Focus

Ergonomic Nutrition

By Carol Marleigh Kline, JACA Online *editor*

Robert Silverman, DC, DACBN, DCBCN, MS, says neither ergonomics nor nutrition can bring about the degree of optimal health that an educated "marriage" of the two offers—and he has the clinical outcomes to support his perspective. Dr. Silverman runs a private clinic in White Plains, N.Y., specializing in diagnosing joint pain and soft-tissue management.

Ergonomic Nutrition Basics

Dr. Silverman says that because everything in the body is connected, conditions cannot be treated with a single modality. "Ergonomics—including good posture and proper exercise—really only works well when we make sure the nutrients the body needs to build healthy tissue and repair damaged tissue are provided.

"If a patient practices incorrect ergonomics, we are going to see some breakdown in the body. An emphasis on nutrition helps us slow the resulting breakdown and degeneration.

"If an injury occurs, good nutrition allows us to build tissues and structures back from the inside out at a biochemical level."

Focus on Parts Harms Whole

Dr. Silverman says patients can harm their bodies if they have the wrong goals. Traditional American gym routines increase muscle imbalance, he says, which leads to deconditioning. "First, people have a lot of tight muscles. Being hypertonic, we set ourselves up for weak muscles. Our body dysfunctions are a product of our isolated and incomplete approaches to exercise. Ever since the explosion of interest in weightlifting in the past 30 or 35 years, everyone wants to do muscle isolation movement. This can make a muscle look very good—it creates a lot of hypertrophy." But, he says, that means people focus on body parts, not movement patterns.

"The brain really understands only a few movement patterns per body segment. The lower body has a total of four, including squats and lunges. There are three for the core: stabilization, bends, and twists. And the upper body has four more." He points out that gym equipment and technology have been developed that allow people to focus on sculpting the body, which only reinforces the tendency toward poor movement.

"Before I became a chiropractor, I thought the body was static. Now I know that provocation or functional movement allow us to really see how the patterns are firing in sync.

"To advise patients knowledgeably about the pursuit of good health, we must think of the body as a whole by looking at movement patterns vs. isolated muscles."

Sedentary People Court Injury

"When sedentary people move, they also use established patterns of poor movement. They're sitting at the computer, which is an issue if they're sitting incorrectly. And sedentary bodies aren't prepared to handle sudden physical stress, such as running for the bus in the morning."

Nutrition

"If we don't take care of ourselves," says Dr. Silverman, "we are more susceptible to injuries. What we do nutritionally—biochemically—is important.

"Many factors keep us from getting all the nutrients we need through food alone. There's

widespread soil depletion, in addition to our not eating organic foods. That's a major issue. Another factor is basic nutrition. Did you ever see a high school athlete's diet? Up to 96 percent of primary doctors believe we should emphasize nutrition to treat or manage chronic disease.[1] I believe we need supplementation to significantly improve the level of nutrition overall."[2,3]

Locating Quality Products

"It's important when looking for a multivitamin/multimineral to know which companies are going to offer quality ingredients. I look for:

- GMP, or Good Manufacturing Practice, which relates to the quality system used to manufacture and test drugs and active pharmaceutical ingredients.
- NSF certification, which has to do with food and dietary supplement safety, and quality.
- TGA certification, which relates to Australian/New Zealand quality standards.

"We need to ask questions," he says, "regarding quality. The statement 'exceeds GMP requirements' is meaningless. Look for GMP certification via one of the three authorizing organizations in the USA: the Natural Products Association (NPA), NSF, and the United States Pharmacopeia (USP). They all offer credible testing programs related to quality dietary supplements.

"NSF authored the first and only American National Standards Institute standard for dietary supplements to ensure supplements and their ingredients are not adulterated with contaminants and are labeled accurately.

"As a clinician, it is important to me that I can call my supplement company directly and speak with another clinician or researcher while I'm working to create an individualized program for my patients."

Ingredients

Dr. Silverman says the foundation for good nutrition includes a multivitamin/multimineral, omega-3 fatty acids or fish oils, and vitamin D. He looks for the following in multivitamins/multiminerals: vitamin E, carotenoids, zinc, magnesium, copper, a full complement of B vitamins, and microcrystalline calcium hydroxyapatite (MCHC) for the calcium component. "Most people don't use MCHC for calcium. The literature is pretty clear. Calcium carbonate isn't great. Calcium citrate is slightly better. Calcium citrate has been shown to decrease bone loss. MCHC, however, has been shown to not only prevent bone loss but also promote bone growth." He adds, "You want highly absorbable minerals. You want them essentially chelated because when it comes to minerals, it's not what you eat. It's what gets into the bloodstream and finally makes it to the target tissues."[4-6]

Omega-3 Fatty Acids and More

Dr. Silverman says omega-3s "improve cardiovascular profiles and relieve pain in almost 60 percent of patients with neck and low-back pain."[7]

The Trouble with NSAIDs

"NSAIDs do decrease pain, but you have to take the side effects into account—and they are bad," he says. "They may impair collagen synthesis or joint cartilage synthesis, and they don't allow for muscle hypertrophy. I don't consider them a good choice."

Phase One Treatment Approach: Acute Injury

- Presents with acute muscle or joint pain
- Complains of sprain or injury due to trauma or repetitive motion
- Palpable swelling, congestion, inflammation, spasm in surrounding tissues
- Loss of function

During the first 72 hours, says Dr. Silverman, the injury tears cells open. Cytokines and chemokines mobilize immune cells, PLA2 liberates arachidonic acid, and prostaglandins and thromboxanes are created. These signal pain and induce inflammation.

Therapeutic Objectives for the Acute Phase

- Manage pain
- Reduce excessive swelling
- Relax tight muscles
- Use strategies to restore motion

Acute-Phase Nutrients

Pain/Swelling

Some studies, says Dr. Silverman, "show that patients experience faster recovery rates with proteolytic enzymes,[8] which are trypsin, chymotrypsin, and bromelain. Fish oils (EPA, DHA), which can modulate cytokines, can influence levels of pain. Vitamin C, bioflavonoids, turmeric, ginger, and boswellia are all useful in this phase. It may be important to mention to the patient that elimination of pain is not the goal. Pain is an important part of healing and protection from further injury. The goal is to balance pain by increasing the intake of compounds that the body uses to naturally modulate or control pain severity.

"Numerous studies[9,10] suggest that both ginger and turmeric (curcumin) inhibit inflammation by moderating excessive cyclooxygenase and lipoxygenase response. Boswellia serrata has been found to specifically inhibit the powerful pro-inflammatory enzyme, 5-lipoxygenase."[11]

Muscle Tissue

Dr. Silverman says that calcium and magnesium, which is typically taken in the ratio of 2:1, should be changed to 1:2 of calcium to magnesium for the purposes of muscle relaxation. Calcium may act via pre-synaptic inhibition at neuromuscular junctions. Magnesium promotes muscle relaxation. "We are magnesium-deficient in America," he says.

He also recommends lemon balm, passionflower, and valerian root to promote relaxation. "They are considered safe and effective." Hops can also be used for this purpose.[12]

Phase Two Treatment Approach: Subacute Injury

Healing and Tissue Remodeling: Four Days to Eight Weeks

- Presents 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 Subacute Phase:

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

Tendinopathy in the Subacute Phase: Pathophysiology and Non-operative Treatment

A tendon, says Dr. Silverman, heals in three overlapping phases:

1) Inflammation
2) Repair
3) Remodeling

"The injured site never achieves the original histologic or mechanical features of a healthy, uninjured tendon," he says, but chiropractors can make a real difference in how a tendon heals.

At the time of injury, matrix metalloproteinases (MMPs) are enzymes naturally produced by chondrocytes. "They digest collagen and damage connective tissue. We see the results of this activity in patients' joint pain and muscle injury. Their range of motion will be compromised.

Tissue begins to go into the repair/remodeling phase. The doctor's objective at this point is to initiate extracellular matrix (ECM) support by modulating the effects of MMPs."

As the defining feature of connective tissue, ECM includes the interstitial matrix and the basement membrane. "The ECM is of central importance in helping the chiropractor guide the healing process. Chiropractic treatments and specific nutrients are key."

Dr. Silverman says poor diet and lifestyle choices or injury can trigger cell signals that lead to the overactivated release of MMPs. "Excessive release of MMPs can damage healthy tendon and cartilage tissue. I use proteolytic enzymes to modulate the development of MMPs and help the body create healthy connective tissue."

By the fourth day after injury, he says, the release of MMPs is in high gear. "As opposed to the inflammatory process, the body is going into a degenerative process—from an –itis to an –osis. That's a major problem with the musculoskeletal system—how to modulate MMPs to avoid attacking the collagen, ligaments, and so on. Hops or a selective kinase response modulator can help—as can berberine, selenium, and folic acid."

Certain compounds from hops (iso alpha acids, such as RIAA and THIAA) modulate specific cell messengers in the body called kinases, which function to translate dietary signals. Many exist in the body. The activation of some kinases results in positive messages, but the activation of others produces negative messages. "When we get a signal to a receptor site in a cell, it flips the switch. We want to modulate or shut down the bad signals and promote the good ones. When the bad signals go to the cells, arachidonic acid acts as a key inflammatory intermediate: Pain and degeneration are the result. We need to use selective kinase signaling compounds to knock the volume down on inflammation."

When patients decide to use NSAIDs to fight inflammation instead, he says, it's overkill. "The problem is that all the signals are influenced—the good and the bad."

MMPs are a primary target to address tendinitis and connective tissue disorders. "Matrix metalloproteinase inhibitors may play a supportive role in the treatment of tendinopathy by limiting the MMP-mediated degradation of the extracellular matrix**."**[13]

Nutrients that modulate matrix metalloproteinases:

- THIAA and berberine synergistically modulate MMP-13
- Selenium to address MMP-1 and MMP-2
- Folic acid to affect MMP-9

Dr. Silverman says that B vitamins plus minerals are also useful in this healing phase.

Phase Three Treatment Approach: Wellness

Primary injury is well into remodeling at eight weeks plus

- Continue working with connective tissue repair/remodeling
- Support wellness care
- Maintain foundation nutrition
- Reduce risk of reinjury

Therapeutic Objectives for the Wellness Phase

- Address residual inflammation by improving cellular fatty acid profile
- Achieve optimal tissue integrity
- Offer nutritional support for ongoing wellness
- Focus on tissue integrity by recommending:
  - An excellent multivitamin and mineral formula
  - Improvement of fatty acid profiles (EPA/DHA)
  - Vitamin D

What Patients Need to Know

"Most patients stop chiropractic care when the pain stops. But the healing may not begin until Day 4 or 5. As practitioners, we have to explain

to patients that when the pain is reduced or gone, the healing has just begun. What's the No. 1 reason for injury? Previous injury. Patients stop care too soon. We need to communicate how important it is to continue care until the injured tissues are healed."

Patients, he says, also need neuromuscular re-education. "They should be made aware of the fact that proper posture is part of good health. Patients are always bending over. I'm seeing a lot of upper-cross syndrome in my practice. People hold their heads too far forward. Every inch forward of the natural plumb line adds 20 pounds of abnormal leverage on the cervical spine.

"People develop these bad habits by sitting at the computer or performing their work in an incorrect manner. They may be shutting off their mid- and upper-trapezius regions. With upper-cross, you'll have strain points at the cervico-thoracic region, often at the humeral region, and some TMJ. Training in the elements of proper posture will bring huge dividends in the patient's life."

What Doctors Need to Remember

"A lot of doctors forget the proprioceptors when they begin rehabilitation. A patient may have a strained ankle. Most people don't walk into the clinic on the first day of injury as they should. They come in three weeks later with an ankle strain and a limp. What happened? Compensatory muscle change. Without proper proprioception, these people still have that chip in the brain. They will move incorrectly even after their bodies are structurally normal. The more we educate patients to move properly, eat right, work on creating a healthy lifestyle, and improve nutrition, the more we as chiropractors can be instrumental in helping them achieve wellness." ■

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