

# Omega-3 fatty acids appear to protect damaged heart after heart attack

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Taking omega-3 fatty acids appeared to lower inflammation and guard against further declines in heart function among recent heart attack survivors already receiving optimal standard care, according to results from a randomized, controlled trial to be presented at the American College of Cardiology's 64th Annual Scientific Session in San Diego.

Patients in the study taking 4 grams of prescription-only [omega-3 fatty acid](#) capsules daily for six months after a [heart attack](#) were significantly more likely to show improvements in heart function compared to patients taking a placebo. Heart function was measured by an expansion of the left ventricular endsystolic volume index. Patients taking omega-3 fatty acids also had significantly less evidence of fibrosis—a thickening or scarring of the areas of the heart remote from the heart attack, which can develop when the surviving heart muscle works harder and under high pressure to compensate for the damage to the heart. The data suggests that patients who were able to mount a substantial change in levels of omega-3 fatty acids in their blood derived the most benefit.

"Giving a high dose of omega-3 fatty acids soon after a heart attack appears to improve cardiac structure and heart functioning above and beyond the standard of care," said Raymond W. Kwong, M.D., M.P.H., director of cardiac [magnetic resonance imaging](#) at Brigham and Women's Hospital in Boston and the study's senior author. "Because this is a unique group of patients with remarkably high adherence to [guideline-directed] treatments for acute myocardial infarction already, we feel fairly confident that the benefits from this therapy are additive.

The implications of this study could be fairly large."

An estimated 720,000 Americans have heart attacks each year. After a heart attack, the heart can remodel or reorganize itself to maintain or improve function. In some cases, the heart may undergo adverse changes such as enlargement of the heart, decreased pumping ability or added cardiac strain that can predispose someone to heart failure and arrhythmias later in life.

Although earlier studies have shown that omega-3 fatty acids may lower the risk of irregular heartbeats and death from a heart attack, research has not consistently shown a benefit. Kwong said his research is the first to use quantitative cardiac imaging to look at how omega-3 fatty acids might actually protect the heart after a major heart attack.

Researchers randomized 374 patients recovering from a heart attack and receiving standard treatment to take either 4 grams of omega-3 fatty acids or a placebo; groups were balanced in terms of location of the infarct—anterior or non-anterior—and age. Blood work and cardiac imaging were analyzed at two to four weeks post-heart attack and again at six months. Compared to previous research, this study used a much higher dose of omega-3 fatty acids, 4 grams compared to 1 gram daily, and a small amount of corn oil, which does not contain fatty acids, as the placebo.

By using cardiac magnetic resonance imaging, researchers were able to look at changes in patients' hearts and see the disease process before and after treatment. Adverse changes in left ventricular remodeling and function, in addition to the worsening of fibrosis, were used as surrogates for poor outcomes after heart attack.

Patients taking the omega-3 fatty acids were 39 percent less likely to show a deterioration of heart function as compared to patients taking a

placebo. The analysis also looked at key markers of systemic inflammation, which were also more likely to be improved in those taking the fish oil. In particular, the percent reduction in ST2, a marker of the severity of adverse cardiac remodeling and tissue fibrosis, was substantially greater in the treatment arm after six months.

"Omega-3 fatty acids may have anti-inflammatory effects and also promote better cardiac healing," Kwong said. "This is important because other anti-inflammatory agents, including steroids and NSAIDs, have failed to make a difference after myocardial infarction." Patients in the study who had a 5 percent increase in the amount of omega-3 fatty acid in their blood seem to have the best chance of improving [heart function](#).

"If this becomes a useful therapy, it seems a 5 percent increase in the serum level of omega-3 fatty acids correlates with a 10 percent improvement in left ventricular remodeling," he said. In this study, most (92 percent) of patients randomized to fish oil increased omega-3 fatty acid by at least 5 percent, compared with less than half (42 percent) of patients receiving placebo.

Kwong said the higher-dose omega-3 fatty acids was not found to be associated with any major safety issues, such as increased bleeding. "It's a very well-tolerated therapy," he said, adding that it is unlikely patients could get the amount of omega-3 fatty acids from diet alone. He said the daily 4 gram dose is roughly equivalent to someone eating a large, 8-ounce serving of salmon every day for six months.

For many years, the American College of Cardiology and the American Heart Association have recommended that people eat fish rich in omega-3 fatty acids at least twice a week because of its potential heart benefits.

Kwong said most North Americans do not follow this advice, while

Japanese populations with higher levels of omega-3 and an otherwise similar risk profile to North Americans have lower risks of heart disease and sudden cardiac death. The increase in the omega-3 blood content of many patients in Kwong's study at six months was similar to levels found in Japanese populations with a diet very rich in omega-3 fatty acids.

Fatty fish such as salmon, tuna, trout and sardines contain the most omega-3 fatty acids. Fatty acids are a key component of cell membranes and they help with cell signaling, proper immune function and may also improve cognitive functioning. This study is limited in that it did not investigate the association between omega-3 [fatty acids](#) and cardiac events after heart attack; assessing this relationship would require a large group of [patients](#) over many years. It also did not evaluate this treatment immediately after having a [heart](#) attack.

**More information:** The study, "Effect of Purified Omega-3 Fatty Acids on Reducing Left Ventricular Remodeling after Acute Myocardial Infarction (OMEGA-REMODEL Study: A Double-Blind Randomized Clinical Trial)," will be presented on March 16 at 10:45 a.m. PT/1:45 p.m. ET/5:45 p.m. UTC the American College of Cardiology's 64th Annual Scientific Session in San Diego. The meeting will run March 14-16.

Provided by American College of Cardiology

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