Vitamin E supplementation used to be a simple proposition. There is a very good chance that your cardiologist is supplementing his or her diet with vitamin E. A recent survey commissioned by the Council for Responsible Nutrition (CRN) has concluded that 75 percent of cardiologists recommend vitamin E to their patients and about half of the cardiologists surveyed said they personally use vitamin E.

Scientists identified vitamin E about 80 years ago but only in the past few decades has its power as an antioxidant been revealed and fully appreciated. Vitamin E is a generic term describing a group of compounds called tocopherols and tocotrienols. Until recently most vitamin E products contained only tocopherols (alpha-, beta-, gamma- and delta-tocopherol). But this is changing as researchers have identified unique health properties of tocotrienols (alpha-, beta-, gamma- and delta-tocotrienol). Tocotrienols may be the most powerful of the vitamin E antioxidants.

Tocotrienols are fat-soluble vitamins related to the family of tocopherols. The term vitamin E is now considered to be the generic name describing both the tocopherols and tocotrienols. However, both are distinguished by their side chain. While tocopherol has a saturated phytyl tail, tocotrienol possesses an unsaturated isoprenoid side chain. Tocopherols and tocotrienols are further separated into individual compounds assigned by the Greek letter prefixes (α, β, δ, γ) depending on the number and position of methyl substitution (−CH₃) on the chromanol ring.

In nature, plants, fruits and vegetables produce both forms of vitamin E—tocopherols and tocotrienols. While tocopherols are generally present in common vegetable oils (i.e. soy, canola, wheat germ, sunflower), tocotrienols, on the other hand, are concentrated in cereal grains (i.e. oat, barley, and rye bran), with the richest source found in palm (Elaeis guineensis).

Several studies have shown that vitamin E improves the immune system, especially in the elderly. With age, the immune system becomes less efficient at fighting off microbes and viruses. Part of this decline may be due to low levels of vitamin E in the bloodstream. Some studies have shown improved immune responses in older people who take vitamin E supplements. Vitamin E may also slow the effects of aging by protecting cells from free radical damage.

In a randomized, double-blind, placebo-controlled intervention study at Tufts University and published in the Journal of the American Medical Association, daily supplementation with vitamin E enhances immunity in healthy elderly subjects. The antioxidant vitamin E inhibits prostaglandin E2 production and significantly improves certain clinically relevant in vivo indexes of cell-mediated immune response.

Subjects supplemented with vitamin E antioxidant at 200 mg/day had a 65 percent increase in delayed-type hypersensitivity skin response (DTH) and a significant increase in the amount of antibody made in response to hepatitis B and tetanus vaccine compared with placebo.

COX-2 is normally kept in check until it is needed to play its part specifically in the inflammation process. Hence COX-2, if well regulated, plays an important role because inflammation is sometimes needed for the body’s immune response. However, in people with chronic inflammation such as rheumatoid arthritis, uncontrolled COX-2 catalyzes the synthesis of prostaglandin E2 (PGE₂), which increases inflammation and its associated diseases such as cancer and vas-
cular heart disease.

Researchers from the University of California, Berkeley found that gamma-tocopherol was a better form of vitamin E in inhibiting COX-2 compared to alpha-tocopherol. In addition, the metabolite of gamma-tocopherol and gamma-tocotrienol: LUL-alpha was also found to be a potent inhibitor of COX-2 enzyme.\(^5\)

Tocotrienols, through their ability to reduce the synthesis of an eicosanoid, namely thromboxane B\(_2\) in the cyclo-oxygenase pathway, may have anti-inflammatory effect. Moreover, tocotrienols are speculated to inhibit the transcriptional activation of cyclo-oxygenase gene.\(^6\)

Almost all vitamin E supplements contain tocopherol (mainly the alpha-tocopherol form) but not tocotrienols. It doesn’t matter whether you take natural or synthetic vitamin E, the form used is almost always tocopherol. There is nothing wrong with alpha-tocopherol but if a person expects to obtain optimal and maximum antioxidant protection, s/he should take the full spectrum vitamin E that consists of both the tocopherols and tocotrienols as produced in nature.

All these forms of vitamin E work synergistically as a team to confer the maximum antioxidant and immune protection. Some other examples are mixed carotenoids instead of single betacarotene alone, B complex instead of a single B\(_6\) or B\(_12\) vitamin alone. The idea that one single form of vitamin E—

alpha-tocopherol out of eight fractions is the “magic” vitamin E, and assuming that the other forms are worthless, denies the very fact that nature put these seven other tocopherols and tocotrienols out there for a reason.

In light of this new development, scientists have begun to relook at their approach towards supplementation. The best approach is to mimic nature as nature knows best.

Elderly people can bolster their resistance to infection by taking daily vitamin E supplements. To realize vitamin E’s full health benefits in enhancing the immune system, one really needs both tocopherols and tocotrienols—“The E Complex”—as the most complete and balanced vitamin E formula. Web sites: www.carotech.net and www.tocotrienol.org

References:
4. Ibid.
6. Theriault, op.cit.