PRESERVING JOINT FUNCTION

Joints are those areas in the body where two or more bones meet. These articular structures or joints are composed of cartilage (connective tissue that covers the joint bones thereby reducing friction), a synovial membrane bathed in lubricating synovial fluid, ligaments and tendons (bands of connective tissue that provide support and control movement), and bursas (fluid-filled sacs that have a cushioning effect). Most of these joints are mobile and thus allow skeletal movement.

Joint pain (arthralgia) may be due to many different conditions. Some of these include arthritis (rheumatoid and osteoarthritis), gout, obesity, lupus and injury. Osteoarthritis, the most common cause of joint pain, is due to a degeneration of joint cartilage. Rheumatoid arthritis is an autoimmune condition that presents with stiff, inflamed joints that are often deformed. Painful, swollen joints greatly limit mobility and can severely impact the quality of life.

Arthritis is the leading cause of disability in America. Data from the Center for Disease Control (CDC) shows that arthritis and other painful joint conditions affect nearly 43 million Americans (1). The most common treatment of joint pain involves the use of non-steroidal anti-inflammatory drugs (NSAIDs). However, the prolonged use of NSAIDs can lead to joint cartilage deterioration, which can contribute to the existing arthritic problem (2).

Several scientific studies have demonstrated the joint supportive and protective actions of certain natural ingredients, including glucosamine, chondroitin and MSM (methylsulfonylmethane). Glucosamine is an amino sugar that stimulates the synthesis of glycosaminoglycans, the major structural component of cartilage. Glucosamine also seems to aid in replenishing joint fluid (3,4). Chondroitin acts by maintaining the structural integrity of connective tissue, including cartilage. Additionally, chondroitin attracts fluid into cartilage, thus making it more shock-absorbent (5). MSM, a natural source of sulfur, is needed for the synthesis and maintenance of cartilage (6).

Additional joint-supportive supplement ingredients include hyaluronic acid and devil’s claw (Harpagophytum procumbens) root. Hyaluronic acid is found abundantly in joint synovial fluid as well as cartilage and plays an important role in joint lubrication (4,5). Devil’s claw root contains iridoid glycosides that appear to reduce inflammation (7). Our current view is that devil’s claw root significantly reduces pain because of its anti-inflammatory activity.

There are a number of herbal extracts that are quite effective in supporting joint health. These include: mangosteen pericarp (Garcinia mangostana), turmeric root (Curcuma
longa), andrographis (*Andrographis paniculata*), white willow bark (*Salix alba*) and boswellia gum (*Boswellia serrata*). When combined in the form of a nutritional supplement, these extracts provide a synergistic modulation of the production of pro-inflammatory prostaglandins and leukotrienes (5).

A relatively new ingredient that shows benefit to inflamed, painful joints is the extract of hops (*Humulus lupulus*) cone. This extract is derived from the flowering part (cone) of the female hops plant and is standardized to 30% alpha acids. These chemically complex alpha acids relieve inflammation and pain in joints because of their powerful antioxidant action as well as a direct and indirect inhibition of prostaglandins and leukotrienes (8,9). These autacoids, specifically prostaglandin E2 and leukotriene B4, are quite efficient in promoting the inflammatory response.

An exciting new aspect of combating joint dysfunction involves the promise of cell-based therapies to regenerate joint cartilage. Cartilage is an unusual tissue in that it lacks nerve cells and blood vessels and contains only one cell type, the chondrocyte. In cases of injury or degenerative disease processes, intrinsic repair of joint cartilage is limited, and degeneration usually continues until joint dysfunction occurs. Therefore, the most logical approach appears to be an initiation of cartilage repair. This was very difficult until the advent of several interesting cell-based techniques (10). One technique focuses on isolating host cartilage cells or chondrocytes, culturing them under laboratory conditions, and then injecting them into the dysfunctional area. Even more recently, a radical approach focuses on mesenchymal stem cells, the progenitors of chondrocytes. The prevailing thought is that these stem cells could effectively become part of the existing cartilage, develop into chondrocytes, and form new tissue. This therapy would be ideal because arthritic degeneration would not just be prevented but rather there would be a reversal of the osteoarthritic disease process.

Many other natural ingredients support and maintain joint health. Omega-3 fatty acids in the form of fish oils and proteolytic enzymes are two of the more important ones.

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REFERENCES:


