

## Vitamin C and Other Supplements for Reducing the Risk of Gout

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Gout is a form of arthritis that occurs when crystals of uric acid accumulate in a joint, leading to sudden pain and inflammation. Gout occurs more commonly in men (especially in their 40s and 50s), but also in postmenopausal women. People with gout have high blood levels of uric acid. Individuals with gout either overproduce uric acid or are less efficient than other people at eliminating it. The affected joint or joints are usually red, swollen and very tender to the touch. A low-grade fever may also be present. The joint of the big toe is the most common site to accumulate uric acid crystals, although other joints may be affected.

Under normal conditions, uric acid is dissolved in the blood and passes through the kidney and into the urine for elimination. The amount of cumulated uric acid in men is about 1,200 mg and in women, about 600 mg. These values are increased several-fold in individuals with gout. This abnormally high level of uric acid in the blood, called hyperuricemia, may result when a person eats too many high-purine foods (see examples below). Several enzyme systems regulate the metabolism of purines, and a partial deficiency of one or more enzymes may be responsible for the increase in uric acid in these individuals.

### Dietary and Lifestyle Factors

Restricting purine intake can reduce the risk of an attack in people susceptible to gout. Foods high in purines include anchovies, bouillon, brains, broth, consomme, dried legumes, goose, gravy, heart, herring, kidneys, liver, mackerel, meat extracts, mincemeat, mussels, partridge, fish roe, sardines, scallops, shrimp, sweetbreads, baker's yeast, brewer's yeast, and yeast extracts.

Avoiding alcohol, particularly beer, or limiting alcohol intake to one drink per day or less may reduce the number of attacks of gout. Studies have found an increased risk of gout [with alcohol consumption](#). Refined sugars, including sucrose (white table sugar) and fructose (the sugar found in fruit juice), should also be restricted, because they have been reported to raise uric acid levels.

People who are overweight or have high blood pressure are at greater risk of developing gout. However, weight loss should not be rapid because severe restriction of calories can increase uric acid levels temporarily, which may aggravate the condition.

According to a 1950 study of 12 people with gout, eating one-half pound of cherries or drinking an equivalent amount of cherry juice prevented attacks of gout. Black, sweet yellow, and red sour cherries were all effective. Since that study, there have been many anecdotal reports of cherry juice as an effective treatment for the pain and inflammation of gout. The active ingredient in cherry juice remains unknown.

### Vitamin C for Gout

Over the years, studies have shown that vitamin C supplementation can increase the urinary excretion of uric acid and lower blood levels of uric acid. A 1976 human study first showed that 4

grams of vitamin C increased urinary excretion of uric acid within a few hours, and 8 grams per day for several days reduced serum uric acid levels. In 2005, [Huang, et al.](#),<sup>2</sup> showed that 500 mg vitamin C, taken twice per day resulted in significantly lower uric acid blood levels over time.

Most recently (2009), Choi, et al.<sup>1</sup>, showed that vitamin C intake reduced risk of gout in a dose-dependent fashion and that daily vitamin C supplementation at or above 1,000 mg per day was most beneficial in this regard. The study followed almost 47,000 men for 20 years and revealed that compared to men consuming less than 250 mg per day of vitamin C, those who ingested 1,500 mg vitamin C (primarily from supplementation) per day showed a 45 percent reduced risk of gout; those who ingested 1,000-1,499 mg (primarily from supplementation) showed a 34 percent reduced risk of gout; and those who ingested 500-999 mg (primarily from supplementation) showed a 17 percent reduced risk of gout.

#### Other Supplements for Gout

*Chinese skullcap (baicalein)*: The flavonoid baicalein, found in the herb known as the Chinese skullcap, is one of few bioactive agents that has been shown to inhibit the enzyme xanthine oxidase, which is responsible for the conversion of hypoxanthine to xanthine, and xanthine to uric acid, in the pathway for degradation of purines in the body. Thus, baicalein may help to inhibit the buildup of uric acid in the body. The usual doses for therapeutic purposes ranges from 150-200 mg per day of baicalein

*Quercetin*: Experimental evidence demonstrates that the flavonoid known as quercetin inhibits an enzyme (xanthine oxidase - see above) involved in the development of gout. Although human research is lacking, some doctors recommend 150-250 mg of quercetin, three times per day (taken between meals).

*High-potency multivitamin/mineral*: Many vitamins and minerals participate in suppressing inflammatory responses in the body, especially when taken in conjunction with essential fatty acids. However, remember that [high doses of niacin can aggravate gout](#).

*Essential fatty acids*: The combination of borage seed, flaxseed and fish oil provides the body with the raw materials to make the anti-inflammatory hormones ([prostaglandin series-1 and series-3](#)), which are known to reduce joint inflammation in arthritic disorders.

#### A Note Regarding Medical Management

Since many patients may have taken or are currently taking medication for their ailment, it's important to be familiar with the drugs most commonly prescribed to treat gout.<sup>3</sup> [Allopurinol is a xanthine-oxidase inhibitor](#) widely used in the prevention of gout attacks as it blocks the conversion of xanthine to uric acid in purine metabolism. [Uricosuric agents \(probenecid, etc.\)](#) promote the renal excretion of uric acid in the urine and are often used to [prevent tophi formation](#). In many cases, people are predisposed to gout because of insufficient renal excretion of uric acid. Overproduction of uric acid is less common and usually is a result of another disease characterized by rapid cellular replication (e.g., hemolytic anemias, myeloproliferative and lymphoproliferative diseases, psoriasis).

[Colchicine is another drug](#) commonly prescribed to gout patients. One of the effects of colchicine is that it inhibits neutrophil motility and activity, leading to a net anti-inflammatory effect. Finally, drugs such as indomethacin, naproxen, and sulindac (NSAIDs) are the drugs of choice during an acute gout attack. They have fewer side effects than the once popular colchicine. Note that the use

of aspirin and any drugs or supplements containing aspirin (acetylsalicylic acid) or salicylic acid (e.g., white willow extract) are contraindicated, as salicylic acid and N-acetylsalicylic acid compete with uric acid for excretion in the kidney tubules.

In concert with medical management of gout, chiropractors and other health practitioners should consider educating gout-prone patients about dietary and supplementation practices that can help reduce gout incidence and severity of attacks. Most recently, the research by Choi, et al., supports the use of vitamin C supplementation of 1,000-2,000 mg daily as a means to significantly reduce risk of gout in men.

### *References*

1. Choi HK, et al. [Vitamin C intake and risk of gout in men: a prospective study](#). *Archives of Internal Medicine*, 2009;169(5):502-7.
2. Huang HY, et al. [The effects of vitamin C supplementation on serum concentrations of uric acid: results of a randomized controlled trial](#). *Arthritis Rheum*, 2005;52(6):1843-7.
3. Edmunds MW, Mayhew MS. *Pharmacology for the Primary Care Provider, 2<sup>nd</sup> Edition*. Elsevier/Mosby, 2004.

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