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(Last updated 7/12/11)

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Previous stories pertaining to the research of Professors Kiecolt-Glaser and Glaser:

["Breast Cancer Patients' Persistent Fatigue Is Real, May Actually Speed Up Aging."](#) 4/6/11.

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OMEGA-3 REDUCES ANXIETY AND INFLAMMATION IN HEALTHY STUDENTS

COLUMBUS, Ohio – A new study gauging the impact of consuming more fish oil showed a marked reduction both in inflammation and, surprisingly, in anxiety among a cohort of healthy young people.

The findings suggest that if young participants can get such improvements from specific dietary supplements, then the elderly and people at high risk for certain diseases might benefit even more.

The findings by a team of researchers at Ohio State University were just published in the journal [Brain, Behavior and Immunity](#). It is the latest from more than three decades of research into links between psychological stress and immunity.

[Omega-3 polyunsaturated fatty acids](#), such as [eicosapentaenoic acid \(EPA\)](#) and [docosahexaenoic acid \(DHA\)](#), have long been considered as positive additives to the diet. Earlier research suggested that the compounds might play a role in reducing the level of [cytokines](#) in the body, compounds that promote [inflammation](#), and perhaps even reduce depression.

Psychological stress has repeatedly been shown to increase cytokine production so the researchers wondered if increasing omega-3 might mitigate that process, reducing inflammation.

To test their theory, they turned to a familiar group of research subjects – medical students. Some of the earliest work these scientists did showed that stress from important medical school tests lowered students' immune status.

“We hypothesized that giving some students omega-3 supplements would decrease their production of proinflammatory cytokines,

[May Shorten Life, Weaken Immune Response Among The Elderly.](#) 8/9/10.

["Yoga Reduces Cytokine Levels Known To Promote Inflammation."](#) 1/11/10.

["Stress, Anxiety Can Make Allergy Attacks Even More Miserable And Last Longer."](#) 8/11/08.

["Aromatherapy May Make You Feel Good, But It Won't Make You Well."](#) 3/3/08.

["Stress Hormone May Hasten The Progression Of Certain Blood Cancers."](#) 11/19/07.

["Chronic Stress Can Steal Years From Caregivers' Lifetimes."](#) 9/18/07.

["Omega-3 Fatty Acids Affect Risk Of Depression, Inflammation."](#) 3/28/07.

["Stress Substantially Slows Human Body's Ability To Heal."](#) 11/21/05.

["Mechanism Found That Weakens Caregivers' Immune Status."](#) 6/26/03.

["Former Caregivers Still Show Psychological Ills Years After Caregiving Ends."](#) 12/12/01.

["Hypnosis May Prevent Weakened Immune Status, Improve Health."](#) 9/24/01.

["Even Happy Experiences Can't Reduce Stress, New Research Shows."](#) 8/2/00

["Researchers Learn How Stress Slows Wound Healing."](#) 7/26/99

["Stress May Increase Susceptibility To Infectious](#)

compared to other students who only received a placebo," explained [Janice Kiecolt-Glaser](#), professor of [psychology](#) and [psychiatry](#).

"We thought the omega-3 would reduce the stress-induced increase in cytokines that normally arose from nervousness over the tests."

The team assembled a field of 68 first- and second-year medical students who volunteered for the clinical trial. The students were randomly divided into six groups, all of which were interviewed six times during the study. At each visit, blood samples were drawn from the students who also completed a battery of psychological surveys intended to gauge their levels of stress, anxiety or depression. The students also completed questionnaires about their diets during the previous weeks.

Half the students received omega-3 supplements while the other half were given placebo pills.

"The supplement was probably about four or five times the amount of fish oil you'd get from a daily serving of salmon, for example," explained [Martha Belury](#), professor of [human nutrition](#) and co-author in the study.

Part of the study, however, didn't go according to plans.

Changes in the medical curriculum and the distribution of major tests throughout the year, rather than during a tense three-day period as was done in the past, removed much of the stress that medical students had shown in past studies.

"These students were not anxious. They weren't really stressed. They were actually sleeping well throughout this period, so we didn't get the stress effect we had expected," Kiecolt-Glaser said.

But the psychological surveys clearly showed an important change in anxiety among the students: Those receiving the omega-3 showed a 20 percent



Ronald Glaser



Janice Kiecolt-Glaser



Martha Belury

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"It may be too early to recommend a broad use of omega-3 supplements throughout the public, especially considering the cost and the limited supplies

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["New Hypothesis Proposed for Cause of Chronic Fatigue Syndrome,"](#) 10/28/98

["Stress Slows Healing Of Dental Wounds By 40 Percent,"](#) 6/17/98

["Stress of Breast Cancer Surgery, Diagnosis Weakens Immune System,"](#) 1/20/98

["Marital Arguments Lead To Weakened Immune Systems In Older Couples,"](#) 8/14/97

["Psychological Stress Can Slow The Rate of Wound Healing,"](#) 4/22/97

["Effects of Arguments Linger Long After Fights End, Study Shows,"](#) 4/22/97.

["High Stress Weakens Immune Function In Breast Cancer Patients,"](#) 3/11/97

reduction in anxiety compared to the placebo group.

An analysis of the of the blood samples from the medical students showed similar important results.

“We took measurements of the cytokines in the blood serum, as well as measured the productivity of cells that produced two important cytokines, [interleukin-6 \(IL-6\)](#) and [tumor necrosis factor alpha \(TNFa\)](#),” said [Ron Glaser](#), professor of [molecular virology, immunology & medical genetics](#) and director of the [Institute for Behavioral Medicine Research](#).

“We saw a 14 percent reduction in the amounts of IL-6 among the students receiving the omega-3.” Since the cytokines foster inflammation, “anything we can do to reduce cytokines is a big plus in dealing with the overall health of people at risk for many diseases,” he said.

While inflammation is a natural immune response that helps the body heal, it also can play a harmful role in a host of diseases ranging from arthritis to heart disease to cancer.

While the study showed the positive impact omega-3 supplements can play in reducing both anxiety and inflammation, the researchers aren’t willing to recommend that the public start adding them to the daily diet.

“It may be too early to recommend a broad use of omega-3 supplements throughout the public, especially considering the cost and the limited supplies of fish needed to supply the oil,” Belury said. “People should just consider increasing their omega-3 through their diet.”

Some of the researchers, however, acknowledged that they take omega-3 supplements.

Also working on the research with Kiecolt-Glaser, Glaser and Belury were [William Malarkey](#), professor emeritus of internal medicine, and [Rebecca Andridge](#), an assistant professor of public health.

The study was supported in part by a grant from the [National Center for Complementary and Alternative Medicine](#), a part of the [National Institutes of Health](#).

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