



Unfit at 20, Diabetes at 40

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Published: June 22, 2009

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LITTLE FALLS, N.J., June 22 -- [Twenty-somethings who aren't physically fit may be at an increased risk of developing diabetes in middle age,](#) researchers said.

[Those with low aerobic fitness levels as measured by a treadmill test were two to three times more likely to develop the disease over a 20-year period,](#) Mercedes Carnethon, PhD, of Northwestern University, and colleagues reported online in *Diabetes Care*.

"[Patients] who have low fitness in their late teens and 20s tend to stay the same later in life or even get worse," Dr. Carnethon said. "Not many climb out of that category."

The researchers have previously reported that [improved fitness over seven years was associated with a lower likelihood of developing diabetes.](#)

To date, no studies have investigated whether changes in fitness that correspond with the "long latency period for the development of diabetes" are associated with diabetes down the road, the researchers said.

To investigate, the researchers assessed health and exercise information on 3,989 patients in the Coronary Artery Risk Development in Young Adults (CARDIA) study.

Fitness was determined by a treadmill test at up to three examinations over a 20-year period.

The researchers found that those who developed diabetes over that time experienced greater declines in fitness than those who remained free of diabetes.

Women were at a 22% increased risk of developing diabetes (95% CI 1.09 to 1.39), and men were at a 45% increased risk for every standard deviation decrease from the mean fitness change (95% CI 1.20 to 1.75).

Baseline fitness was still inversely associated with diabetes incidence in all race-sex groups even after adjusting for age, smoking, family history of diabetes, and baseline fasting glucose, the researchers said.

They also noted a "marked attenuation" in the association of fitness and diabetes when adjusting for body mass index.

"Baseline BMI appears relatively more strongly associated with the incidence of diabetes than baseline fasting glucose as well as baseline fitness," they said.

"If two people have a similar level of fitness, the person with the higher BMI is more likely to develop diabetes," Dr. Carnethon said.

She added that the finding suggests that the "mechanism by which fitness decreases risk for diabetes is through the regulation of body mass."

[Physical fitness may protect against diabetes via weight loss, improved muscle insulin sensitivity, improved endothelial function and autonomic function, or reduced inflammation and oxidative stress,](#) the researchers said.

They concluded that regular physical activity to "improve and maintain cardiorespiratory fitness is an important component of a healthy lifestyle."

"We have identified one risk factor," they added, "that if modified, could lower the incidence of diabetes in the population."

The study was supported by a grant from the National Heart, Lung, and Blood Institute.

Action Points

- Explain that patients with low aerobic fitness levels were two to three times more likely to develop diabetes than those who [maintained their physical fitness.](#)

The researchers reported that they had no conflicts of interest.

Primary source: Diabetes Care

Source reference:

Carnethon MR, et al "Association of 20-year changes in cardiorespiratory fitness with incident type 2 diabetes: The CARDIA fitness study" *Diabetes Care* 2009; DOI: 10.2337/dc08-1971.

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