



# THE Original Internist

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CLINT PUBLICATIONS

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# *Nutritional Protocols for Soft-Tissue Injuries and Joint Health*

by: Robert G. Silverman, DC, DACBN, DCBCN, MS, CCN, CNS,  
CSCS, CIISN, CKTP, CES, HHC, SASTM

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When an individual gets injured, the typical treatment response does not include proper supplementation necessary to help the body heal itself. In the times of physiological stress or injury, diet alone may not meet the body's nutritional needs. The use of nutritional supplements in addition to a proper diet creates a physiological environment for healing. Therefore, understanding the role and use of micronutrients can improve the quality of your practice. The following article will talk about micronutrients and how they can promote injury healing.

A continually contracting muscle requires specific nutrients and oxygen. A lack of nutrient supply to a muscle/tendon region will lead to overuse; soft-tissue injuries. Therefore, let's ensure that patients get a healthy nutrient supply to the body through proper diet and supplementation that will assist the body with its natural function and repair processes.

The initial injury stage is called the acute phase, characterized by visual swelling, inflammation, and spasm in the surrounding tissues. Typically, there is limited range of motion and potential loss of function. The objective of nutritional supplements in this phase should be to aid in managing pain, reducing swelling and relaxing tight muscles.

Tissue trauma causes an inflammatory process, which releases certain inflammatory response mediators called cytokines and chemokines. These chemicals release PLA2 and arachidonic acid, which then stimulate prostaglandins and thromboxanes. These hormones signal pain and induce rapid inflammation.

## **Management of the Acute Phase: Reducing Pain, Swelling, and Inflammation**

The typical acute phase lasts for three days. Effective treatment begins immediately with nutritional supplementation. Nutrients to address swelling such as trypsin, chymotrypsin, bromelain (also called proteolytic enzymes) can help aid to reduce pain and inflammation. In fact, it is evidenced that patients experience faster recovery rates with proteolytic enzymes. These enzymes must be consumed on an empty stomach for full effectiveness. Numerous studies conclude that both ginger and turmeric (curcumin) inhibit inflammation by moderating excessive cyclooxygenase and lipoxygenase response. Turmeric stimulates muscle tissue repair and is an NF-kB inhibitor. *Boswellia serrata* has been found to specifically inhibit the powerful pro-inflammatory enzyme, 5-lipoxygenase. The

objective of taking these nutrients is to reduce pain and modulate inflammation.

## **Muscle Tissue Repair**

Calcium and magnesium are excellent additions to assist muscle tissue relaxation; calcium acts via pre-synaptic inhibition at neuromuscular junctions to reduce spasm, while magnesium promotes muscle relaxation. In a typical multivitamin/mineral, calcium to magnesium is taken in a 2:1 ratio. However, for muscle injury, they should be consumed at a 1:2 ratio for purposes of muscle relaxation.

## **Sub-Acute Healing: Repair and Remodeling Phase**

The second phase starts at day four and includes up to approximately eight weeks, during which repair and remodeling of soft tissue takes place.

## **Patient Symptoms**

- Continued joint or muscle pain
- Palpable inflammation surrounding injury may still be present
- Range of motion possibly compromised
- Tissue repair and remodeling have begun

## **Therapeutic Objectives for the Repair/Remodeling Phase**

- Provide reparative nutrients that may help minimize formation of scar tissue
- Aid in connective tissue remodeling
- Reduce risk of re-injury and degeneration
- Initiate soft-tissue (extracellular matrix) support by modulating matrix metalloproteinases
- Continue controlling pain and inflammation

## **Nutritional Protocol for Sub-Acute Healing**

An injured site never achieves the original histologic or mechanical features of a healthy, uninjured tendon with rest alone, but chiropractors can make a real difference in the healing of a tendon. Chiropractic treatment including, low-level laser therapy, exercise, manipulation, and crucial nutritional supplements aid in the healing process. Matrix metalloproteinase (MMP) enzymes are released at the time of injury. Unfortunately, excessive release of MMP's can damage healthy tendon, collagen and connective tissue in the injured area. At this point, with elevated MMP's release, the body goes from an inflammatory process into a degenerative state, accelerating from "itis" to "osis." The goal at this point is to modulate the explosion of these enzymes.

Certain compounds, iso-alpha-acids such as ThiAA, signal inhibition and stimulate positive messages into the cell. Berberine, selenium and folic acid are nutrients that also positively impact MMP's. These nutrients are critical elements in a soft tissue nutritional formula.

Support the growth and construction of connective tissue with the following combined nutrients:

- Glycine, proline, lysine, vitamin C, B6, B5, L-taurine, and silica
- Glucosamine/chondroitin sulfate/MSM should be consumed concurrently as well to aid in joint stability

## **Wellness and Prevention Phase**

The goal in this final phase is to achieve optimal tissue  
*(Continued on next page)*

remodeling to support wellness/prevention, and to reduce the risk of re-injury and degeneration by installing what I call my foundation nutrition:

- Phytomulti: Multivitamin/mineral complex with additional phytonutrients
- Omega-3 Fatty Acids: Aids in the reduction of inflammation (two grams of EPA/DHA)
- Vitamin D: Aids in the healing of sports injuries (2,000 IU and up)
- Probiotics (L-acidophilus and B-lactis): Helps balance immune function (approximately 15 billion live organisms)
- A Phytonutrient Green Drink: To help quench damaging free radicals and contribute to whole body alkalization.

### **Nutritional Protocols for Joint Health**

Joint pain is the leading cause of disability among U.S. adults. 30 percent of U.S. adults report experiencing some type of joint pain in any given 30-day period. 18.1 percent of U.S. men and 23.5 percent of U.S. women less than 60 years old report some type of knee pain. As we all know, 8 out of 10 adults at some point in their lives complain of lower back pain.

A recent innovation in nutrition supplemental medicine has proven to be a breakthrough in maintaining joint health. Research has shown that a combination of undenatured type-II collagen (UC-II®) and tetrahydro-iso-alpha acids (ThiAA) help revitalize joint function and performance.<sup>1-4</sup>

The impact of ADLs on joints may cause localized pain and stiffness, which are hallmark features of pathologic inflammatory disease (osteoarthritis – OA<sup>5</sup>). Studies have shown that micro trauma from everyday use of the joints can lead to significant losses in articular cartilage and glycosaminoglycans<sup>6</sup>. In fact, some studies have shown that many of the cytokines implicated in the onset and progression of OA also appear to regulate the remodeling of normal extracellular matrix (ECM).<sup>7</sup>

Conventional medical wisdom has long held that osteoarthritis results from age-related “wear and tear.” For the first time a team of researchers at Stanford University has demonstrated that this is not true. Their research has shown that a nutritional intervention has been identified to safely regulate the immune system to protect aging/stressed joint tissue from autoimmune attacks.<sup>8</sup>

A team of 25 scientists at Stanford University concluded that the development of osteoarthritis is in great part driven by low-grade inflammatory processes. Specifically, the researchers discovered low grade inflammation launches an orchestrated, powerful attack on the synovial joints via signaling proteins normally used to fight infections. This autoimmune response, they reported, plays a key role in osteoarthritis onset. Fortunately, scientists have discovered a substance called undenatured type II collagen, or UC-II®, that retrains killer T-cells (which destroy target cells) so that they recognize collagen as a harmless substance—preventing the joint damage seen in osteoarthritis.<sup>9</sup>

UC-II® was discovered when a team of scientists at the University of Nebraska found that chicken soup prevented the mobilization of immune system cells to sites of inflammation. Upon further analysis, they found it was not vegetables, but a component of the chicken broth itself that exerted this anti-inflammatory activity. Chicken-derived type II collagen was found to regulate the immune system and prevent the attack of proteins and healthy joint cartilage.<sup>10</sup>

UC-II® has been proven to activate a pathway known as “induced oral tolerance” which teaches the immune system to correctly recognize cartilage proteins as the body’s own tissues instead of foreign microbes. Oral-induced tolerance thus prevents an inflammatory attack, a newly recognized cause of osteoarthritis.<sup>11-12</sup>

UC-II®’s key feature is that it results in “induced-specific oral tolerance.” T-cells are in part, immune system watchdogs, constantly assessing the three-dimensional structure of proteins they encounter in order to distinguish between harmless “self” proteins and potentially deadly “foreign” proteins. If T-cells are exposed in the blood to a new protein structure—such as an unrecognized protein on separated collagen fiber—they react violently and trigger an inflammatory response to destroy what is presumed to be a disease-causing invader.<sup>13-15</sup> However, scientists have learned that it is possible to teach T-cells that the collagen molecule is a friend rather than a foe.

Induced-specific oral tolerance retrains T-cells to ignore collagen fibers when they are encountered in joints. Rich collections of immune tissue located in the lower end of the small intestine (called Peyer’s Patches) act as “training centers” for the immune system. Peyer’s Patches expose T-cells to a vast variety of molecular shapes among the natural components in the food we eat. This desensitizes T-cells to new foods to avoid constant inflammatory or allergic reactions. In other words, this is the area that induces tolerance.<sup>16</sup>

Native collagen introduced into the digestive tract—rather than directly into the bloodstream—can “educate” T-cells to ignore collagen fibers when they are encountered in the joints. In scientific terms, the result is “induced specific oral tolerance.” This oral tolerance to collagen powerfully suppresses joint inflammation, as has been shown in numerous studies. In order to induce tolerance to exposed joint collagen, the orally introduced product must be type II collagen—the same form of collagen found in the cartilage matrix—and must have the exact same three-dimensional structure. Undenatured type II collagen retains its molecular structure, allowing it to induce oral tolerance.<sup>17</sup>

The second key ingredient in revitalizing joint function is tetra-iso-alpha acids (ThiAA). Research has shown that ThiAA modulates kinases to prevent the expression of the NF-kB pathway. This pathway is the signal transducer of inflammation in a cell. In other words, it reduces the level of inflammation.<sup>18</sup>

ThiAA contributes to maintaining joint health by decreasing inducible inflammation (cell production of  
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inflammation at the time of injury). In addition, studies have shown it to reduce swelling of acute inflammation and inhibit bone/cartilage degeneration with chronic inflammation.<sup>19-25</sup>

In a landmark study, the combination of UC-II® and ThiAA was shown to promote joint health, specifically by positively influencing knee extension (knee extension is necessary for daily function and sports activities). Additional findings reveal the combination allowed individuals to exercise for longer periods of time before experiencing joint discomfort and to recover from joint injury faster.<sup>26-27</sup>

Recent breakthrough research at Harvard, Stanford and University of Nebraska confirms the supplemental value of the combination of UC-II® and ThiAA to maintain and revitalize joint function.<sup>28</sup> These results can make a profound impact on joint health.

Based on the numerous research studies conducted, there is a definitive need to augment soft tissue healing by adding proper supplementation because soft tissues do not heal properly by themselves. The three phases of care outlined in this article have been formulated for doctors of chiropractic to follow as a template for soft tissue injuries to ensure proper healing.

In my opinion, soft tissue and joint injury are not two separate units but are intricately related. Maintaining joint health is critical for adults through the lifespan to prevent soft tissue injury during ADL's as well as exercise.

Proper diet, ergonomically sound body movement and nutritional supplements are keys for maintaining soft-tissue and joint health. Without nutritional supplements, the normal aging process of soft-tissue/joints will be exponentially increased.

#### About The Author

Dr. Silverman graduated Magna cum Laude from the University of Bridgeport College of Chiropractic and has a Masters of Science in Human Nutrition. His extensive list of educational accomplishments includes his designations as a certified nutrition specialist, certified clinical nutritionist, certified strength and conditioning specialist, certified Kinesio® taping practitioner, NASM-certified corrective exercise specialist, and a certified sports nutritionist from The International Society of Sports Nutrition. Dr. Silverman is a diplomate with the American Clinical Board of Nutrition and diplomate with the Chiropractic Board of Clinical Nutrition. Dr. Silverman is also HardStyle Kettlebell Certified instructor, a certified RockTape – Fascial Movement Taping (levels 1 & 2) provider, and also a CrossFit Level 1 trainer. He has a full-time successful private practice in White Plains, NY, where he specializes in the treatment of joint pain with innovative, science-based, non-surgical approaches and functional medicine. He is a nationally and internationally known speaker and author, contributing to articles published in Dynamic Chiropractic, JACA, ACA News, Chiropractic Economics, The Original Internist, Holistic Primary Care. Dr. Silverman is also on the advisory board for the Functional Medicine University, a health contributor to Fox News Radio and has appeared on Fox & Friends and CBS News as a health expert. Dr. Silverman is awarded the “2015 Sports Chiropractor of the Year” by the ACA Sports Council. Dr. Silverman can be reached at his office: 914.287.6464; email: info@DrRobertSilverman.com www.DrRobertSilverman.com

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