

# Technical Bulletin

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## Arthritis, Osteoarthritis, Rheumatoid Arthritis, Bones, Joints and Cartilage Disorders

### According to the Arthritis Foundation:

- One-sixth of the total U.S. population, nearly forty million Americans, have arthritis.
- 80% of people over the age of 50 will experience arthritis in one of its many forms.
- Arthritis is not exclusively a problem of the elderly. It can strike at any time and at any age.
- Under the age of 45, osteoarthritis is much more common in men. At age 55, it makes a dramatic shift, becoming much more common in women.

"Arthritis" has become the catchall term for over one hundred various diseases generally referred to as "rheumatic diseases". The American College of Rheumatologists lists ten categories of rheumatic disease, including:

*ankylosing spondylitis*  
*bursitis*  
*bone and cartilage disorders*  
*gout*  
*fibromyalgia*  
*osteoarthritis*  
*rheumatoid arthritis*  
*gout*  
*tendinitis*  
*systemic lupus erythematosus (SLE)*

"Arthritis" is, in fact, a major symptom of this larger group.

The term arthritis is said to be derived from Greek and means "*inflammation of a joint*." Symptoms include swelling, stiffness, tenderness, redness, loss of joint function, degradation, deformity and pain that have become the hallmark of the "**rheumatic family of diseases**." Movement can be severely impaired and the associated pain can be episodic, unpredictable in duration and can even fade away for an undetermined period of time, only to "flare-up" when least expected.

Over time these continuing "flare-ups" can leave a myriad of problems. The affected joints may become deformed or bent into unnatural positions. Loss of mobility can range from limited to severe, with some joints literally frozen in place. Fleshy nodules can appear under the skin and calcification is common. The whole body can experience fatigue. Eyes may become dry and inflamed, lymph nodes swell, the appetite is reduced, and sores refuse to heal. Compression of nerves and blood vessels can cause pain and vascular insufficiency. Cartilage loses its integrity, causing uneven joints and bone rubbing.

In short, the cumulative effects of arthritis wear on us to the point that we reach for a "quick fix" readily offered by hundreds of commercials and advertisements that claim symptoms and pain can be eliminated by reaching for an ever stronger dose of the most recent arthritis medication.

### Do Prescription Drugs Work to alleviate symptoms and cure Arthritis?

The prognosis is not bright for the long term use of most drugs prescribed by the medical profession for Arthritis. In most cases, their benefit is greatly outweighed by significant toxicity. Their use often produces significant side effects that can only be suppressed with additional drugs.

Dr. Michael Murray, in his book Arthritis, states that "*It is not uncommon for individuals with rheumatoid arthritis to be on 12 or more prescription drugs at one time.*"

Standard treatment recommended for those who suffer from arthritis is estimated to be a \$10 billion-a-year industry in the United States.

*The information in this article is not intended as medical advice, but only as a guide in working with your health care professional.*

### How successful have traditional treatments been?

A group of English Rheumatologists conducted a study from 1964 to 1986 (22 years) of 112 rheumatoid arthritis patients who had received aggressive treatment at a center for rheumatoid diseases in Great Britain.

At the end of the study, "*over one-third of the patients were dead and more than half were either dead or severely disabled.*"

At the ten year mark, participating physicians had been optimistic. The patient's condition and function seemed to improve initially. **After ten years of treatment, however, their condition declined considerably and joint destruction progressed.**

**At the twenty year mark**, nineteen percent of the patients were severely disabled. (*Apparently none of the remaining patients showed any improvement.*)

*The authors concluded that the concept that drugs induce a remission in patients is fallacious.*<sup>7</sup>

### Recent Information Regarding Natural Alternatives

During the past 16 years, many natural alternatives have been employed by those seeking relief from arthritis without long term side effects.

Compare the results of this information to make informed decisions for your personal health.

*This information is not intended as medical advice, but only as a guide when working with your health care practitioner.*

## Pharmaceutical Drugs used in the treatment of Arthritis

The primary drugs used by the medical profession in the treatment of arthritis, particularly rheumatoid and osteoarthritis, are nonsteroidal antiinflammatory drugs (NSAIDS) which include aspirin.

### The most common side effects of NSAIDS is damage to the intestinal tract and NSAID-induced peptic ulcer.<sup>1</sup>

Best selling author, Dr. Michael Murray, in his book *Arthritis*, says, "*The use of NSAIDS are a significant cause of serious gastrointestinal tract reactions, including ulcer hemorrhage and perforation, and lead to as many as 20,000 hospitalizations and 2,600 deaths each year.*"<sup>1</sup>

All **NSAIDS** are recommended for only short periods of time since prolonged use carries the risk of significant side effects.

Most side effects are the result of high doses that must be given in order to suppress the symptoms.

In addition to gastrointestinal distress, **NSAIDS** often cause allergic reactions, easy bleeding and bruising, ringing in the ears, fluid retention, heartburn, indigestion, abdominal cramps, gas, nausea, vomiting, diarrhea, constipation, urinary tract infection, rashes, headaches, depression, dizziness or fatigue, weight gain or loss.

When given in high doses over long periods of time, **NSAIDS** may cause kidney or liver damage.<sup>2</sup>

One serious side effect of aspirin and other **NSAIDS** that is often overlooked is the *inhibition of cartilage repair and acceleration of cartilage destruction.*<sup>3</sup> Some clinical studies have shown that **NSAIDS** are associated with acceleration of osteoarthritis and increased joint destruction. The higher the dose and the longer the use of **NSAIDS**, the greater the joint destruction.<sup>4</sup>

There is increasing evidence that aspirin and other **NSAIDS** appear to suppress the symptoms, but accelerate the progression of osteoarthritis.

***If possible, the use of these drugs should be avoided or severely reduced.***

**NSAIDS** include:

Aspirin  
Fenoprofen (Nalfon)  
Ibuprofen (Motrin, Advil, Nuprin)  
Indomethacin (Indocin, Indometh) Meclofenamate (Meclofen, Meclomen) Naproxen (Naprosyn)  
Piroxicam (Feldene)  
Sulindac (Clinoril)  
Tolmetin (Tolectin)

*Discontinuing any drug should be done gradually over a period of time and under the direction of your health care professional.*

## Natural Alternative Therapies

During the past 16 years, many natural alternatives have been employed by those seeking relief from arthritis without long term side effects.

**The following information is presented to help you become aware of alternative treatments and to act as a guide when working with your Health Care Professional or Advisor.**

### Glucosamine sulfate

More than a dozen controlled clinical trials in Europe and the UK have shown glucosamine sulfate to be as good or better than **NSAIDS** in treating arthritis. The studies report a positive impact on cartilage metabolism without adverse side effects.

Glucosamine is a naturally occurring simple sugar component which is the building block of larger complex sugars called glycosaminoglycans. Glycosaminoglycans form the gel-like ground substance found in connective tissue, mucous secretions and synovial fluid.

Glucosamine sulfate is the preferred form of glucosamine for therapeutic use. It is an effective means of providing glucosamine orally as a building block for the regeneration of cartilage and glycosaminoglycans lost during the progression of osteoarthritis.

**Glucosamine sulfate plays an important role both in preserving the integrity of the tissue and in restoring this integrity after tissue injury, inflammation or degeneration.**

*An open field physician supervised study was carried out in Portugal to assess the effectiveness of oral glucosamine sulfate administered to treat pain associated with arthritis. A total of 1201 patients received 500 mg. of glucosamine sulfate three times a day for 50 days. The results of the study showed that relief from pain, both at rest and during physical activity, improved steadily throughout the treatment period and continued for six to twelve weeks after the supplement was stopped. The clinical improvement was independent of gender, the age of the patient and the location of the arthritis. Oral glucosamine sulfate was well tolerated by 86% of the participating patients.*<sup>8</sup>

*Glucosamine sulfate appears to be one of nature's best remedies for osteoarthritis, addressing the root of the problem plus relieving symptoms.*

### Chondroitin Sulfate

Chondroitin sulfate contains several molecules known as glycosaminoglycans (GAGS) or mucopolysaccharides. Chondroitin is composed of repeating units of glucosamine sulfate with attached sugar molecules. Because chondroitin is a larger molecule, it is often combined with an enzyme such as bromelain to help free its glucosamine and make it more absorbable.

Recent studies have shown that glucosamine sulfate and chondroitin sulfate, two naturally occurring substances normally present in the cartilage of the joints, *out perform standard arthritis drugs in reducing long-term pain, joint tenderness and swelling.*<sup>9</sup>

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### Corticosteroids

These include *cortisone hormones* and *synthetic corticosteroids* like prednisone and methylprednisone.

While the synthetics have less extreme side effects, ***the long term use of synthetic corticosteroids, even at low doses, can cause serious, sometimes life-threatening problems.***

**Side effects include:** the growth of facial hair, acne, fluid retention, weight gain, easy bruising, sleeplessness, muscle wasting and headaches.

**More serious side effects include:**

stomach ulcers, inflammation of the pancreas, and the leaching of calcium from the bones (osteoporosis), which makes fracturing easier.

- These drugs suppress the immune response and, as a result, increase the risk of bacterial infections.
- They can promote narrowing of the blood vessels by fatty deposits and calcification (atherosclerosis).
- They can cause cataracts and glaucoma.<sup>5</sup>
- Some studies indicate that they can suppress the normal functioning of the adrenal glands, suppressing the production of their natural hormones.
- High doses of corticosteroids can spread previously limited infections to all parts of the body and can actually kill the living parts of bone, ultimately causing bone collapse.<sup>6</sup>

### SAARDS & DMARDS

A third class of drugs are known by two names: Slow Acting Anti-Rheumatic Drugs or **SAARDS**, and Disease Modifying Anti-Rheumatic Drugs or **DMARDS**. As the first name implies, these drugs take a long time to begin working, but eventually have an effect. They are used primarily in the treatment of inflammatory kinds of arthritis, especially rheumatoid arthritis, ankylosing spondylitis and arthritis associated with systemic lupus erythematosus.

The first group are *antimalarials* such as chloroquine (Aralen) and hydroxy-chloroquine (Plaquenil).

**Side effects include:** indigestion, nausea, vomiting, headaches, nervousness, diarrhea, abdominal cramps, psoriasis, ringing in the ear and blurred vision.

Because the risk of eye damage is great, most doctors recommend an eye examination every six months.

### D-penicillamine

More than twenty-five percent of people taking D-penicillamine (Cuprimine) quit within the first year due to its unwanted side effects.

**Side effects include:** nausea, vomiting, diarrhea, rashes, kidney damage, blood abnormalities, drug-induced lupus and myasthenia gravis (where muscles gradually become weaker and weaker).

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Chondroitin has also been shown to block or neutralize the enzyme that destroys cartilage. Using chondroitin in combination with glucosamine sulfate may provide synergistic benefits for halting the progression of osteoarthritis.<sup>10</sup>

### Magnesium & Vitamin B<sub>6</sub>

Magnesium activates enzymes that help form new calcium crystals which, in turn, are necessary for vitamin D to convert to an active form. It also is a vital catalyst in enzyme activity, especially the activity of those enzymes involved in energy production. A deficiency of magnesium can interfere with the transmission of nerve and muscle impulses, causing irritability and nervousness.<sup>11</sup>

In addition, magnesium is necessary to prevent the calcification of soft tissue.<sup>12</sup> Recent research indicates that magnesium may help prevent osteoporosis and certain cardiovascular diseases.<sup>13</sup> When magnesium is combined with vitamin B<sub>6</sub> (pyridoxine), it helps reduce and dissolve calcium phosphate and calcium oxalate kidney stones.<sup>14</sup>

Vitamin B<sub>6</sub> effects both physical and mental health. Antidepressants, estrogen therapy, and oral contraceptives increase the need for vitamin B<sub>6</sub>. Cortisone drugs, often used by many arthritis sufferers, block the adsorption of this vitamin by the body.<sup>15</sup>

### Vitamin D

Vitamin D acts to increase the absorption, utilization and transport of calcium, and distributes calcium to the bones and teeth. It is necessary for growth, especially for the normal growth and development of bones.

It is also an important factor in the prevention and treatment of osteoporosis and hypocalcemia, and enhances immunity, thyroid function and normal blood clotting.

Intestinal disorders and liver and gall bladder malfunctions interfere with the absorption of vitamin D. Some cholesterol lowering drugs, antacids, mineral oil and steroid hormones (cortisone) also interfere with the absorption of vitamin D. Supplementation is therefore advised.

### Pantothenic Acid

Probably the least known of the B vitamins is pantothenic acid. It is used by the body's adrenal glands to manufacture steroid hormones. One such hormone, cortisone, is essential in times of physical stress.

Several researchers have pointed out that, because pantothenic acid is essential to the formulation of two important components of connective tissue, a deficiency of the vitamin would lead to a shortage of those substances.

*Why is it possible to have a shortage of this important vitamin that is found in small amounts in most foods?* The answer is simple. In the processing of most of our food, a major part of the pantothenic acid content is stripped away. In processing all purpose white flour, about half of the pantothenic acid content is lost. White rice has also lost half its pantothenic acid through milling. Losses of pantothenic acid in canning green vegetables average about 56%; in canning root vegetables,

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**Anyone taking this drug is advised to have regular blood and urine tests to determine whether they should continue its use.**

### Sulfasalazine

50% of the patients who take sulfasalazine (Azulfidine) develop side effects within the first four (4) months of use.

**Side effects include:** rashes, nausea, vomiting, abdominal pain, headaches and blood and liver abnormalities. Patients are advised to have regular blood and liver tests.

### Gold

The side effects of gold therapy are the reason most people quit taking it.

Almost half of those treated with gold compounds experience diarrhea, indigestion, gas, nausea, abdominal pain, loss of appetite, ulcers in the mouth, rashes, itching, conjunctivitis, kidney problems, blood abnormalities and upper respiratory inflammation. Regular monitoring of blood and kidneys is advised.

### Methotrexate

Methotrexate (Rheumatrex) seems to be the fastest acting of the SAARDS.

**Side effects include:** nausea, loss of appetite, abdominal pain, rashes, anemia, ulcers, headaches, drowsiness, blurred vision, lung damage, fibrosis or cirrhosis of the liver, urinary tract irritation and kidney damage. Regular blood and liver tests are advised.

### Cyclosporin

The majority of people who use cyclosporin (Sandimmune) report decreased kidney function and elevated blood pressure.

**Other side effects include:** headaches, gum swelling, tremors and convulsions. Regular blood and blood pressure tests are advised.

### Azathioprine

Azathioprine (Imuran) is reported to produce slightly more side effects than other SAARDS.

**Side effects include:** nausea, vomiting, diarrhea, bone marrow suppression and hepatitis. Long term use may increase the risk of cancer.

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46%; in canning peas and beans, 78%; in canning fruit juices, 50%. Losses to freezing are around 50% in all vegetables, though only about 7% is lost in fruits and juices (which are already naturally low in pantothenic acid). Losses in cooking any of these foods, run as high as 44%.<sup>16</sup>

How much do we really get in our diet? Most experts think we are getting about 50% of what we need and that additional supplementation is a good idea.

A 1966 study of people with rheumatoid arthritis showed abnormally high levels of pantothenic acid excreted in their urine. Later, studies by British researcher Dr. Annand confirmed that 20 of 26 patients with osteoarthritis showed significant improvement after 14 days of supplementation of pantothenic acid.<sup>17</sup>

### Bromelain

Bromelain refers to a mixture of enzymes found in pineapple. Since its introduction as a medicinal agent in 1957, over two hundred scientific papers about its therapeutic applications have appeared in medical literature.

Various studies report that bromelain exerts a wide variety of beneficial effects, including the reduction of inflammation in cases of rheumatoid arthritis.<sup>18</sup>

Bromelain is a protease-containing enzyme, which may account for its antiinflammatory effects which include the inhibition of pro inflammatory compounds. Bromelain has been shown to prevent swelling by activating compounds that break down fibrin.<sup>19</sup> By decreasing fibrin, bromelain helps promote circulation and posttraumatic resorption of inflammatorily by-products. This allows a speedier recovery time after injury.<sup>20</sup>

Bromelain also blocks the production of kinins.<sup>21</sup> Kinins are compounds produced during inflammation that increase swelling and cause pain.

Bromelain is often combined in formulas with other antiinflammatory ingredients such as *curcumin* to help enhance its absorption.

Conditions in which the clinical efficacy of bromelain has been documented, in addition to arthritis, include angina, bronchitis, athletic injury, bruises, maldigestion, menstrual cramps, pancreatic insufficiency, pneumonia, scleroderma, sinusitis, surgical trauma and thrombophlebitis.<sup>22</sup>

### Yucca (Yucca glauca)

Native American Indians used the root of the yucca as a poultice on breaks and sprains and for rheumatism. Yucca contains a high content of steroid saponins which are precursors to cortisone and provide relief for symptoms of arthritis and rheumatism. Some researchers feel that yucca saponins improve the body's ability to produce its own cortisone by supplying materials needed for the hormone to be manufactured by the adrenal glands. Yucca is naturally rich in vitamin A, B complex vitamins and contains some vitamin C. It is high in calcium, potassium, phosphorus, iron, manganese and copper.<sup>23</sup>

### Alfalfa (Medicago sativa)

### Fennel (Foeniculum vulgare)

### Celery (Apium graveolens).

In many cases of osteoarthritis, plant based remedies can help ad-

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dress the underlying factors responsible for the degeneration.

Some plants that show great promise are those rich in substances known as phytoestrogens. These plant compounds have been shown to be capable of binding to estrogen receptors and cartilage cells, thereby preventing the bindings of the body's own estrogen to the receptor.<sup>24</sup> Since there is a higher incidence of osteoarthritis in women, it suggests that estrogens may play a role in this disease. Further experimental studies have demonstrated that estrogen promotes osteoarthritis.<sup>25</sup> Plants such as alfalfa, celery and fennel are all natural sources of phytoestrogens, and their regular consumption in the diet is encouraged. Other food sources of phytoestrogens include parsley, soy, nuts, whole grains and apples.

In traditional Chinese medicine, fennel is classed as an antispasmodic which helps regulate the chi (vital energy of the body) and remove congestion. In many Indian restaurants, one often finds a bowl of fennel seeds at the cash register. Diners are supposed to chew a few of these seeds to remove the effects of dietary sins, such as overeating, wrong food combining and eating excessive amounts of rich spicy foods. Because of its ability to influence the nerves, it works well as a painkiller.<sup>26</sup>

Alfalfa's antirheumatic effect is probably due to its extremely high nutritive value which includes vitamins A, B, B<sub>6</sub>, B<sub>12</sub>, C, D, E, niacin, pantothenic acid, biotin, folic acid, minerals, proteins, saponins, amino acids, and trace elements. Alfalfa has proven to have a cholesterol lowering effect and it generally helps to improve overall health, vigor and vitality. Due to its saponin content, many believe it has some natural steroid properties. Although the treatment of arthritis is difficult at best, many herbalists feel that the use of alfalfa over the long term could significantly help many people deal with the ailment.

### Hydrangea (*Hydrangea arborecens*)

Hydrangea is a remarkable herb. Its curative properties are second to no other plant. It contains alkaloids that act like cortisone and is noted for its cleansing power. It helps prevent deposits in joints and is rich in minerals to help build joints. It is often recommended by herbalists for arthritis, gout and rheumatism.<sup>27</sup>

### Uva Ursi (*Arctostaphylos uva-ursi*)

Uva ursi leaf is recognized by medical authorities as a diuretic, astringent and antiseptic. It also contains anesthetic properties capable of numbing pain. Today it is often recommended by herbalists as a tonic.

### Cornsilk (*Stigmata maidis*)

Cornsilk has long been used by physicians as a diuretic and for bladder complaints because it has a cleansing effect on urea as it circulates. It has been shown to be a valuable natural remedy in the treatment of renal and cystic inflammations.<sup>28</sup> In China, the herb is also used to treat diabetes and hypertension.<sup>29</sup> In cases where edema is indicated, most herbalists around the world agree that cornsilk directly reduces painful symptoms and swelling due to inflammatory conditions.<sup>30</sup> Some herbalists feel that it may be useful in helping to decrease swelling associated with enlarged prostate.<sup>31</sup>

### Ginger

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Ginger is derived from the plant *Zingiber officinale*. Folk medicine has long touted ginger as an effective aid for proper digestion, and for relief of indigestion and nausea. Now scientists are discovering other potential uses including relief from the pain and inflammation of rheumatoid arthritis. Dr. Krishna C. Srivastva, of the Institute of Odense in Denmark, states that arthritis patients reported "significant relief" from pain after taking less than a tablespoon of ginger every day for three months.<sup>32</sup>

The Medical Tribune (30,18:16) reported one study of arthritis patients who took daily servings of ginger powder. All patients reported that "*they were able to move around better and had less swelling and morning stiffness after eating the spice*".<sup>33</sup>

Oriental Medicine attributes the stiffness, slowness and pain that results from rheumatic conditions to the entrance of cold and dampness in the body, an observation that is not lost to those who suffer from rheumatic symptoms that are intensified by inclement weather. The whole process of the joints losing their lubrication, function and warmth is seen as a "*cooling of the body*", referred to as *atropy* in the West. Ginger is regarded as one of the classic remedies for these conditions and is used internally and externally.

Since ginger has been shown to protect the stomach against damage, it is an excellent ingredient in arthritic formulas to counter stomach problems resulting from the over use of aspirin and other NSAIDS.

### Boswellin

The antiinflammatory phytonutrient. *Boswellia serrata* (Indian Frankincense) is a large, branching deciduous tree that grows in the dry, hilly parts of India. The gum resin of *Boswellia serrata*, known in the vernacular, is "salai guggul", has been used in the Ayurvedic system of medicine for the treatment of rheumatism, respiratory and liver disorders. Boswellin 12<sup>R</sup> is a selectively fractionated principle obtained from the gummy exudate of the tree. In Ayurvedic medicine, the gum is described as being sweet, bitter, hot, antipyretic, antidiarrhetic and is attributed to lowering blood glucose levels.<sup>34</sup> It has also been used to improve appetite and alleviate general weakness and debility.<sup>35</sup> Each tree yields about one kilogram of resin per year.

The major use of this resin in contemporary medicine is as an antiarthritic and antiinflammatory pharmacological agent.<sup>36</sup> The antiinflammatory and antiarthritic properties of the resin are attributed to the presence of B-boswellic acid and other related pentacyclic triterpene acids.<sup>37</sup>

There is positive evidence that boswellic acids reduce the synovial fluid leucocyte count and lower the elevated serum transaminase levels, as well as erythrocyte sedimentation rates.<sup>38</sup> Inflammatory conditions such as rheumatoid arthritis are characterized by a marked increase in the above mentioned parameters. Boswellic acids function as potent antiinflammatory agents in rheumatic conditions, and are especially effective in shrinking inflamed tissues.<sup>39</sup> This action is thought to be mediated through a vascular phenomenon. Boswellic acids improve blood supply to the joints and restore the integrity of blood vessels obliterated by spasm. They may, in turn, also open up collateral blood circulation to provide adequate blood supply to the joints.<sup>40</sup>

One of the most remarkable qualities of boswellic acids is their absence of side effects which are all too often experienced by those who use

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the regularly prescribed **NSAIDS** (Non-Steroidal Anti-Inflammatory Drugs.)

### **Tumeric**

**(Standardized Extract - 95% Curcuma longa)**

Curcuma longa, also known as turmeric (pronounced too-muh-rik), is a member of the ginger family and has been highly esteemed by Indo European people for its golden yellow color and as a culinary spice.

Tumeric, best known as **Haridra** in Sanskrit, has been used in the Ayurvedic system of medicine for tens of centuries as an external tonic for the stomach, a blood purifier, for flatulence (gas) and dyspepsia (indigestion) and urinary tract diseases.<sup>41</sup>

The significance of tumeric in medicine changed considerably when it was discovered to have antioxidant properties due to its naturally occurring phenolic compounds. These phenolic compounds are collectively termed *curcuminoids*, since their principal ingredient is known as curcumin.

Continuing laboratory and clinical research has indicated that these curcuminoids in tumeric have antiinflammatory activity, which is comparable in strength to steroidal drugs and nonsteroidal drugs such as indomethacin and phenylbutazone.<sup>42</sup> In addition, curcuminoids inhibit enzymes (derived from arachidonic acid) which participate in the synthesis of inflammatory substances in the body.<sup>43</sup> Curcuminoids have been shown to prevent the synthesis of several inflammatory prostaglandins and leukotrienes.<sup>44</sup>

When the antiinflammatory properties of curcumin were tested in a double-blind clinical trial in patients with rheumatoid arthritis, curcumin produced *significant improvement in all patients*. The therapeutic effects were comparable to those obtained with phenylbutazone, a prescription drug known for its analgesic and antiinflammatory properties.<sup>45</sup>

### **White Willow Bark**

Though weaker in its activity, white willow bark was the original source of salicin, the forerunner of aspirin. It is mentioned in ancient Egyptian, Assyrian and Greek manuscripts and was used to combat pain and fevers by physicians such as Galen, Hippocrates and Dioscorides.

Interestingly, salicin is converted through oxidation to salicylic acid within the body.<sup>46</sup>

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### **Nutritional and Preventative Therapy**

Nutritional therapy, as opposed to drugs, is the cornerstone of alternative treatment and prevention. The body's biochemistry is complicated (and endlessly fascinating). This is justification for seeking advice from a professional trained in the nutritional sciences and familiar with natural nutritional alternatives.

For best results (in the absence of a complete nutritional analysis), the following program of nutritional supplements is recommended for those seeking to mitigate the symptoms of arthritis or those practicing prevention.

### **Daily Recommendations:**

#### **Wellness Pack PLUS**

**OsteoFlex™\***

**MSM complex**

**Calcium Complex**

**Magnum C**

**ORAC™**

**Liver Enhancer**

**Kidney Enhancer**

**Therapeutica™**

\* OsteoFlex™ is a broadspectrum supplement specially formulated with key nutrients to provide nutritional support for the mitigation of the symptoms of Arthritis.

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*The information in this paper is intended as a reference guide, providing education and information. It is not intended as medical advise or as a guide to self-treatment; nor is it intended to substitute for medical treatment. People with medical questions should consult with a qualified Health Care Professional. Those requiring nutritional information should consult a nutritional professional.*

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