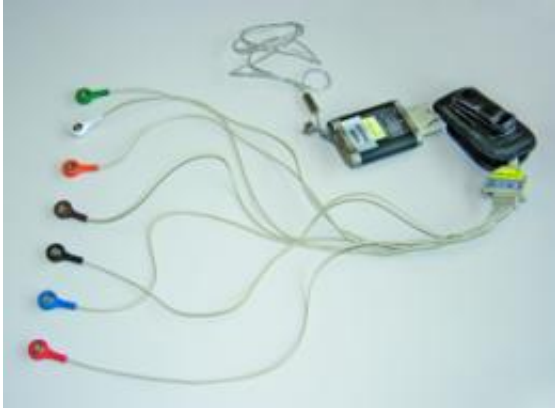


# Calorie-restricted diet keeps heart young

June 6 2012, By Jim Dryden

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Portable heart monitors were worn by study volunteers who practiced calorie restriction and others of about the same age who ate standard diets so that scientists could measure their heart rate variability.

(Medical Xpress) -- People who restrict their caloric intake in an effort to live longer have hearts that function more like those in people who are 20 years younger.

Researchers at Washington University School of Medicine in St. Louis have found that a key measure of the [heart](#)'s ability to adapt to physical activity, stress, sleep and other factors that influence the rate at which the heart pumps blood, doesn't decline nearly as rapidly in people who have significantly restricted their [caloric intake](#) for an average of seven years.

The study is available online in the journal *Aging Cell*.

“This is really striking because in studying changes in [heart rate variability](#), we are looking at a measurement that tells us a lot about the way the autonomic nervous system affects the heart,” says Luigi Fontana, MD, PhD, the study’s senior author. “And that system is involved not only in heart function, but in digestion, breathing rate and many other involuntary actions. We would hypothesize that better heart rate variability may be a sign that all these other functions are working better, too.”

The researchers hooked portable heart monitors to 22 practitioners of calorie restriction (CR) who ate healthy diets but consumed 30 percent fewer calories than normal. Their average age was just over 51. For comparison purposes, researchers also studied 20 other people of about the same age who ate standard Western diets. Heart rates were significantly lower in the CR group, and their heart rate variability was significantly higher.

“Higher heart rate variability means the heart can adjust to changing needs more readily,” says lead author Phyllis K. Stein, PhD. “Heart rate variability declines with age as our cardiovascular systems become less flexible, and poor heart rate variability is associated with a higher risk of cardiovascular death.”

Stein, a research associate professor of medicine in the Division of Cardiology, has measured heart rate variability in a number of different groups, from older adults to those with depression. This study was her first experience evaluating heart rate variability in the group often referred to as CRONies (Calorie Restriction with Optimal Nutrition), but members of that group have been studied extensively by Fontana, a research associate professor of medicine at Washington University and investigator at the Istituto Superiore di Sanita in Rome, Italy.

“The idea was to learn, first of all, whether humans on CR, like the

calorie-restricted animals that have been studied, have a similar adaptation in heart rate variability,” Fontana says. “The answer is yes. We also looked at normal levels of heart rate variability among people at different ages, and we found that those who practice CR have hearts that look and function like they are years younger.”

Laboratory animals with a restricted calorie intake tend to live 30 percent to 40 percent longer than those that eat standard diets. Many humans who practice calorie restriction believe they also will live significantly longer, but that won’t be known for several more years. Still, Fontana says much of his research suggests [calorie restriction](#) with optimal nutrition contributes to significant changes in people that are similar to changes seen in animals.

“In many of our studies, we have found that a number of metabolic and physiologic changes that occur in calorie-restricted animals also occur in people who practice CR,” Fontana says.

And he says the finding that heart [rate variability](#) is better in people who practice CR means more than just that their cardiovascular systems are flexible. He says the better ratio suggests improved health in general.

“But we can’t be absolutely positive that the practice of CR is solely responsible for the flexibility of the cardiovascular system,” Stein says. “People who practice CR tend to be very healthy in other areas of life, too, so I’m pretty sure they don’t say to themselves, ‘Okay, I’ll restrict my calorie intake to lengthen my life, but I’m still going to smoke two packs a day.’ These people are very motivated, and they tend to engage in a large number of very healthy behaviors.”

**More information:** Stein PK, et al. Caloric restriction may reverse age-related autonomic decline in humans. *Aging Cell*, vol. 11, Advance Online Publication. [DOI: 10.1111/j.1474-9726.2012.00825.x](https://doi.org/10.1111/j.1474-9726.2012.00825.x)

Provided by Washington University School of Medicine in St. Louis

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