

# THE UPLINK

Merging Contemporary Chiropractic Neurology and Nutritional Biochemistry in the Tradition of Applied Kinesiology

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## THE MISSING LINKS IN JOINT PROBLEMS

In this issue of *THE UPLINK* we will probe the nutritional and physiological patterns associated with joint healing. There is presently a fascination with products which contain glucosamine and chondroitin sulfate. Many patients are concerned about arthritis and other joint problems. Many are supplementing with these substances on their own.

As with most nutritional fads, there is some value and much hype associated with chondroitin sulfate and glucosamine. There is also a great lack of knowledge about the underlying metabolic problems which make these substances sometimes useful. Chondroitin sulfate is an essential element in the production of our cartilages. The body *should* be able to produce adequate quantities of chondroitin sulfate for maintenance and repair of our cartilages.

Understanding *why* some people respond to these supplements has far-reaching consequences for these patients' overall health.

Chondroitin sulfate is at the end of the production line for cartilage. Glucosamine is merely a step along the way to cartilage production. Using oral nutrient testing, we are able to pick apart the metabolism of these substances to get to the bottom of the patient's problem, rather than just supply the substances with no concern about why the body would need them in the first place.

The production of chondroitin sulfate and cartilage depends fundamentally on just two factors: 1) adequate glucose metabolism, and 2) adequate sulfate availability. Each is discussed briefly below.

### 1) GLUCOSE METABOLISM

Glucosamine production is dependent on glucose being available in the cell. Making glucose available to the intracellular environment depends on two things: adequate blood sugar, and adequate insulin activity. Maintenance of blood sugar is dependent on adrenal gland activity (fully discussed in the audio-video-notes package "Adrenal Stress Syndrome.") Getting the sugar into the cell depends on proper insulin function which is so commonly abnormal. (See *THE UPLINK* issue #11.)

Once in the cell, glucose must be converted into the polysaccharides, glucosamine and glucuronic acid. These substances are also precursors of hyaluronic acid, the ground substance for cartilage and other connective tissues. Glucuronic acid is an overlooked but, in my opinion, more important substance than glucosamine because it also plays a huge role in liver detoxification. The conversion of glucose on into these polysaccharides is via glycolysis (Embden-Myerhoff pathway) requiring magnesium.

### 2) SULFATE AVAILABILITY

Sulfur is also essential, for obvious reasons, for the production of chondroitin sulfate, and hence, cartilage repair. Sulfate is available in the diet and is also produced as a result of sulfur amino acid metabolism. This starts with methionine, converting down into cysteine, and eventually, requiring molybdenum, into sulfate. You may also supplement with sulfur containing products. (See next page.)

We must ask the question "Why would the body need more sulfur in the first place?" It is possible to have too little sulfur in the diet, for sure. But we must also consider that sulfur containing substances are necessary for five of the ten secondary liver detoxification (conjugation) pathways. (See "Liver Detoxification" audio-video-notes package.) Sulfur is necessary for detoxification of many drugs including NSAIDs and of steroid hormones. So if there is any hormone imbalance, or increased cortisol from stress, this may also deplete sulfur reserves leaving inadequate supplies for the joints. And of course, we must not forget the role of the bowel in overloading the liver with toxicity.

The simple act of supplementing with chondroitin sulfate and glucosamine sulfate may help a patient with joint symptoms, but it overlooks a world of underlying problems that cause the body to respond to these supplements in the first place.

For a complete and thorough discussion of all of the ramifications of these problems, see the "Degeneration Intervention..." audio-video-notes package, which is on special this issue.

■ **SULFUR SOURCES:** There is much hype nowadays about various forms of sulfur supplements: MSM (methylsulfonyl-methane), NAC (N-acetyl cysteine), and others. My personal experience is that just plain old L-cysteine shows as good, if not a better, response to oral nutrient testing than the others. There is more research on the other products, they are more expensive, but the primary role of most of these is to supply sulfur. Based on testing and responses of patients, L-cysteine has become my first (but not only) choice for sulfur supplementation.

Sulfur containing foods include the cruciferous vegetables (broccoli, cauliflower, cabbage, and Brussels sprouts) and anything with a bite such as onions, garlic, radishes, mustard, and tumeric.

■ **COMPLETE CARTILAGE NUTRITION:** Check the following for strengthening a weak muscle:

1. GAGS Product (Such as Chondroitin Sulfate)
2. Cysteine (Met, Mg, B-12, Folic, B-6, Methyl Donors e.g., Betaine, Choline), Mo
3. Glucuronic Acid and Glucosamine - check sugar metabolism: Mg, adrenals, pancreas / insulin, etc.
4. Other Necessary Nutrients: Pantothenic Acid, Niacinamide, Vitamin C, Glutamine, Trace Minerals (Mn, Si, Fe, Cu, Zn)

■ **GREATEST SPORTS MEDICINE BOOK EVER:** The publishing house Human Kinetics has just released *Complementary Sports Medicine* by Dr. Phil Maffetone. ISBN: 0-88011-869-5. This 400 plus page textbook is full of valuable clinical information and is a MUST for every library. Also, it is thoroughly referenced with peer reviewed literature articles making it an excellent reference for interdisciplinary and academic venues. You may order the book through the MAF Group and receive a 10% discount off the \$55 retail price. (877-264-2200)

■ **CHRIS SMITH SEMINAR INFO:** The date and location for Dr. Smith's first USA seminar have been set. It will be in Los Angeles on November 20-21, 1999. Chris' presentation on assessing body chemistry at the ICAK meeting in New Orleans was a highlight of the conference. He will expand on these topics in the seminar. Info: e-mail= [sales@metabolics.co.uk](mailto:sales@metabolics.co.uk).

■ **A WORD ABOUT THIS ISSUE'S TOPIC:** We chose the discussion of cartilage repair for this issue, in part, because we receive so many questions from patients on this subject. The preceding discussions barely scratch the surface of this very important and timely topic. A complete understanding will open your eyes to how and why many patients, and many doctors, go through the degenerative processes of aging, and more importantly, how to intervene in these processes to slow or stop this widespread phenomenon. I hope you will take advantage of the Audio-Video-Notes Package on "Degeneration Intervention" if you haven't previously purchased it or taken one of my seminars on this subject.

■ **THE QUIZ COVERING ISSUES 11-14:** 2 answer multiple choice. (Answers below)

1. (Issue #11) Excess insulin activity is associated with:
  - a) pinching the pancreas VRP causes biceps weakness
  - b) rubbing the pancreas VRP causes biceps weakness
2. (Issue #12) LSASS (Ligament Stretch Adrenal Stress Syndrome) is associated with:
  - a) lowered aldosterone
  - b) excess aldosterone
3. (Issue #13) When rubbing over an area of previous injury causes a weak muscle to become strong, the technique of choice is:
  - a) IRT (Injury Recall Technique)
  - b) NSB (Nociceptor-Stimulation Blocking Technique)
4. (Issue #14) Psychological reversal is associated with:
  - a) pinching the small intestine VRP causes strength
  - b) rubbing the small intestine VRP causes strength

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5. (Issue #13) New terms for the 3 types of muscle testing

- a) Alpha, Beta, and Gamma testing
- b) Type 1, Type 2, and Type 3 testing

QUIZ ANSWERS: 1-a; 2-b; 3-a; 4-a; 5-b