

Special Feature

Disc-Flex: An Interview with Mark Swanson, N.D.



Q: What makes Disc-Flex different from other cartilage support products?

A: The spinal disc is a stabilizing and energy-dissipating joint between the vertebrae. The structure and nutritional requirements of the intervertebral disc (IVD) are unique compared to articular cartilage, such as in the knee or elbow. Disc-Flex was formulated to address the factors that specifically influence disc health for targeted support of spinal cartilage.*

Q: Can you briefly explain the composition of the IVD?

A: Discs are made up of three main components: 1) a thin hyaline cartilage found at the endplates, 2) an outer collagen annulus fibrosus (AF), and 3) a central gelatinous nucleus pulposus (NP). The highly hydrated core of the NP is composed of about 80% collagen type II along with proteoglycans, water, serum proteins, lipids, and other molecules and is believed to be the most important component of IVD for resisting compressive loads. As people age, the rate of collagen and proteoglycan biosynthesis decreases and disc cells begin to dehydrate, affecting the strength and compressive resistance of the spine.

Q: How are the nutritional needs of the IVD different than articular cartilage?

A: The IVD is the largest avascular tissue in the body. The blood supply basically terminates above the cartilaginous end plate. These distant capillaries feed the IVD by nutrient diffusion. The diffusion gradient transports nutrients in and waste/toxins out. The metabolism at the central NP is anaerobic due to very low oxygen concentrations. Compared to other forms of cartilage, it has increased lactic acid content and a low pH. This is a primary reason why disc cartilage degeneration occurs earlier than articular cartilage. It is more of a nutritional challenge to supply and maintain a healthy disc matrix especially as a person ages.

Q: What was your approach for developing Disc-Flex?

A: The first objective was to provide direct support for the biosynthesis and hydration of disc cartilage. This is accomplished with three compounds: chondroitin sulfate, glucosamine and type II collagen. Chondroitin and glucosamine enhance the formation of proteoglycans needed for disc cartilage synthesis and hydration. They also maintain proper activity of metalloproteinases and other enzymes, helping to preserve IVD integrity. In addition to structural support, type II collagen promotes healthy

hydration of cartilage tissue and helps the disc's central core retain water, which, as we've discussed, is important for resisting compressive loads.*

Q: Therefore, Disc-Flex promotes healthy disc cartilage synthesis, hydration and lubrication while protecting from enzymatic breakdown?

A: Yes, all this.

Q: The formula addresses other key factors you describe as being the "critical targets" for successful management of disc health. Can you explain these also?

A: It is critical to target a number of processes which contribute to disc aging as well as loss of strength, cushioning, stability and comfort. To focus on these processes, Disc-Flex is designed to address 1) advanced glycation end product (AGE) metabolism 2) the natural inflammatory response and 3) intervertebral disc calcium metabolism. That is what makes this product so advanced.*

continued on reverse

Pathophysiology of Intervertebral Disc Aging and Degeneration

<u>Process</u>	<u>Event</u>
Diminished Cellular Responses	-alteration of gene expression and apoptosis (programmed cell death)
↓	
Biochemical Processes	-increased catabolic and decreased anabolic activity -AGE accumulation w/ increased collagen cross-linking -lipid peroxidation, prolonged inflammation -loss of proteoglycans, dehydration -diminished nutrient diffusion -impaired cellular synthesis
↓	
End-Plate Changes	-end plate calcification, fragility and microfracture -severely impaired permeability and diffusion -elevated lactate and reduced pH -cell "death" apoptosis -disc thinning, instability, load stresses
↓	
Disc Aging and Degeneration	

Reference: Biyani and Andersson. Low Back Pain: Pathophysiology and Management *J Am Acad Orthop Surg.* 2004; 12: 106-115.

***These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.**

The information contained herein is for informational purposes only and does not establish a doctor-patient relationship. Please be sure to consult your physician before taking this or any other product. Consult your physician for any health problems.

Q: How do AGEs compromise disc health?

A: Glucose serves as a source of nutrition for the IVD and diffuses into the cellular matrix of the disc's nucleus pulposus. AGEs form when excess or unmetabolized glucose binds to proteins. Within the spinal disc, AGEs congregate as highly reactive and dysfunctional anti-nutrients. They down-regulate gene expression and production of proteoglycans and have been shown to promote dehydration, cross-linking of collagen, disc stiffening and narrowing, instability and a prolonged state of low level inflammation. People who smoke or have high blood sugar accumulate the highest levels of AGEs. Not surprising, these groups also have a high rate of disc related back and neck pathology. AGEs, like trans fats, have become a major health concern affecting many major tissues and organs throughout the body.

Q: How does Disc-Flex help to maintain healthy AGE activity?

A: In studies, grape seed, l-carnosine and alpha lipoic acid have been associated with maintaining healthy glycation activity and can help to protect intervertebral discs.*

Q: What is the role of boswellia and devil's claw in this formula?

A: Boswellia exerts powerful effects on the natural inflammatory response. It has a direct antagonistic effect on cytokine production, mainly through its activity on 5-lipoxygenase. Devil's claw is one of the most researched and supported herbs for joint comfort. Several German studies have shown its ability to promote mobility of the lumbar spine as well as comfort of the lower back. Both help provide comfort and relief.*

Q: Another critical factor is calcification within the disc. Is this where vitamin D and vitamin K come in?

A: Yes. Calcification of the cartilage end plate and annulus fibrosus limits the permeability and diffusion of the disc nutrient supply and prevents normal waste removal. This affects disc function and stability and leads to a cascade of other changes in the disc that compromise its integrity. Adequate vitamin K₂ as menaquinone-7 and vitamin D₃ help maintain normal calcium metabolism and uptake into extra-skeletal tissues. These two nutrients are paramount for calcium homeostasis.*

Q: How does Disc-Flex fit into your disc support program?

A: As part of a complete disc support program, I often combine it with Pain Relieve, EPA/DHA essentials and Ester-C & flavonoids. These products offer additional support for back comfort, a healthy inflammatory response, and the strength of cartilage and collagen.*

Q: How does Disc-Flex contribute to long-term spine and disc health?

A: It goes without saying that regular low impact exercise, an alkaline and antioxidant rich diet, glucose control and adequate omega-3 intake are a pre-requisite for healthy disc support. Disc-Flex complements this and provides the spinal health practitioner with newer and more exciting options for managing this challenging area of health care.*

***These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

The information contained herein is for informational purposes only and does not establish a doctor-patient relationship. Please be sure to consult your physician before taking this or any other product. Consult your physician for any health problems.



490 Boston Post Road
Sudbury, MA 01776 USA

PRSR STD
U.S. POSTAGE
PAID
PERMIT #12
INDIANA, PA

*Read our
interview with
Dr. Mark Swanson*



TO ORDER CALL: 800-753-2277
Secure online ordering and
information at www.PureCaps.com