

Number of obese years not—just obesity—a distinct risk factor for heart damage

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OBESITY and the Risk of Heart Disease



FOR EVERY
10 YEARS



THAT A PERSON
SPENT OBESE

=

THEIR RISK OF
HAVING HEART
DAMAGE

 **1.25**
TIMES

In an analysis of clinical data collected on more than 9,000 people, Johns Hopkins researchers have shown that the number of years spent overweight or obese appear to 'add up' to a distinct risk factor that makes those with a longer history of heaviness more likely to test positive for a chemical marker of so-called 'silent' heart damage than those with a shorter history. Credit: Johns Hopkins Medicine

In an analysis of clinical data collected on more than 9,000 people, Johns Hopkins researchers have shown that the number of years spent overweight or obese appear to "add up" to a distinct risk factor that makes those with a longer history of heaviness more likely to test positive for a chemical marker of so-called "silent" heart damage than those with a shorter history.

The researchers say the findings suggest that maintaining a healthy weight across the lifespan is important for keeping the [heart](#) healthy and minimizing damage as people age.

The authors caution that their study wasn't designed to find or measure a direct cause and effect relationship between being overweight long-term and a higher risk of heart [disease](#), but rather to shed light on possible relationships between the two.

"We're finding that people's weight from age 25 onwards is linked to the risk of more or less [heart damage](#), as measured by levels of the protein [troponin](#), later in life, which underscores the likely importance of long-term weight control for reducing heart disease risk," says Chiadi Ndumele, M.D., M.H.S., the Robert E. Meyerhoff Assistant Professor of Medicine at the Johns Hopkins University School of Medicine and a member of the Johns Hopkins Ciccarone Center for the Prevention of Heart Disease. "What our findings suggest is that even in the absence of

such [heart disease risk](#) factors as [high blood pressure](#), diabetes or kidney disease, the number of years spent obese or overweight contributes to the higher likelihood of heart damage."

In 2014, Ndumele and colleagues showed that [excessive weight is linked to silent heart damage](#) as detected by elevated [troponin levels](#) of 14 nanograms per liter or higher—a clinical indicator of heart damage identified with a blood protein test. But that study didn't evaluate the role of being overweight over an extended period of time.

For the new study, summarized in the January issue of the journal *Clinical Chemistry*, the research team used data gathered on 9,062 [participants](#) in the federally funded Atherosclerosis Risk in Communities (ARIC) study in Washington County, Maryland, Forsyth County, North Carolina, Jackson, Mississippi, and Minneapolis. Of the participants, 58 percent were women and 21 percent were African-American.

Participants were recruited from 1987 through 1989 and were seen four times through 1998 to assess body mass index (BMI), history of heart disease and levels of high sensitivity troponin in the blood. Participants also self-reported their weight at age 25, which provided information on weight from young adulthood through late middle age and elderly years. The average age at the fourth visit was 63.

Nearly 23 percent of participants had an increase in BMI from the first visit to the fourth visit. A BMI of more than 25 kilograms per meter squared indicates a person is overweight, and a BMI of more than 30 indicates obesity. At the fourth visit, 3,748 participants were overweight and 3,184 were obese. Some 5 percent showed a decreased BMI and 72 percent remained the same.

At the fourth visit, almost 7 percent of the participants, or 623 people, had increased levels of troponin to 14 nanograms per liter or more.

Those who increased in BMI to the overweight and obesity range at the fourth visit were 1.5 times more likely to have increased troponin levels of at least 14 nanograms per liter, indicating heart damage.

The experts then looked at the BMI at the beginning and end of the study period alongside participants' troponin levels. Those people who were obese at both the first and fourth visits were twice as likely as those with persistently normal weight to have increased troponin levels to more than 14 nanograms per liter. Those with obesity at both the fourth visit and at age 25 were almost four times more likely to have increased troponin levels.

On a scale of zero to 50 years, the researchers then tabulated the number of years each person spent being obese, defined as a BMI over 30. For each 10 years that a person spent obese, their risk of having elevated troponin increased 1.25 times, even when accounting for [heart disease](#) risk due to high blood pressure, diabetes and kidney disease.

To develop a measurement of cumulative weight, the researchers calculated excess BMI-years for each participant. Using data from age 25 and each visit, they calculated the average BMI and multiplied the average excess BMI above 25 kilograms per meter squared by the number of years of follow-up (from age 25 to their age at visit four). Those with a BMI less than 25 kilograms per meter squared at different time points could receive negative values for excess BMI years.

BMI-years for the participants ranged from -274 to 1,205. On average, each 100 extra BMI-years increased the likelihood, or risk, of increased troponin by 21 percent.

"It's challenging to effectively communicate future risk to young people who seem perfectly healthy and at the prime of their lives," says Ndumele. "A measurement like excess BMI-years could be developed

and tested as a way of communicating risk to young and middle age people to reduce their long-term [risk](#) of cardiovascular disease by maintaining a healthy weight."

Ndumele says there is some evidence that losing [weight](#) even after decades of obesity or being overweight may help reduce troponin levels and that the heart has the ability to heal somewhat, but the extent to which it can heal and the number of years spent obese that may cause permanent damage are unknown and require more study.

According to the Centers for Disease Control and Prevention, more than a third of adults in the U.S. are obese.

More information: Chiadi E. Ndumele et al. Weight History and Subclinical Myocardial Damage, *Clinical Chemistry* (2017). [DOI: 10.1373/clinchem.2017.282798](#)

Provided by Johns Hopkins University School of Medicine

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