According to a study published in November in JAMA Internal Medicine, people who exercised as young adults were more likely to live longer and showed lower risks of cardiovascular disease than less active peers later in life. The results of the study were publicized by Reuters on Nov. 30, 2015.

What do we know about the link between fitness and heart health? Why does exercising decrease the risk of cardiovascular disease?

There has long been a clear association between cardiovascular health and overall fitness. Exercising decreases the risk of cardiovascular disease in many ways. Prior studies have demonstrated a link between cardiorespiratory fitness and cardiovascular events and even death.

Some studies suggest that up to 12 percent of all mortality in the United States is related to the lack of regular physical activity and that inactivity is associated with at least a twofold increase in the risk for coronary events. In addition to weight loss, regular exercise and overall cardiovascular fitness may decrease the risk of cardiovascular disease by reducing blood pressure, improving one’s lipid profile by increasing the “good” cholesterol (HDL) and lowering triglycerides and the “bad” cholesterol (LDL).

Additionally, it has a role in the treatment and possible prevention of type 2 diabetes, and there is mounting evidence that it may also lead to a reduction in inflammation, which plays a potentially important role in the development of atherosclerosis, a disease characterized by the accumulation of plaque in the arteries.

What was this study attempting to learn?

This study looked at the baseline cardiorespiratory fitness of young adults and whether improvement in their cardiorespiratory fitness when young would translate to better health later in life.

What is unique about this new study? What hadn’t been studied before?

This study was able to examine the association between exercise, fitness and cardiovascular health from young adulthood and then track this younger group of patients as they aged. The researchers then assessed how their overall cardiovascular fitness translated to endpoints such as heart attack, stroke, heart muscle weakness and heart muscle thickness as well...
as “hardening of the arteries” (demonstrated by calcium accumulation in the heart blood vessels, which is a marker for coronary artery disease).

Despite the data to support cardiorespiratory fitness across all ages, there was surprisingly little data that looked specifically at the younger patient population. Most previous studies focused on middle age and older adults.

Who did the researchers study? Where were they from? How did they define young adulthood?

The study included 4,872 adults aged 18 to 30 who performed treadmill tests in 1985 and 1986, with almost half of them repeating the exercise stress tests seven years later. The participants were recruited from four sites in the United States (Minneapolis, Minn.; Oakland, Calif.; Chicago, Ill.; and Birmingham, Ala.) The participants in the study were then monitored over the next several decades for obesity, hardening of the arteries (by coronary calcium assessment), heart muscle weakness, and cardiovascular events that included heart attacks and strokes.

How was the study designed? How was fitness measured? What type of exercise did the participants do? For how long? How often? When did the researchers follow up with the participants? What did they seek to measure?

The CARDIA study was a longitudinal cohort study, meaning it was designed to study determinants of cardiovascular disease in young patients over time. Serial follow-up occurred at years two, five, seven, 10, 15, 20 and 25 years after enrollment into the study. This type of study attempts to collect data on a group of individuals of interest over time to draw conclusions relating fitness with prognosis. Fitness was measured utilizing a baseline stress test and then repeating the stress test again at year seven. The stress test consisted of up to nine two-minute stages of gradually increasing difficulty, and maximal exercise duration was considered the primary measure of cardiorespiratory fitness.

Additional information was gathered looking at cardiac imaging to assess “hardening of the arteries” (calcium score) by CT scan later in the study. The researchers also assessed heart muscle thickness as well as other measures of heart function by ultrasound measurements. The participants in the study were contacted yearly to inquire about interim hospitalizations and to assess details regarding those hospitalizations.

What were the most significant results? Did age, race, gender, obesity, smoking, diabetes, blood pressure, and elevated cholesterol play a role?

The results of the study revealed that every one-minute increase in treadmill time that the participants were able to achieve translated to a 12 percent lower risk of cardiovascular disease and 15 percent lower odds of death by the end of the study. In addition, every one-minute increase in treadmill time also was associated with less strain on the heart muscle but — interestingly — was not associated with changes in the calcium accumulation in the blood vessels of the heart (“hardening of the arteries”).

Among the group of patients in the study who were evaluated again after seven years, each minute reduction in exercise tolerance was associated with a 20 percent increase in cardiovascular events and a 21 percent greater odds of death. These findings persisted despite accounting for an individual’s age, race, gender, obesity, and traditional cardiovascular risk factors such as smoking, diabetes, hypertension, and elevated cholesterol levels.
Why are these results important? How can they be explained? What do they say about the nature of exercise or obesity? What about diet?

The results of this study are extremely important and can be explained by the positive effects that exercise and cardiovascular fitness have on overall health. The fact that this was demonstrated to have an effect starting in early or young adulthood that translated to positive endpoints later in life should reinforce physicians’ recommendations to initiate exercise programs early in their patients’ lives.

Obesity did not seem to change the outcomes of the participants. One interpretation might be that despite an individual’s weight and body mass index, exercise and fitness will decrease an individual’s cardiovascular events over time. Furthermore, as the authors of the study point out, individuals should think about exercise as more than merely a tool for weight management. The study as it is designed could not speak to the effects of diet. As a matter of fact, the authors conceded that some of the association between fitness and cardiovascular health could be explained by improved diet as well.

In light of this study, what should young people know about the value of exercise? What, if anything, can be learned to help older people?

This study was able to demonstrate that if a younger individual had higher levels of fitness at baseline and improvement in fitness early in adulthood, those habits will translate to lower risks for cardiovascular disease and mortality. The results suggest that cardiorespiratory fitness in young adults is a modifiable predictor for cardiovascular disease and mortality. This is the actual value of this study in that it suggests that the earlier you obtain or improve your overall fitness, the less likely you will suffer from negative cardiovascular events.

Although the study did not specifically look at older individuals, it is well known that cardiorespiratory fitness is associated with overall risk at that particular time of assessment, and there are numerous studies that support the overall health benefits of obtaining greater fitness.