Ascorbate: Lies, Myths and Half-Truths

Over the years and to this day, ascorbate has been and continues to be the target of many attacks and deprecations from numerous sources. But if examined closely, the common thread running through all these allegations of ascorbate’s “harmfulness” is that they arise out of vested interest. Diverse though they may be, they all have in common a willingness to spread rumors and hearsay to create fear, uncertainty, and doubt about ascorbate. Here they are:

- **Researchers** who know which side their bread is buttered on vis-à-vis research funding. Their careers come to a standstill if they cannot get research grants, usually from drug companies who know the cost-effectiveness of manipulating research outcomes and suppressing results injurious to their profits.
- **Medical practitioners** who cannot deviate too far from orthodox treatments out of fear, from medical review boards and especially malpractice lawyers.
- **Pharmaceutical and medical technology corporations** that have zero to negative interest in preventative health, and are actively hostile to any perceived competition that would cut into their profits or market share. Never mind that their patented medicines are terrifically expensive, are usually toxic and loaded with side-effects: this is about *business*, not health.
- **Publishers and editors** whose livelihoods depend on not antagonizing the entities who submit articles or the advertisers who pay the bills;
- **Assorted fools and buffoons** who are by nature contentious and contrary, and just cannot stand to consider facts at odds with their skewed worldview. They can actually *read* the articles about ascorbate and its benefits, but are compulsively, psychopathically disbelieving of the conclusions. So they dedicate their spare time, which is evidently excessive, tearing down great researchers and clinicians and their discoveries.
• **Wishy-washy, ignorant airheads** who cannot trouble themselves to even discover the facts. Herbalists and wacko remedy peddlers often fall into this category.

The bottom line is that the enemies of ascorbate (and indeed of orthomolecular modalities in general) all are looking after *their* bottom line. Quite simple, really.

The list below summarizes the major lies, myths and half-truths told about ascorbate.

• ascorbate destroys vitamin B\textsubscript{12}
• ascorbate causes kidney stones
• ascorbate causes uric-acid urinary-tract stones and gout
• ascorbate causes DNA damage (leading to cancer)
• ascorbate causes or exacerbates gastric ulcers
• ascorbate causes thrombosis (abnormal internal blood clotting)
• ascorbate causes diabetes
• ascorbate causes rashes, nausea or other gastric upset, abdominal cramps, headaches, fatigue, and diarrhea
• ascorbate interferes with the metabolism of other nutrients (eg. sodium and iron) causing either overload or depletion
• ascorbate interferes with medical tests, such as diabetes, anemia and occult blood-in-stool tests
• ascorbate causes cancer
• ascorbate causes atherosclerosis
• ascorbate is only an antioxidant
• ascorbate is only a vitamin (micronutrient); typical daily diets supply “enough” ascorbate
• an RDA of 60 mg ascorbate/day is adequate
• Intakes in excess of 40/65/200 mg/day are excreted in the urine
• Only humans and primates, guinea pigs, bulbuls and fruit bats need dietary ascorbate
• “Natural Vitamin C” is more effective than the cheaper synthetic form of ascorbate
- ascorbate is worthless against the common cold
- ascorbate is worthless against cancer
- people with G6PD enzyme deficiencies cannot be administered intravenous ascorbate
- ascorbate supplants the immune system by destroying bacteria and viruses that normally generate antibodies

So let us consider in turn each of these misconceptions:

- **Myth: ascorbate destroys vitamin B$_{12}$**

- **Myth/Half-Truth: ascorbate causes kidney stones:** The origins of this myth are not too obscure, but its persistence is a mystery. There is *no conclusive clinical evidence* that high intake of ascorbate is firmly linked to oxalate kidney stones or to large increases in urinary oxalate spillage. For most people, there is simply no significant connection: M.P. Lamden & G.A. Chrystowski (*Proc Soc Exp Biol Med*, 85:1, 190-192, Jan 1954), K. Schmidt et al (*Am J Clin Nutr* 34:3, 305-311, March 1981), F. Erden et al (*Acta Vitamin Enzym* 7:1-2, 123-130, 1985) reported either insignificant or very low increases in urinary oxalate after taking ascorbate.

  There have been scattered, sparsely-reported anecdotes of unusual stone-formers (e.g. M.H. Briggs et al, *Med J Australia* 2:1, 48-49, 7 July 1973) whose urinary oxalate increased unusually when taking large amounts of ascorbic acid, and a few other reports of known stone-formers whose urinary oxalate dropped when ascorbate was stopped (e.g. D.A. Roth et al *J.A.M.A.*, 237:8, 768, 21 Feb 1977). But these patients had a
history of stones before taking ascorbate, and the studies did not rule out contributions of common dietary sources of oxalate (coffee, tea, beans, spinach, oranges etc.). The tenor of most such studies seems alarmist, apparently aimed at creating panic over the “dangers” of ascorbate.

For the rare but unfortunate stone-formers out there, awareness of this biochemical peculiarity and consequent nutritional counseling by a competent practitioner should already be part of day-to-day living. Ascorbate advocates generally recommend that ascorbic acid be avoided, taking instead sodium ascorbate or other mineral-complexed ascorbate. In any case dietary ascorbate is not the biggest problem here.

Complicating matters is that the notion that high-oxalate excretors are necessarily stone-formers (and vice versa) is not borne out clinically, with inconsistencies and contradictions between hypothesis and observation.

On the one hand, there is zero clinical evidence showing that, with people who do not already have a kidney stone problem, ascorbate is even remotely associated with stone formation. On the other hand, soft water, low magnesium, excess sugar, chronic dehydration, and B$_1$ and B$_6$ vitamin deficiencies (L. Hagler et al, Am J Clin Nutr 26:6, 882-889, August 1973; also see Curhan 1999) definitely are associated with stones.

So maybe a lot of researchers have been barking up the wrong tree for way too long. Many people over many years have really wanted ascorbate to be the culprit here, but they just cannot prove a connection. All this obsessing over ascorbate and kidney stones is old news and should stop now.

- Myth: ascorbate causes uric-acid urinary-tract stones and gout
This myth originated with dire speculations issued by H.B. Stein et al (Ann Internal Med 84:4, 385-388, Apr 1976), who grudgingly observed that blood uric acid levels did drop, with increased urinary excretion, after taking 4-8 gram doses of ascorbic acid. But then they warned—without evidence—that predisposed individuals could have problems with ascorbic acid-mobilized uric acid causing gout or renal calculi.

There is just no clinical evidence to support this alarmist myth. As with oxalate kidney stones, there are other dietary considerations, in this case an excess of purine-rich foods, sugars and alcohol, which are clinically far more relevant in uric-acid problems. Another ascorbate-hostile speculation down in flames.

(BTW eating a good quantity of cherries is a widely-known anecdotal but effective folk remedy for gout. Since cherries are not patentable, one does not suppose we will soon see any corporate research into cherries’ active anti-gout substances.)

- **Myth: ascorbate causes DNA damage (leading to cancer)**
  This ludicrous myth was started principally by I.D. Podmore et al (Nature 392:559, 1998) and abetted by S.H. Lee et al (Science 292:2083-2086, 2001). Small doses of 200 mg/day cause cancer! the press blared. This hooey is particularly illogical and unsupportable, for the following reasons*:
    1. **Contradictions in assessing DNA-oxidation effects:** Podmore claimed that 8-oxyguanine (a strong mutagen) was decreased by ascorbate supplementation, whereas 8-oxoadenine (a weak mutagen) was increased. Podmore and the press jumped on the latter increase instead of making the logical conclusion that overall mutagenicity was decreased by ascorbate.
    2. **Epidemiological evidence:** over 100 studies have shown that ascorbate intake is inversely correlated to many cancer types.
3. **Negative contradictory studies**: at least six studies in 2000-2001 disprove any causation between ascorbate intake and DNA damage.

4. **Common sense and animal evidence**: since most animals make their own ascorbate, usually in amounts greater than the alleged “DNA damage threshold”, then animal life on Earth should have long since died of self-inflicted DNA damage. Yeah, right, anyway, the tens of millions of people who have taken multigram doses of ascorbate for years or decades (like me, since 1977 - ed.) are not especially known as walking cancer cases with crisped DNA.

It is amusing but sad that as soon as a new kind of flashy bioassay becomes widely available, some clown will attempt to misuse it to confirm the evils of ascorbate.


- **Myth: ascorbate causes or exacerbates gastric ulcers**
  This myth is inexplicable, with absolutely no clinical studies in evidence to back it up. On the contrary, numerous studies since the 1940s have demonstrated that most ulcer patients needing surgery actually suffer from ascorbate deficiency bordering on scurvy. *More ascorbate, not less!*

- **Myth: ascorbate causes thrombosis (abnormal internal blood clotting)**
  No.

- **Myth: ascorbate causes diabetes**
  No. On the contrary, it can help type I (IDDM) diabetics reduce insulin dosage, and type-II (NIDDM) diabetics manage the condition dietarily.
- **Myth/Half-Truth: ascorbate causes rashes, nausea or other gastric upset, abdominal cramps, headaches, fatigue, and diarrhea.**

  There have been no systematic studies addressing the side-effects of oral ascorbate intakes, excessive or otherwise. Most comments about side-effects or patient discomfort are made in passing, with little recording or formal presentation of findings. Such reports must then be termed anecdotal, a class of communication sneeringly dismissed by ascorbate’s detractors when considering positive ascorbate therapies. But to consider the so-called ascorbate side-effects:

  1. **Rashes, nausea**: ascorbate preparations, both oral and injectable, have historically contained sulfites as preservatives. Many people are known to be sulfite-sensitive, with symptoms like these. Most modern preparations are more stable and need no preservatives. Next...

  2. **“Gastric upset”**: rather unspecified here, hm? Next...

  3. **Abdominal cramps**: which quadrant? Accompanied by belching or flatulence? What was the ascorbate taken with food? Was the patient tested for allergies to same? Was patient anxious? Any details? No? Next...

  4. **Headaches, fatigue**: maybe sulfites again, but all unspecified in any case. Did patient have a history of these complaints? Next...

  5. **Diarrhea**: finally a hit. “Large” doses of ascorbic acid can cause loose bowels. But biochemical individuality, stress and illness make it impossible to define “large”. Five grams might cause loose bowels in a healthy 20-year old athlete, but a 50-gram dose might have no bowel effects whatsoever in a 60-year old cancer patient who has been taking such doses for months.

  NB the acidic form of ascorbate, ascorbic acid, tends to cause bowel effects more readily than the sodium ascorbate or other reacted ascorbates. Parenteral (such as
intravenous) sodium ascorbate is not observed to cause bowel effects.

Also, increased urination (diuresis) is sometimes observed large oral doses. No biggie.

**Lie:** An intentional false statement; an untruth serving a personal or vested interest.

**Myth:** a widely-held story which is false. Also, a persistent assertion with no supporting evidence or based on speculation, disproven or discredited evidence; often untraceable to its origin.

**Half-Truth:** lie based on the intentional or inadvertent omission of certain established facts.

**VITAMIN C does not cause Kidney stones**

“The relation between the intake of vitamins B6 and C and the risk of symptomatic kidney stones were prospectively studied in a cohort of 85,557 women with no history of kidney stones. . . Large doses of vitamin B6 may reduce the risk of kidney stone formation in women. Routine restriction of vitamin C to prevent stone formation appears unwarranted."


**VITAMIN C Safety study**

“Ascorbic Acid is a generally recognized as safe (GRAS) substance . . . mice given Ascorbic Acid subcutaneous and intravenous daily doses (500 to 1000 mg/kg bw) for 7 days had no changes in appetite, weight gain, and general behavior; and histological examination of various organs showed no changes. Ascorbic Acid was a photo-protectant when applied to mice and pig skin before exposure to
ultraviolet (UV) radiation. . . . Pregnant mice and rats were given daily oral doses of Ascorbic Acid up to 1000 mg/kg bw with no indications of adult-toxic, teratogenic, or fetotoxic effects. Ascorbic Acid and Sodium Ascorbate were not genotoxic in several bacterial and mammalian test systems, consistent with the antioxidant properties of these chemicals. . . . These data coupled with an absence of reports in the clinical literature of Ascorbic Acid sensitization strongly support the safety of these ingredients."

(Elmore AR. Final report of the safety assessment of L-Ascorbic Acid, Calcium Ascorbate, Magnesium Ascorbate, Magnesium Ascorbyl Phosphate, Sodium Ascorbate, and Sodium Ascorbyl Phosphate as used in cosmetics. Int J Toxicol. 2005;24 Suppl 2:51-111.)

VITAMIN C prevents and cures Rectal Polyps


Cardiovascular disease decreased by VITAMIN C

“There was a 27% decreased prevalence of coronary heart disease and a 26% decreased prevalence of stroke among those in the highest serum vitamin C category. In the NHANES I Epidemiologic Follow-up Study, it was found that the highest intakes of vitamin C had a 25% to 50% reduction in cardiovascular mortality.”

Role of Vitamin C in preventing and dissolving Kidney Stones: The very common calcium phosphate stone can only exist in a urinary tract that is not acidic. Ascorbic acid (vitamin C’s most
common form) acidifies the urine, thereby dissolving phosphate stones and preventing their formation.

Acidic urine will also dissolve magnesium ammonium phosphate stones, which would otherwise require surgical removal. These are the same struvite stones associated with urinary tract infections. Both the infection and the stone are easily cured with vitamin C in large doses. BOTH are virtually 100% preventable with daily consumption of much-greater-than-RDA amounts of ascorbic acid. Think grams, not milligrams! A gorilla gets about 4,000 mg of vitamin C a day in its natural diet. The US RDA for humans is only 60 mg. someone is wrong, and I do not think it is the gorillas.

The common calcium oxalate stone can form in acidic urine whether one takes vitamin C or not. However, if a person gets adequate quantities of B-complex vitamins and magnesium, this type of stone does not form. Any common B-complex supplement twice daily, plus about 400 milligrams of magnesium, is usually adequate.

Ascorbate (the active ion in vitamin C) does increase the body’s production of oxalate. Yet, in practice, vitamin C does not increase oxalate stone formation. Drs. Emanuel Cheraskin, Marshall Ringsdorf, Jr. and Emily Sisley explain in The Vitamin C Connection (1983) that acidic urine or slightly acidic urine reduces the UNION of calcium and oxalate, reducing the possibility of stones. “Vitamin C in the urine tends to bind calcium and decrease its free form. This means less chance of calcium’s separating out as calcium oxalate (stones).” Also, the diuretic effect of vitamin C reduces the static conditions necessary for stone formation in general. Fast moving rivers deposit little silt.

Furthermore, you can avoid excessive oxalates by not eating (much) rhubarb, spinach, or chocolate. If a doctor thinks that a person is especially prone to forming oxalate stones, that person should read the suggestions below before abandoning the benefits of vitamin C.
Robert F. Cathcart II, M.D. writes on “Why Don’t Massive Doses of Ascorbate Produce Kidney Stones?”

“Years ago when Linus Pauling wrote his book “Vitamin C and the Common Cold”, the critics immediately labeled the taking of large doses of vitamin C dangerous because it would produce calcium oxalate kidney stones. This practice of telling people that vitamin C caused kidney stones continues today by the critics of vitamin C despite the lack of clinical evidence of kidney stones in people taking vitamin C.

“It was hypothesized that since a significant percentage of ascorbate was metabolized into and excreted as oxalic acid that this oxalic acid should combine with calcium in the urine and deposit as calcium oxalate kidney stones. It is true that those of us who take large doses of ascorbate have elevated oxalic acid in our urine but no kidney stones. With the millions of people in the world taking vitamin C, if vitamin C caused kidney stones there would have been a massive epidemic of kidney stones noticed by this time. There has been none.

“I started using vitamin C in massive doses in patients in 1969. By the time I read that ascorbate should cause kidney stones, I had clinical evidence that it did not cause kidney stones, so I continued prescribing massive doses to patients. To this day (2006) I estimate that I have put 25,000 patients on massive doses of vitamin C and none have developed kidney stones. Two patients who had dropped their doses to 500 mg a day developed calcium oxalate kidney stones. I raised their doses back up to the more massive doses and added magnesium and B6 to their program and no more kidney stones. I think that the low doses had no effect and they, by coincidence, developed the kidney stones because they were not taking enough vitamin C.”