

Hyperuricemia, Diet and Gout: Myths vs Facts

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Hyperuricemia

- **Hyperuricemia is variably defined as a serum urate level greater than either 6.8 or 7.0 mg/dl.**
- **Persistent hyperuricemia is a common biochemical abnormality that results from excessive urate production and/or diminished renal uric acid excretion.**
- **Two-thirds or more of hyperuricemic individuals will remain asymptomatic.**

Ref:

1. [Campion EW, Glynn RJ, DeLabry LO. Asymptomatic hyperuricemia. Risks and consequences in the Normative Aging Study. Am J Med 1987; 82:421..](#)
2. [Hall AP, Barry PE, Dawber TR, McNamara PM. Epidemiology of gout and hyperuricemia. A long-term population study. Am J Med 1967; 42:27.](#)

POTENTIAL CONSEQUENCES OF HYPERURICEMIA

- **Gout**
- **Urolithiasis**
- **Chronic interstitial nephropathy (chronic urate nephropathy)**
- **Acute Uric acid nephropathy**







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POTENTIAL CONSEQUENCES OF HYPERURICEMIA

...cont'd

- **Asymptomatic hyperuricemia was formerly regarded as the initial state in the classically defined progression of gout, preceding acute gouty arthritis, intercritical gout, and chronic tophaceous gout**
- **Epidemiologic studies have demonstrated that acute gouty arthritis, uric acid urolithiasis, tophus formation, and chronic urate nephropathy are relatively infrequent occurrences even in individuals with longstanding hyperuricemia .**

Ref:

. [Campion EW, Glynn RJ, DeLabry LO. Asymptomatic hyperuricemia. Risks and consequences in the Normative Aging Study. Am J Med 1987; 82:421..](#)

. [Hall AP, Barry PE, Dawber TR, McNamara PM. Epidemiology of gout and hyperuricemia. A long-term population study. Am J Med 1967; 42:27.](#)

Hyperuricemia and gout

- **There is clear evidence of an association between hyperuricemia and gout.**
- **One study followed serial serum urate concentrations in 2046 initially healthy men for 15 years.**
- **The annual incidence of gout was 4.9, 0.5, and 0.1 percent for serum urate levels of greater than 9.0, 7.0 to 8.9, and less than 7.0 mg/dL, respectively.**

Ref:

Campion EW, Glynn RJ, DeLabry LO. Asymptomatic hyperuricemia. Risks and consequences in the Normative Aging Study. *Am J Med* 1987; 82:421.

Hyperuricemia and goutcont'd

Risk factors for progression of hyperuricemia to acute gouty arthritis include:

- **increased amounts of alcohol consumption (particularly beer and distilled spirits)**
- **high levels of meat and seafood ingestion**
- **diuretic use, and**
- **obesity**

Ref:

[Choi HK, Atkinson K, Karlson EW, et al. Alcohol intake and risk of incident gout in men: a prospective study. Lancet 2004; 363:1277.](#)

[Choi HK, Atkinson K, Karlson EW, et al. Purine-rich foods, dairy and protein intake, and the risk of gout in men. N Engl J Med 2004; 350:1093.](#)

[Lin KC, Lin HY, Chou P. The interaction between uric acid level and other risk factors on the development of gout among asymptomatic hyperuricemic men in a prospective study. J Rheumatol 2000; 27:1501](#)

[Choi HK, Atkinson K, Karlson EW, Curhan G. Obesity, weight change, hypertension, diuretic use, and risk of gout in men: the health professionals follow-up study. Arch Intern Med 2005; 165:742.](#)

Hyperuricemia and Urolithiasis

- **Increasing rates of urinary uric acid excretion are associated with a higher risk of uric acid and calcium oxalate stone formation.**
- **When daily urinary uric acid excretion exceeds 1100 mg (6.5 micromol), the incidence of urolithiasis approaches 50 percent**

[Ref:](#)

[Yü T, Gutman AB. Uric acid nephrolithiasis in gout. Predisposing factors. Ann Intern Med 1967; 67:1133.](#)

Hyperuricemia and Chronic interstitial nephropathy

- **Chronic interstitial nephropathy, mediated by monosodium urate monohydrate crystal deposition in the renal medulla, can occur in severe disease, but is currently considered to be an uncommon clinical manifestation of gout**

Reference:

Khanna D, FitzGerald JD, Khanna PP, Bae S, Singh MK, Neogi N, et al. 2012 American College of Rheumatology guidelines for management of gout. Part 1: systematic nonpharmacologic and pharmacologic therapeutic approaches to hyperuricemia. *Arthritis Care Res (Hoboken)* 2012;64:1431–46.

Hyperuricemia and Acute Uric Acid Nephropathy

- **Acute uric acid nephropathy, in contrast, can occur as part of the tumor lysis and related syndromes in which urate overproduction is the primary abnormality, leading to enhanced urate excretion.**

Ref:

- Rose, BD. Pathophysiology of Renal Disease, 2d ed, McGraw-Hill, New York, 1987, pp. 418-425.
- Kjellstrand CM, Cambell DC 2nd, von Hartitzsch B, Buselmeier TJ. Hyperuricemic acute renal failure. Arch Intern Med 1974; 133:349.

Asymptomatic hyperuricemia: Evaluation

Should prompt appropriate clinical and biochemical evaluation aimed at identifying the following:

- Patients at particularly high risk for gouty arthritis, tophi, or urolithiasis who warrant antihyperuricemic treatment.**
- Individuals whose hyperuricemia is a sign of an underlying disorder or environmental exposure requiring specific treatment.**
- Hyperuricemia-inducing drugs or toxins that can be removed or substituted for, with relief or diminution of the hyperuricemic state.**

Asymptomatic hyperuricemia and renal stone

- **Prophylaxis against renal stone disease is not warranted in most individuals, but therapy should be started after discovery of a stone.**
- **The primary therapeutic modality in this setting is urinary alkalinization with potassium citrate or potassium bicarbonate, not allopurinol.**

Asymptomatic hyperuricemia: Does antihyperuricemic treatment necessary ?

- **Hyperuricemia can be viewed as a necessary (although not usually sufficient) predisposing factor for the narrow range of clinical manifestations of gout.**
- **Antihyperuricemic drug therapy for the great majority of individuals with asymptomatic hyperuricemia is not justifiable by risk/benefit analysis.**

Asymptomatic hyperuricemia: indication of antihyperuricemic treatment

Three specific circumstances warrant at least consideration for the institution of antihyperuricemic treatment in asymptomatic subjects:

- **Persistent hyperuricemia in the infrequent patients with sustained serum urate concentrations greater than 13 mg/dL (773 micromol/L) in men and 10 mg/dL (595 micromol/L) in women.**

Asymptomatic hyperuricemia: indication of antihyperuricemic treatment ...cont'd

- **Excretion of urinary uric acid in excess of 1100 mg (6.5 mmol) daily is associated with a 50 percent risk of uric acid calculi .**
- **Patients about to receive radiotherapy or chemotherapy that is likely to result in extensive tumor cytolysis should be treated to prevent acute uric acid nephropathy and other manifestations of tumor lysis syndrome.**

Diet recommendations for gout

- **Dietary guidelines for patients with gout have changed over time**
- **It is not completely clear which combination of foods is best.**

Diet recommendations for gout

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Avoid	Limit	Encourage	Evidence Grades
Organ meats high in purine content (eg, liver, kidney)	Serving sizes of: <ul style="list-style-type: none">•Beef, Lamb, Pork•Seafood with high purine content (eg, sardines, shellfish)	Low fat or nonfat dairy products	B
High fructose corn syrup-sweetened sodas, other beverages, or foods	<ul style="list-style-type: none">•Servings of naturally sweet fruit juices•Table sugar, sweetened beverages and desserts•Table salt, including in sauces and gravies	Vegetables	C

Reference: Khanna D, FitzGerald JD, Khanna PP, Bae S, Singh MK, Neogi N, et al. 2012 American College of Rheumatology guidelines for management of gout. Part 1: systematic nonpharmacologic and pharmacologic therapeutic approaches to hyperuricemia. Arthritis Care Res (Hoboken) 2012;64:1431-46.

Diet recommendations for gout

....cont'd

Avoid	Limit	Encourage	Evidence Grades
Alcohol overuse in all gout patients	Alcohol (particularly beer, but also wine and spirits) in all gout patients		B
Any alcohol use in gout during periods of frequent attacks, or advanced gout under poor control			C

Reference: Khanna D, FitzGerald JD, Khanna PP, Bae S, Singh MK, Neogi N, et al. 2012 American College of Rheumatology guidelines for management of gout. Part 1: systematic nonpharmacologic and pharmacologic therapeutic approaches to hyperuricemia. Arthritis Care Res (Hoboken) 2012;64:1431–46.

Diet recommendations for gout

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ACR recommendations and other literatures encourage vegetable intake in gout patients, having considered evidence in healthy subjects for lowered serum urate levels and urine urolithiasis risk factors associated with dietary vegetable intake .

However, there was no specific recommendations on the question of avoidance of excess purine intake from vegetables and legumes, in gout patients .

Ref:

- Singh JA, Reddy SG, Kundukulam J. Risk factors for gout and prevention: a systematic review of the literature. *Curr Opin Rheumatol* 2011;23:192–202.
- Zhang Y, Chen C, Choi H, Chaisson C, Hunter D, Niu J, et al. Purine-rich foods intake and recurrent gout attacks. *Ann Rheum Dis* 2012. E-pub ahead of print.
- Tsai YT, Liu JP, Tu YK, Lee MS, Chen PR, Hsu HC, et al. Relationship between dietary patterns and serum uric acid concentrations among ethnic Chinese adults in Taiwan. *Asia Pac J Clin Nutr* 2012;21:263–70

Diet recommendations for gout

...cont'd

- **Changes in diet are often recommended, along with medications.**
- **Making changes in diet without taking a medicine is not likely to make a big difference in blood urate levels;**
- **Following a very strict gout diet only lowers blood urate levels slightly (15 to 20 percent).**

Take home message

- **Two-thirds or more of hyperuricemic individuals will remain asymptomatic.**
- **Antihyperuricemic drug therapy for the great majority of individuals with asymptomatic hyperuricemia is not justifiable by risk/benefit analysis.**
- **Following a very strict gout diet only lowers blood urate levels slightly (15 to 20 percent).**

Take home message ...cont'd

Hyperuricemic patients should cut down on:

- **Red meat and seafood**
- **Beer and hard alcohol, such as gin or vodka**
- **Foods and drinks that have high-fructose corn syrup (that includes most sodas, and store-bought cakes and cookies)**

Instead, should eat lots of:

- **Low-fat dairy products, such as low-fat milk, cheese, and yogurt**
- **Whole grains and vegetables**

Thanks