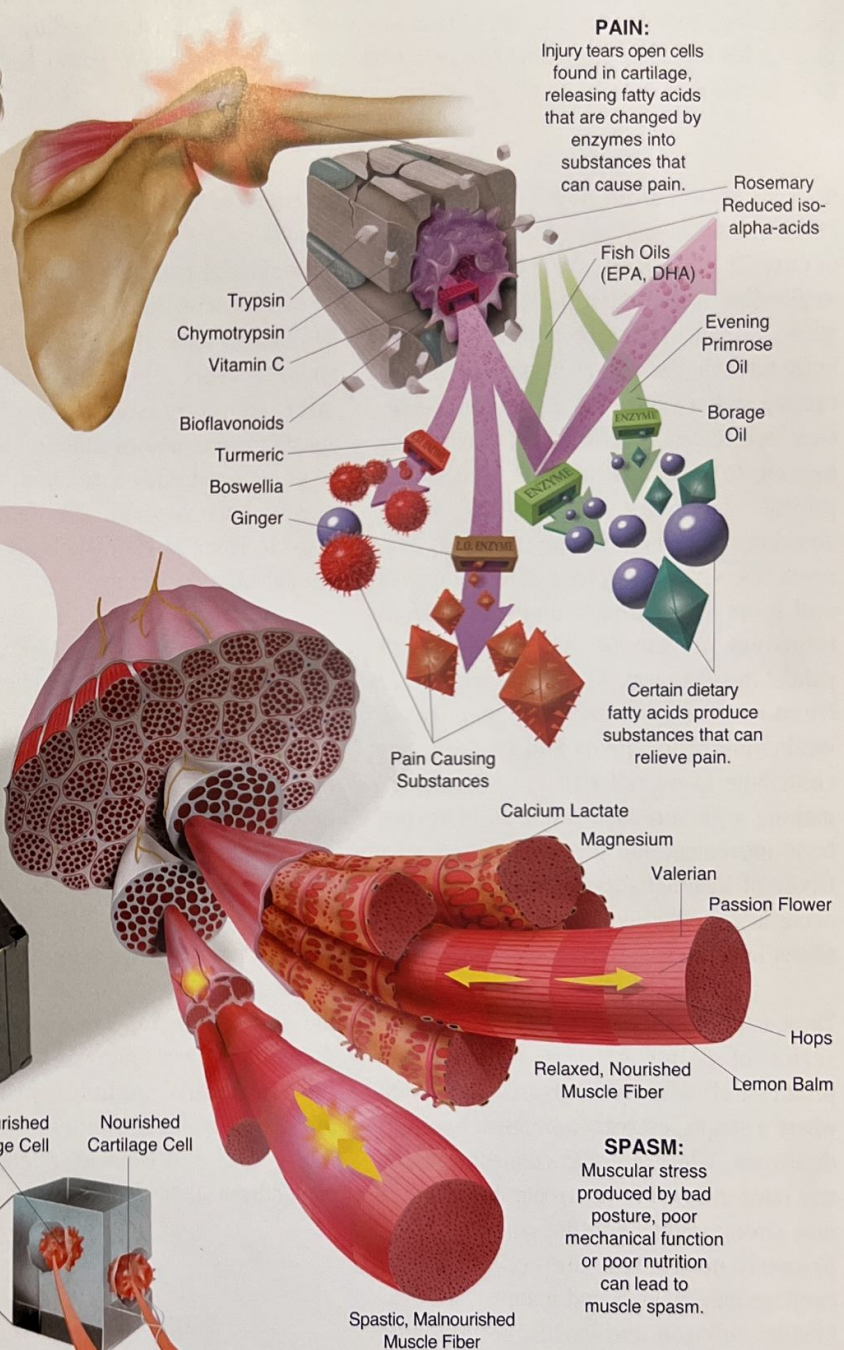
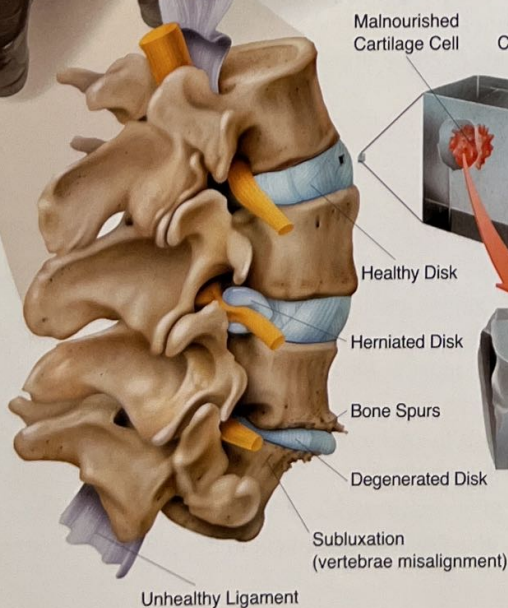


INJURY, SPASM & PAIN



INJURY:
Improper bone alignment, excessive physical stress or unhealthy cartilage can lead to injury.



AVOIDING INJURY, SPASM & PAIN

We have all seen the amazing strength, flexibility, and grace in the body movements of a highly trained gymnast. But we rarely stop to appreciate that this movement is only possible when the bones and muscles work together and are held in place by healthy ligaments, tendons, and cartilage. Without healthy muscle ligaments, tendons, and cartilage, even the simplest everyday movement can result in debilitating pain or injury. Consider the example of the man pictured in the illustration on the other side of this sheet. While bending down to pick up his briefcase, he suddenly experiences excruciating pain in his lower back. What caused this unexpected event? What we learn from this example may help us avoid: Injury, Muscle Spasm, and Pain.

Injury

A close examination of his lower spine reveals a variety of ways that injury may occur: 1) *A herniated disk*: A chronic weakening of the outer sheath of the disk allows the softer center portion of the disk to bulge through, pressing on a spinal nerve and causing severe pain. 2) *A degenerated disk*: Over time the entire structure of the disk has become so weak and thin that it no longer provides the proper separation and shock-absorbing effect between the vertebrae. As a result, the vertebrae develop micro-fractures and bone spurs and are susceptible to improper movement that may result in painful misalignment. 3) *Weakness of spinal ligaments and tendons*: A chronic weakening of ligaments and tendons may contribute to overall structural instability, making a person susceptible to improper bone movement and painful misalignment. Laxity of ligaments and tendons may also occur in any other joint such as the shoulder, elbow, knee, etc.

These injuries may actually result from a long series of painless micro-injuries that progressively weaken the tissue to the point where a simple, everyday movement becomes disastrous. While injury to connective tissue was once believed to be irreparable, there is now strong evidence to the contrary. When properly nourished, the cells found in cartilage may multiply and manufacture new, healthy collagen and cartilage—the major components of all connective tissues.

The degree of repair and regeneration is greatly dependent on a person's biomechanical function. Proper bone alignment, joint movement, and the availability of important nutrients can all be addressed in effective therapy.

Muscle Spasm

Millions of muscle fibers (also called muscle cells) are connected together to form skeletal muscles. A close examination of the muscle fibers, as pictured in the illustration on the other side of this sheet, reveals a graphic enlargement of microscopic muscle fibers. Notice the spastic, malnourished muscle fiber (lower) is contrasted with a relaxed, nourished muscle fiber (upper). The well-nourished muscle fiber is less likely to develop a painful spasm or cramp.

When injured, we may adjust our posture into a position that will help to relieve the pain and compensate for our poor mechanical function. Along with poor muscle nourishment, this may create muscular stress that triggers spasm, cramping and muscle pain. It may also cause a worsening of the original injury and greater pain.

As with connective tissue healing, when dealing with muscle spasm and cramping the degree of therapeutic success is greatly dependent on a person's biomechanical function. This includes proper bone alignment, joint movement, and specific muscle cell nourishment. Effective therapy can address all these concerns.

Pain

Prolonged or excessive pain and inflammation, as well as total elimination of inflammation by drug treatment, may result in delayed healing. The greatest benefit to healing comes when a balance between these two extremes is achieved.

A common and painful shoulder injury, known as "impingement syndrome," is pictured in the illustration on the other side of this sheet. Connective tissue cells are torn open as a bone impinges on a tendon in the shoulder. The cells then release certain fatty acids that are changed by specific enzymes into substances that create pain and inflammation. Inhibiting the action of these enzymes may serve to reduce the excessive production of these pain-causing substances. In addition, certain other dietary fatty acids may lead to the production of substances that relieve pain. Also, the cellular fragments and other debris resulting from the injury must be dissolved or removed to set the stage for healing and repair.

Specific nutrients (indicated on the illustration) may be successfully applied in an effort to accomplish these goals.

Suggestions to Help Avoid Injury, Spasm and Pain

1. Take care to achieve and maintain your body's optimal biomechanical function, focusing on accurate bone alignment and proper joint movement.
2. Nourish your various tissues (cartilage, ligaments, tendons, and muscles) with nutrients that help support their ability to heal and prolong their health and vitality.
3. Exercise regularly, even if it involves only a simple range of motion. Movement is essential to accomplish the delivery of nutrients to—and the removal of waste products from—the cells found in cartilage.
4. Reduce stress as much as possible. (Adequate rest following exercise may help promote thorough delivery of nourishment to the cells of the connective tissues.)