Vitamins and Minerals to Prevent Cardiovascular Disease and Cancer

The US Preventive Services Task Force (USPSTF) has recently published recommendations about the use of vitamins, minerals, and multivitamins to prevent cardiovascular disease and cancer.

What Are Vitamins and Minerals?
Vitamins (vitamins A, C, D, E, and K and the B vitamins) are compounds that are necessary for human bodies to maintain normal metabolism. Minerals (such as calcium, iron, and zinc) are substances that are also required for normal metabolic function. Vitamins and minerals can be combined, with or without other substances, in multivitamin or multimineral supplements.

Many people in the US take over-the-counter vitamins, minerals, and multivitamins because they believe that these supplements can help support overall health and fill nutrient gaps in their diet. Also, because vitamins and minerals have anti-inflammatory and antioxidative effects, there is a possibility that they prevent cardiovascular disease and cancer, which are important causes of death in the US.

What Is the Patient Population Under Consideration for Use of Vitamins and Minerals to Prevent Cardiovascular Disease and Cancer?
This recommendation applies to adults who are not pregnant or trying to become pregnant and who live in the community (rather than, for example, a nursing facility). It does not apply to children or to individuals with a known nutritional deficiency or those who are hospitalized.

For individuals who are pregnant and those planning for or capable of pregnancy, there is a separate USPSTF recommendation to take a daily supplement containing 0.4 to 0.8 mg (400-800 μg) of folic acid.

What Are the Potential Benefits and Harms of Using Vitamins and Minerals to Prevent Cardiovascular Disease and Cancer?
Studies have shown no benefit of taking multivitamins in reducing overall mortality, deaths from cardiovascular disease, or cancer-related deaths. Similarly, studies done specifically looking at supplementation with vitamin E, vitamin D, calcium, vitamin A, beta carotene, folic acid with or without vitamin B₁₂, vitamin B₃, vitamin B₆, vitamin C, and selenium have not shown benefits in reducing overall mortality. For many supplements, though, the evidence is limited.

For most vitamins and supplements, studies have shown little evidence of serious harms. However, some vitamins, such as vitamin A and vitamin D, may cause harm if taken in excessive doses. Additionally, an important harm of increased lung cancer incidence has been found with use of beta carotene by individuals who smoke or have occupational exposure to asbestos.

How Strong Is the Recommendation to Use Vitamins and Minerals to Prevent Cardiovascular Disease and Cancer?
Based on current evidence, the USPSTF concludes with moderate certainty that the harms of beta carotene supplementation for the prevention of cardiovascular disease or cancer outweigh the benefits. The USPSTF concludes with moderate certainty that there is no net benefit of supplementation with vitamin E for the prevention of cardiovascular disease or cancer. For other single or paired nutrients as well as multivitamins, the evidence is insufficient to determine the balance of benefits and harms of supplementation for the prevention of cardiovascular disease or cancer.