Higher "normal" body weight and gains after 18 years of age increased the risk for CHD in women

*Willett WC, Manson JE, Stampfer MJ, et al. **Weight, weight change, and coronary heart disease in women. Risk within the 'normal' weight range.** JAMA. 1995 Feb 8;273:461-5.*

Objective
To assess the validity, in terms of risk for coronary heart disease (CHD), of the 1990 U.S. weight guidelines for women, which increased the range of desirable body mass index (BMI) at 35 years of age from 19 to 24 kg/m^2 to a range of 21 to 27 kg/m^2.

Design
14-year cohort study of participants in the Nurses' Health Study.

Setting
United States.

Participants
115 818 female registered nurses aged 30 to 55 years in 1976 who had not been diagnosed with CHD and who were not pregnant.

Assessment of Risk Factors
In 1976, data were collected on age, current height and weight, current and past smoking, parental history of myocardial infarction (MI), reproductive history, use of oral contraceptives or postmenopausal hormones, and personal history of MI or angina pectoris. Follow-up questionnaires were sent out every 2 years to update this information and to ascertain the occurrence of major illnesses. In 1980, participants were asked to record their weights at the age of 18 years.

Main Outcome Measures
CHD including symptomatic nonfatal MI or fatal CHD.

Main Results
During 14 years of follow-up, 1292 incident cases of CHD were documented, including 991 nonfatal MIs and 389 fatal events. After controlling for age, smoking, menopausal status, postmenopausal hormone use, and parental history of CHD, and using women with a BMI of < 21 kg/m^2 as a reference, the relative risk (RR) for CHD was 1.19 (95% CI, 0.98 to 1.44) for a BMI of 21 to 22.9 kg/m^2, 1.46 (CI, 1.20 to 1.77) for a BMI of 23 to 24.9 kg/m^2, 2.06 (CI, 1.72 to 2.48) for a BMI of 25 to 28.9 kg/m^2, and 3.56 (CI, 2.96 to 4.29) for a BMI of ≥ 29 kg/m^2. Weight gain from 18 years of age to 1976 was strongly associated with increased risk for CHD during the next 14 years of follow-up when adjusted for the BMI at 18 years of age and other coronary risk factors. The RRs were 1.25 (CI, 1.01 to 1.55) for a 5- to 7.9-kg gain, 1.65 (CI, 1.33 to 2.05) for an 8- to 10.9-kg gain, 1.92 (CI, 1.61 to 2.29) for an 11- to 19-kg gain, and 2.65 (CI, 2.17 to 3.22) for a ≥ 20-kg gain.

Conclusions
Higher levels of adiposity within the "normal" range, as assessed by the body mass index, were associated with an increased risk for fatal and nonfatal coronary heart disease. Even modest weight gains after 18 years of age were also associated with a higher risk for coronary heart disease.

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Commentary

The study by Willett and colleagues indicates that the risk for nonfatal MI and fatal CHD, in women whose BMI was determined at 30 to 55 years of age, increased steadily with an increasing BMI over the subsequent 14 years; this occurred even among women without hypertension or diabetes. The risk for CHD was increased among some women whose weight-for-height ratio was within the 1990 U.S. guidelines. The study was well done: The accuracy of the BMI measurements was verified, the ascertainment of CHD outcomes was reasonable, and the investigators adjusted for important confounding factors, such as smoking habits.

Although ample support for an association between obesity and the risk for CHD exists in the literature, important controversies remain. Several studies indicate that a large waist-to-hip ratio (an "apple" or android body shape) is more strongly associated with risk for CHD than is BMI (1). Further, the association between obesity and risk for CHD may not be straightforward in older or in African-American women. In older women, increased risk for CHD has been reported both in those with very high BMIs and in those with low BMIs who have lost weight (2). In African-American women, available evidence suggests that there is no association between BMI or body girth and CHD mortality or all-cause mortality (3).

Although controversy remains about the definition of obesity and its relative importance in subgroups of women, these results provide clinicians with additional justification for continuing to recommend weight control.

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