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## Heart healthy diet: A modifiable tool for cardiovascular disease prevention

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Physicians, like many other professions, face many challenges throughout the day. Long hours, coupled with the demands of patient care, leave little time to focus on their own health and nutrition. Despite these challenges, physicians are required to teach their patients about “healthy lifestyle habits” and “heart-healthy diets” as an important preventive step for many diseases.

In this fast-paced lifestyle, with an overwhelming amount of misinformation present on social media, it’s very hard to know exactly what’s really “heart healthy.” So what’s the evidence on dietary patterns to reduce atherosclerotic cardiovascular disease?

One study using data from *REGARDS* (Reasons for Geographic and Racial Differences in Stroke) looked at five different dietary patterns in more than 17,000 individuals. Over 5.8 years of follow up, this study found that the Southern dietary pattern that is high in fats, fried food, eggs, processed meats and sugar sweetened beverages, was associated with a 56% increase in acute coronary heart disease events and a 30% increase in stroke. Additionally, participants on the Southern diet had a higher prevalence of hypertension, dyslipidemia, and type 2 diabetes mellitus. [1]

Fats are common in the American diet and play a crucial role in cell metabolism, though fats are usually consumed in excess. Fatty acids differ on a molecular level and can be divided into saturated, unsaturated (mono- and poly-unsaturated) and trans-fatty acids (natural and artificial). [2]

Structurally, saturated fatty acids (SFA) are carbon molecules that are saturated with hydrogen molecules, which are typically solid at room temperature. Examples include palm oil, butter, cheese, dairy products, fatty red meat and pork. [2] Processed red meats, in particular, have been linked to increased risk of cardiovascular disease, including heart failure. Consumption of palm oil, for instance, resulted in a mean increase of 9.3 mg/dL LDL-C as compared with vegetable oils low in SFAs, according to one meta-analysis of 32 randomized controlled trials. [3]

Monounsaturated fatty acids (MUFA) have one unsaturated carbon bond (double bond) in the molecule and are typically liquid at room temperature. Examples include olive oil, canola oil, peanut oil and sesame oil. Avocados, peanut butter, many nuts and seeds are additional sources for these kinds of oils. [2] Polyunsaturated fatty acids (PUFA) have more than one unsaturated carbon bond in the molecule. Examples include soybean oil, corn oil, and sunflower oil. Walnuts, sunflower seeds, tofu and soybeans can be sources of these PUFAs as well. [2]

The American Heart Association/American College of Cardiology (AHA/ACC) 2019 guideline gives level of Evidence A for replacing SFA with dietary MUFA and PUFA as a beneficial strategy to reduce atherosclerotic cardiovascular disease risk. [4]

Natural trans-fatty acids are present in animal products such as milk and beef, however, *trans* fatty acids are created artificially using a process that adds hydrogen to liquid vegetable oils to make them more solid, commonly referred to as “partially hydrogenated oils”. These are no longer generally recognized as safe in human food as per FDA 2015. [5] Some examples include fried foods like doughnuts, cakes, pie crusts, biscuits, frozen pizza, cookies, crackers, and stick margarines and other spreads. [2] Current guidelines recommend avoiding consumption of trans-fatty acids.

More than 100,000 individuals from both the Nurses’ Health Study (NHS) and Health Professionals Follow-up Study (HPFS) were studied to understand how different dietary patterns relate to outcomes, with increases in all cause-mortality observed among those that had higher consumption of trans and saturated fats. Conversely, decreases in mortality were observed among those that consumed higher amounts of mono- and poly-unsaturated fats. [6] Olive oil was found to decrease LDL-C, triglycerides, and increased HDL-C as compared with dietary carbohydrates. [7]

Although many diets lack significant evidence of cardiovascular disease benefit, the Mediterranean diet is commonly recommended by many societies and guidelines, being high in olive oil, plant-based proteins, leafy vegetables, fruits and nuts, and backed by evidence. The *PREDIMED* (Prevención con Dieta Mediterránea) study evaluated the Mediterranean diet for primary prevention of cardiovascular disease in more than 7000 people who were at high cardiovascular risk. Over 5 years, individuals who were assigned to the Mediterranean diet plus virgin olive oil had a mean 30% reduction in the composite of myocardial infarction, stroke and cardiovascular disease, compared with low fat control group. [8]

Apart from the many benefits of olive oil, plant derived proteins such as bread, cereals, pasta, nuts, beans, lentils, and legumes intake were associated with lower cardiovascular mortality (hazard ratio 0.88 per 3% energy increment; 95% CI, 0.80 to 0.97). [9] More than 400,000 individuals were included in a meta-analysis that found that for each increment of 1 oz of green leafy vegetables, there was a 13% lower risk of developing type 2 diabetes mellitus. [10] In 110,000 women and men followed in the *NHS* and the *HPFS* studies, for 14–16 years, 3 serv-

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ings/day of green leafy vegetables, combined with a low-carbohydrate diet resulted in a 24% reduced risk of cardiovascular disease. [11]

All kinds of nuts, in moderation, were found to have beneficial effects on lipid profiles, with data suggesting a ~7–8% reduction in LDL-C can be achieved with 67 g (2.4 oz) of nuts in a pooled analysis of 25 randomized controlled trials. [12] Four servings of nuts/week (~28 g each) were associated with ~30% reduction in the relative risk for fatal and non-fatal cardiovascular disease. [13–15] Fruit intake also is associated with favorable cardiovascular benefits, with a 32% reduction in the risk of myocardial infarction and blood pressure reduction of about 7/5 mmHg (systolic/diastolic) with 1 cup of blueberries per day. [16–17]

Given the benefits of a Mediterranean style dietary pattern, consider adding a bag of nuts, a container of salad with olive oil and a box of berries to your lunch box. Although easier said than done, it's important to choose quality over quantity, as self-care is the first step towards better patient care.

### Declaration of Competing Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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