it is to digest.

2! http://www.meta-ehealth.com/site/office/article.jsp?path=fm_wellness_center/nutrition/nutritional_health_encyclopedia&id=36&category=nutrition

3! http://www.meta-ehealth.com/site/office/article.jsp?path=fm_wellness_center/nutrition/nutritional_health_encyclopedia&id=36&category=nutrition

Clinical trials show Liquid BioCell improves joints:

- Improves joint mobility and lubrication
- Reduces discomfort
- Promotes healthy cartilage and connective tissue

One World Whey is a complete protein. Its amino acid profile and unheated, undamaged state allow for such efficient absorption that it has better biological value than the egg or any other protein source in nature. It is nature's richest source of the amino acid cysteine. People rave about MSM as a sulfur source yet; Cysteine is a much more readily used source of sulfur as it is an amino acid. The body is constantly needing and using amino acids for protein synthesis. Cysteine being a source of sulfur supports the production of chondroitin sulfates, keratin sulfates and dermatan sulfates that make up the connective tissue. Hence it is a great support for super healthy joints, discs and connective tissue supports the elimination of inflammation in the joints and tissues. Due to the complete amino acid profile of One World Whey and that the Biological Value is better than that of the egg, One World Whey supplies a complete protein source for many repair processes in the body. However the most significant benefit to One World Whey comes from its strongly supportive role of increasing Glutathione Production. Glutathione is the body's number one detoxifier and neutralizer of free radicals. The liver requires large amounts of glutathione to function properly. The liver also is the primary producer of SOD. SOD is the primary antioxidant of the joints. So by improving liver health with higher glutathione production, you are also improving SOD production. This in turn supports the elimination of inflammation in the joints and the rest of the body. One of the most common reports we have from people taking One World Whey is the reduction of joint and muscle pain.

Nicholas Lupo's
One World Whey Testimony

My name is Nick Lupo, One World Whey has been by far the best Whey Protein that I have ever had! I take it three times a day, once in the morning as soon as I wake, once for a pre-workout snack, and once for a post-workout recovery drink. It has helped me transform and sculpt my body into what I have now. I began taking the product about 2 years ago…and boy let me tell you, I am in the best shape of my life! I have seen major lean muscle mass gains and I have 0% body fat. I have had people at my gym ask if I compete in bodybuilding because of how lean and muscular I am. I used to suffer from everyday aches and pains from hard labor my whole life and arthritis that runs in my family, but One World Whey has helped take that everyday pain from a 10 to a 3. Some days I feel no pain at all, just full of life and energy. It has also helped my skin look younger and healthier. Thank you Synergistic Nutrition or One World Whey!

Growth Factors

Growth factors play a vital role in aiding the connective tissue repair of the body. Synergy One is a unique and powerful growth factor formula that supports the bodies increased production of growth factors. Growth factors like IGF-1, testosterone, estrogen and others are supportive of the creation of new tissue throughout the entire body. Client reports over 16 years with Synergy One have been impressive. One often reported benefit is joint, disc and bone health are restored to 100% normal in many people.

Hyaluronic Acid

Hyaluronic acid is a mucopolysaccharide that forms the backbone of proteoglycans and is also a major component of synovial fluid. Sato et al.12 reported that hyaluronic acid and D-glucuronic acid act as free radical scavengers in a dose-dependent manner. They were shown to provide antioxidant protection of synovial tissues in patients with rheumatoid arthritis. This study demonstrated that the free radical scavenger activity was greatest within the synovial fluid. The investigators believe the free radical scavenger ability may be due to the D-glucuronic acid in the hyaluronic acid and not the N-acetyl glucosamine. It appears that healthy synovial fluid contains other antioxidant substances, which may include superoxide dismutase, catalase, peroxidase and other antioxidants such as albumin, flavonoids, alpha-tocopherol, ascorbic acid, polyphenols and tannin.

Vitamin C

Vitamin C, or ascorbic acid, has multiple functions as a coenzyme and cofactor in many of the body's biochemical pathways. As it relates to connective tissue, vitamin C is required for collagen fiber synthesis, a process vital for tissue repair and healing. Specifically, it is involved in the hydroxylation of proline to form hydroxyproline. Research by Schwarz et al. confirms that ascorbic acid acts as a specific inducer of the collagen pathway.14 A deficiency in vitamin C is associated with poor collagen formation and delayed wound healing.15
Vitamin C also functions as an antioxidant. Whereas vitamin E is considered a very important fat-soluble antioxidant, vitamin C is considered a very important water-soluble antioxidant. Additionally, vitamin C is capable of regenerating other antioxidants, especially vitamin E. It does this by reducing vitamin E radicals formed when vitamin E scavenges oxygen free radicals.16

Zinc, copper, manganese for SOD induction

Superoxide dismutase (SOD) is an antioxidant enzyme. There are two forms of SOD: mitochondrial (contained within the mitochondria) and cytosolic (contained within the cytoplasm of the cell). Mitochondrial SOD is induced by manganese, whereas cytosolic SOD is induced by copper and zinc. Copper/zinc SOD (CuZnSOD) and manganese SOD (MnSOD) protect tissues by converting damaging superoxide free radicals into hydrogen peroxide, which is further catabolized by catalase into water and oxygen.

In order for the SOD enzymes to function, there needs to be an adequate dietary supply of copper, zinc and manganese. Research suggests that raising the intake of minerals needed for SOD induction may improve SOD activity.17,18 One study reported a significant increase in MnSOD lymphocyte activity in women who received 15 mg of manganese daily for 119 days, compared to women who received placebos.18

Another study reported increased CuZnSOD activity in rheumatoid arthritis patients who supplemented with copper when compared to control subjects. Patients with rheumatoid arthritis reportedly have lower SOD activity, probably the result of inflammation.17 In this study, which was conducted at Purdue University, 23 rheumatoid arthritis patients were compared to 48 healthy, age-matched controls. Blood samples were assayed for erythrocyte Cu/Zn SOD activity before and after the four-week study. Patients who received 2 mg of supplemental copper daily had increased erythrocyte SOD activity an average of 21%. This increase was highly significant compared to the control group.

Another copper enzyme important to connective tissue is lysyl oxidase, which is involved in the cross-linking of elastin and collagen, a role that is necessary for proper collagen formation and maintenance.19

Bioflavonoids

Bioflavonoids are plant-derived substances with strong antioxidant activity and possible pain-relieving properties. It is believed that bioflavonoids may help to relieve pain by inhibiting prostaglandin cyclooxygenase, lipooxygenase, and phospholipase.20 Additionally, since some prostaglandins are known to induce elastase and other catabolic hydrolases, it is plausible that their suppression may benefit connective tissue.20 Furthermore, bioflavonoids are thought to benefit connective tissue by binding to elastin, preventing its degradation by elastases released as a result of inflammation.21 In addition to this apparent enzyme inhibition, bioflavonoids have demonstrated enzyme activation -- namely that of proline hydroxylase, an enzyme necessary for collagen crosslinking.20 Additional research regarding the biochemistry of bioflavonoids and their therapeutic effects is still required, but the current science looks very promising. There is some clinical experience that supports their effectiveness in safely reducing both pain and inflammation in many cases.

Homeopathy

In addition to nutritional support, another area of natural healing has shown historical benefit for connective tissue repair: Homeopathy. Homeopathy has been used for generations for both acute and chronic injuries. Discovered and catalogued originally by Samuel Hahnemman, homeopathic remedies are believed to provide an "energetic" stimulus to the natural healing qualities of the body. Specific remedies have been used in combination to help relieve pain and speed recovery from acute injury, pain and swelling associated with injury, and even the pain associated with arthritis. Homeopathic ingredients, which have been listed in the USHP (United States Homeopathic Pharmacopoeia) for over a hundred years, have been shown to have a wide variety of therapeutic benefits, especially in acute circumstances such as pain and inflammation.22

A combination remedy containing berberis, cholchicum, rhus tox, spiraea, pendula cortex, salicum acidum and urticae diocia may help reduce pain and inflammation in patients with rheumatic and arthritic disorders, and general muscular discomfort.

Foods

There is a growing body of evidence and research demonstrating the vital role our diet plays in the healing of all types of tissue damage and inflammation. It is wise to reduce foods that are relatively high in arachidonic acid (a nonessential fatty acid found in animal products and peanuts), and increase foods rich in alpha-linolenic acid and its end products (essential fatty acid compounds found in some fresh vegetables, flax and pumpkin seeds, walnuts, cold water ocean fish and specialized supplemental concentrates).

Eating a diet rich in fresh fruits, vegetables, seeds, legumes and whole grains will also help to ensure an abundance of phytochemicals -- natural plant-based chemicals that may promote health and healing.[4]

What are the products you work with that you've had the most success with helping people to heal their joints, discs and connective tissues needs?

The primary supplements are:

Synergy One: 3sprays a.m. and bedtime. Supports increase in growth factors. Growth factors open up cells ability to absorb amino acids. Amino acids entry into cells enables cells to repair.

Liquid Biocell: 2oz – 2x per day. Supports, joint, disc, ligament, tendon and bone repair with specific protein and amino acids for rebuilding. Also supports Hyaluronic acid levels.

One World Whey: 1 scoop; 1-2x per day. Supports overall tissue repair and glutathione production.

Hyaluronic Acid: 1 dropperful 2x per day. Supports hydration of joints, skin and tissues and Synovial Fluid production.

Secondary supplements are:

Baobab Fruit Powder: 1scoop 2x per day. Supplies food derived vitamin C and bioflavonoids. Supports connective tissue synthesis.

Mineral Magic: 1tsp in a.m. in water or juice. Supports copper derived Super Oxide Dismutase (major antioxidant)

Tri Min: 1tab – 3x per day. Supports production of Zinc derived Super Oxide Dismutase (SOD - a major antioxidant) and Mitochondrial SOD with Manganese. Also supports Glutathione

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4! http://www.meta-ehealth.com/site/office/article.jsp?path=fm_wellness_center/nutrition/nutritional_health_encyclopedia&id=36&category=nutrition

production with Selenium. Selenium is needed to make the enzyme that makes Glutathione.