

## Dark Chocolate: Sweet Prevention for CV Events

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2 comment(s)

Dark chocolate may be an inexpensive way to help prevent cardiovascular events in patients at risk for heart disease, researchers found.

A modeling study predicts that patients with metabolic syndrome who eat dark chocolate every day could have 85 fewer events per 10,000 population over 10 years, Chris Reid, PhD, of Monash University in Melbourne, and colleagues reported online in *BMJ*.

At a cost of only \$42 per year, treatment with dark chocolate falls into an acceptable category of cost-effectiveness, at an incremental cost-effectiveness ratio (ICER) of \$50,000 per years of life saved.

"Chocolate benefits from being by and large a pleasant, and hence sustainable, treatment option," they wrote. "Evidence to date suggests that the chocolate would need to be dark and of at least 60% to 70% cocoa, or formulated to be enriched with polyphenols."

Several recent studies have suggested that eating dark chocolate has blood-pressure and lipid-lowering effects. To assess whether it could be an effective and cost-effective treatment option in patients potentially at risk for cardiovascular events, the researchers looked at data from patients in the Australian Diabetes, Obesity, and Lifestyle study.

They used a Markov model to assess health effects and associated costs of daily consumption of plain dark chocolate compared with no chocolate in a population with metabolic syndrome but without diabetes or cardiovascular disease.

The investigators also used risk-prediction algorithms and population life tables to determine the probability of patients developing or dying from heart disease or other noncardiovascular causes each year.

Data on the blood-pressure-lowering effects of dark chocolate were taken from a meta-analysis of 13 randomized controlled trials, and lipid-lowering effects from a meta-analysis of eight short-term trials.

Costs were taken from a review of the costs of cardiovascular complications in a healthy population, and included the direct costs of myocardial infarction and stroke.

They calculated the number of deaths prevented by determining the difference in the number of deaths between those consuming and not consuming dark chocolate.

The final model included a total of 2,013 patients with metabolic syndrome, mean age 53.6, mean systolic blood pressure 141.1 mmHg, mean total cholesterol 6.1 mmol/L, mean HbA1c 34.4 mmol/mol, and mean waist circumference 100.4 cm.

Reid and colleagues found that daily consumption of dark chocolate -- a polyphenol content equivalent to 100 grams of dark chocolate -- can reduce cardiovascular events by 85 per 10,000 population over 10 years.

Specifically, with 100% compliance, treatment would prevent 70 non-fatal and 15 fatal cardiovascular events per 10,000 population over that time. The authors noted that this was a



### Action Points

A "best case scenario" analysis based on a Markov model concluded that daily consumption of dark chocolate could reduce the risk of cardiovascular events over a 10-year period in patients with metabolic syndrome.

Note that the model also predicted that this prevention approach was cost-effective assuming 100% compliance.

"best case scenario" analysis.

When compliance was reduced to 90%, the number of preventable non-fatal and fatal events fell to 60 and 10, respectively, and at a compliance of 80%, was reduced to 55 and 10, respectively. Even at these levels, however, daily dark chocolate was still considered an effective and cost-effective intervention strategy, they wrote.

At a cost of \$42 per person per year, dark chocolate prevention strategies came to an estimated ICER of \$50,000 per years of life saved -- a figure well within typical cost-effectiveness thresholds, the researchers said.

That \$42 could be spent on advertising, educational campaigns, or subsidization of dark chocolate in higher-risk populations, they wrote.

Reid and colleagues noted that the study was limited by its reliance on the Framingham algorithm, which may underestimate risk in a high-risk population, and by assumptions about the risk of death following a cardiovascular event.

The study was also limited by the assumption that the benefits of dark chocolate, which have only been observed in short-term trials, extend to 10 years. Still, they concluded that the findings suggest dark chocolate may be an effective and cost-effective strategy for preventing heart disease in patients with metabolic syndrome.

The study was supported by an Australian Research Council linkage grant with Sanofi-Aventis Australia.

The researchers reported no conflicts of interest.

**From the American Heart Association:**

[Dietary Sugars Intake and Cardiovascular \(CV\) Health](#)

[Population-Based Prevention of Obesity: Comprehensive Promotion of Healthful Eating, Physical Activity, and Energy Balance](#)

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Zomer E, et al "The effectiveness and cost effectiveness of dark chocolate consumption as prevention therapy in people at high risk of cardiovascular disease: best case scenario analysis using a Markov model" *BMJ* 2012; DOI: 10.1136/bmj.e3657.

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