Overdiagnosis of Overweight and Obesity: Cultural Dogma Trumps Evidence-Based Medicine

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"You can never be too rich or too thin."

-- Wallis Simpson, 1896-1986
(American socialite, Duchess of Windsor)

“The greater the BMI, the greater the risk of CVD, type 2 diabetes, and all-cause mortality.”

-- 2013 Obesity Guidelines, Recommendation #1: Advice for adult patients
“...if you looked at any epidemic -- whether it’s influenza, or plague from the Middle Ages -- they are not as serious as the epidemic of obesity in terms of the health impact on our country and our society.”

-- Julie L. Gerberding, Director of the Centers for Disease Control and Prevention, 2003

(The 1918-9 influenza epidemic killed 40 million people worldwide)

(The 1348 plague killed 30% of the population of Europe)
Obesity Tops Cancer In Perception As The Worst U.S. Health Problem

83% of respondents also believe it is more worrisome than alcohol use, tobacco or STDs

CINCINNATI – Americans are more concerned about obesity than any other health problem and 83% think it is the most important health issue in America, according to findings from a survey released today by pollster Repass & Partners.

Read More
Overweight-Obesity: Reweighing the Evidence

QUESTIONS:

- Does mortality increase as body weight increases throughout the overweight-obesity BMI range?
- Is obesity consistently associated with worsened clinical outcomes?
- Does obesity strongly predict cardiac risk?
- Does medical treatment of obesity improve clinical outcomes?
- Does medicalization of obesity do harm?
Overweight-Obesity: Reweighing the Evidence

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## Classification by Body Mass Index

BMI = Weight (kg) / Height (m)\(^2\)

<table>
<thead>
<tr>
<th>Category</th>
<th>BMI</th>
</tr>
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<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
</tr>
<tr>
<td>Normal Weight</td>
<td>18.5 to &lt;25</td>
</tr>
<tr>
<td>Overweight</td>
<td>25 to &lt;30</td>
</tr>
<tr>
<td>Obesity, mild (I)</td>
<td>30 to &lt;35</td>
</tr>
<tr>
<td>Obesity, moderate (II)</td>
<td>35 to &lt;40</td>
</tr>
<tr>
<td>Obesity, extreme (III)</td>
<td>≥ 40</td>
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</tbody>
</table>
Weight Categories, US Population

- Normal Weight
- Overweight
- Obesity
Association of All-Cause Mortality With Overweight and Obesity Using Standard Body Mass Index Categories: A Systematic Review and Meta-analysis

Katherine M. Flegal, PhD  
Brian K. Kit, MD  
Heather Orpana, PhD  
Barry I. Graubard, PhD

The topic of the mortality differences between weight categories has sometimes been described as controversial. The appearance of controversy may arise in part because studies of body mass index (BMI; calculated as weight in kilograms divided by height in meters squared) and mortality have used a wide variety of BMI categories and varying reference categories, which can make findings appear more variable than when standard categories are used and also can make it difficult to compare and synthesize studies. A report in 1997 from the World Health Organization Consultation on Obesity defined BMI-based categories of underweight, normal weight, preobesity, and obesity. The same cutoff BMI values were adopted by the National

Importance Estimates of the relative mortality risks associated with normal weight, overweight, and obesity may help to inform decision making in the clinical setting.

Objective To perform a systematic review of reported hazard ratios (HRs) of all-cause mortality for overweight and obesity relative to normal weight in the general population.

Data Sources PubMed and EMBASE electronic databases were searched through September 30, 2012, without language restrictions.

Study Selection Articles that reported HRs for all-cause mortality using standard body mass index (BMI) categories from prospective studies of general populations of adults were selected by consensus among multiple reviewers. Studies were excluded that used non-standard categories or that were limited to adolescents or to those with specific medical conditions or to those undergoing specific procedures. PubMed searches yielded 7034 articles, of which 141 (2.0%) were eligible. An EMBASE search yielded 2 additional articles. After eliminating overlap, 97 studies were retained for analysis, providing a combined sample size of more than 2.88 million individuals and more than 270,000 deaths.

Data Extraction Data were extracted by 1 reviewer and then reviewed by 3 independent reviewers. We selected the most complex model available for the full sample and used a variety of sensitivity analyses to address issues of possible overadjustment (adjusted for factors in causal pathway) or underadjustment (not adjusted for at least age, sex, and smoking).

Results Random-effects summary all-cause mortality HRs for overweight (BMI of 25–<30), obesity (BMI of ≥30), grade 1 obesity (BMI of 30–<35), and grades 2 and 3 obesity (BMI of ≥35) were calculated relative to normal weight (BMI of 18.5–<25). The summary HRs were 0.94 (95% CI, 0.91–0.96) for overweight, 1.18 (95% CI, 1.12–1.25) for obesity, the summary (all grades combined), 0.95 (95% CI, 0.88–1.01) for grade 1 obesity, and 1.29 (95% CI, 1.18–1.41) for grades 2 and 3 obesity. These findings persisted when limited to studies with measured weight and height that were considered to be adequately adjusted. The HRs tended to be higher when weight and height were self-
# All-Cause Mortality by Standard BMI Categories

**Meta-Analysis – JAMA, 2013**

97 studies; 2.8 million people; 270,000 deaths

<table>
<thead>
<tr>
<th>BMI Category</th>
<th>Hazard Ratio</th>
</tr>
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<tbody>
<tr>
<td>18.5 to &lt;25 (Normal)</td>
<td>1</td>
</tr>
<tr>
<td>25 to &lt;30 (Overweight)</td>
<td>0.94 *</td>
</tr>
<tr>
<td>30 to &lt;35 (Obesity I)</td>
<td>0.95</td>
</tr>
<tr>
<td>≥ 35 (Obesity II, III)</td>
<td>1.29 *</td>
</tr>
</tbody>
</table>

* Significant difference vs. Normal BMI category

Flegal et al., JAMA 2013; 309:71-82
Only Above BMI of 35 does Obesity Predict Increased Mortality
QUESTIONS:

• Does mortality increase as body weight increases throughout the overweight-obesity BMI range?

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“Obesity Paradox” -- Higher BMI Associated with Better Clinical Outcomes

Table 2

<table>
<thead>
<tr>
<th></th>
<th>Obesity Paradox* in Cardiovascular and Noncardiovascular Patients</th>
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<tbody>
<tr>
<td><strong>Cardiovascular</strong></td>
<td></td>
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<tr>
<td>A. Hypertension</td>
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<tr>
<td>B. Heart failure</td>
<td></td>
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<tr>
<td>C. Coronary heart disease</td>
<td></td>
</tr>
<tr>
<td>1) Percutaneous revascularization</td>
<td></td>
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<tr>
<td>2) Coronary artery bypass graft surgery</td>
<td></td>
</tr>
<tr>
<td>3) Treadmill referrals</td>
<td></td>
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<tr>
<td>D. Peripheral arterial disease</td>
<td></td>
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<tr>
<td>E. Echocardiography referrals</td>
<td></td>
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<tr>
<td><strong>Noncardiovascular</strong></td>
<td></td>
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<tr>
<td>A. Elderly</td>
<td></td>
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<tr>
<td>B. End-stage renal disease and dialysis</td>
<td></td>
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<tr>
<td>C. Advanced cancers</td>
<td></td>
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<tr>
<td>D. Chronic obstructive lung disease</td>
<td></td>
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<tr>
<td>E. Rheumatoid arthritis</td>
<td></td>
</tr>
<tr>
<td>F. Human immunodeficiency virus/acquired immune deficiency syndrome</td>
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</tbody>
</table>

*Conditions in which obesity has been associated with a more favorable prognosis compared with that in nonobese patients.

(J Am Coll Cardiol 2009;53:1925-32)
MEDLINE Search: Citations with “Obesity Paradox” in Title or Abstract


236. Can the obesity paradox be explained by the protective effects of peripheral adiposity?. Tanko LB. Christiansen C. Archives of Internal Medicine. 165(15):1796-7; author reply 1797-8, 2005 Aug 8-22.


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Cardiac Risk Assessment Scoring Systems

- Framingham (1998)
- ATP-III (2001)
- Pooled Cohort Equations (2013) (New ACC/AHA statin guidelines)

None Use Obesity (BMI) in Calculating Cardiac Risk

Risk Factors:
- Age, Sex, Systolic-BP, Smoking, Total-Chol, HDL-Chol, Diabetes, anti-HTN-rx
Conclusion:

BMI, waist circumference, and waist-to-hip ratio, assessed singly or in combination, do not importantly improve cardiovascular risk prediction beyond blood pressure, diabetes history, smoking, and lipids.
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Cardiovascular Effects of Intensive Lifestyle Intervention in Type 2 Diabetes

The Look AHEAD Research Group

ABSTRACT

BACKGROUND
Weight loss is recommended for overweight or obese patients with type 2 diabetes on the basis of short-term studies, but long-term effects on cardiovascular disease remain unknown. We examined whether an intensive lifestyle intervention for weight loss would decrease cardiovascular morbidity and mortality among such patients.

METHODS
In 16 study centers in the United States, we randomly assigned 5145 overweight or obese patients with type 2 diabetes to participate in an intensive lifestyle intervention that promoted weight loss through decreased caloric intake and increased physical activity (intervention group) or to receive diabetes support and education (control group). The primary outcome was a composite of death from cardiovascular causes, nonfatal myocardial infarction, nonfatal stroke, or hospitalization for angina during a maximum follow-up of 13.5 years.

RESULTS
The trial was stopped early on the basis of a futility analysis when the median follow-up was 9.6 years. Weight loss was greater in the intervention group than in the control group throughout the study (8.6% vs. 0.7% at 1 year; 6.0% vs. 3.5% at study end).

The authors and their affiliations are listed in the Appendix. Address reprint requests to Dr. Rena Wing at the Weight Control and Diabetes Research Center, Warren Alpert Medical School of Brown University and Miriam Hospital, 196 Richmond St., Providence, RI 02903, or at rwing@lifespan.org.

*A complete list of participants in the Look AHEAD (Action for Health in Diabetes) Research Group is provided in the Supplementary Appendix, available at NEJM.org.

This article was published on June 24, 2013, at NEJM.org.
NIH Look AHEAD Trial: Funding
NEJM 2013; 369:145-54

- National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
- National Heart, Lung, and Blood Institute
- National Institute of Nursing Research
- Office of Research on Women’s Health
- National Center for Minority Health and Health Disparities
- Indian Health Service
- Centers for Disease Control and Prevention (CDC)
NIH Look AHEAD Trial: Summary
NEJM 2013; 369:145-54

- Subjects: T2DM, age 59±7, BMI 36±6
  - 28,622 pre-screened, 9,045 screened
  - N = 5145 randomized
    - Intensified Lifestyle Intervention (calorie restriction + exercise) (n=2,570)
    - Usual diabetes education (n=2,575)

- ILI: weekly counseling sessions for first 6 months; twice monthly for next 6 months; monthly thereafter; vs. usual diabetes education (~3 sessions/year)

- 9.6-year median follow-up (low dropout rate, ~4% each group)

- Primary Composite Endpoint: CV Death, nonfatal MI or CVA, or hospitalization for angina
NIH Look AHEAD Trial: Significant Weight Loss For 10 Years

**NEJM 2013; 369:145-54.**

**Figure 1.** Changes in Weight, Physical Fitness, Waist Circumference, and Glycated Hemoglobin Levels during 10 Years of Follow-up.

Graph A: Weight
- **Control**
- **Intervention**
  - Main effect, $-4$ (95% CI, $-5$ to $-3$) $P<0.001$

Graph B: Physical Fitness
- **Control**
- **Intervention**
  - Main effect, $0.6$ (95% CI, $0.5$ to $0.8$) $P<0.001$

Graph C: Waist Circumference
- **Control**
- **Intervention**
  - Main effect, $-3.2$ (95% CI, $-3.9$ to $-2.4$) $P<0.001$

Graph D: Glycated Hemoglobin
- **Control**
- **Intervention**
  - Main effect, $-0.22$ (95% CI, $-0.28$ to $-0.16$) $P<0.001$
NIH Look AHEAD Trial: Cardiac Events: No Benefit of Weight Loss


Figure 2. Cumulative Hazard Curves for the Primary Composite End Point.
Diabetes Study Ends Early With a Surprising Result

By GINA KOLATA

A large federal study of whether diet and weight loss can prevent heart attacks and strokes in overweight and obese people with Type 2 diabetes has ended two years ahead of schedule because the intensive program did not help.

“I was surprised,” said Rena Wing, the study’s chairwoman and a professor of psychiatry and human behavior at Brown University’s medical school.

Like many, she had assumed diet and exercise would help, in part because short-term studies had found that those strategies lowered blood sugar levels, blood pressure and cholesterol levels.

But, Dr. Wing added, “You do a study because you don’t know the answer.”

Still, medical experts said there were many benefits to diet and exercise even if they did not reduce cardiovascular disease in people with diabetes.

About 25 million Americans have Type 2 diabetes. Many are overweight or obese. On average, the disease increases heart disease risk by 2 to 2 1/2 times, said Dr. Ronald Kahn, chief academic officer at the Joslin Diabetes Center in Boston.

It seemed logical that diet and exercise would help reduce that risk. An earlier federal study found that an intense diet and exercise program helped prevent overweight or obese people with elevated blood sugar levels from crossing the line into diabetes. The hope was that a similar program could also protect people from heart disease.

The study randomly assigned 5,145 overweight or obese people with Type 2 diabetes to either a rigorous diet and exercise regimen or to sessions in which they got general health information. The diet involved 1,200 to 1,500 calories a day for those weighing less than 250 pounds and 1,500 to 1,800 calories a day for those weighing more. The exercise program was at least 175 minutes a week of moderate exercise.

But 11 years after the study began, researchers concluded it was futile to continue — the two groups had nearly identical rates of heart attacks, strokes and cardiovascular deaths.

The investigators are analyzing their data and will be publishing them in research papers.

But the outcome is clear, said Dr. David Nathan, a principal investigator and director of the Diabetes Center at Massachusetts General Hospital. “We have to have an adult conversation about this,” he said. “This was a negative result.”

The study participants assigned to the intensive exercise and diet program did lose about 5 percent of their weight and managed to keep it off during the study. That was enough to reduce cardiovascular risk factors.

“We showed that meaningful weight loss — let’s put ‘meaningful’ in quotes — could be established and maintained,” Dr. Nathan said. “To me that means we did a good experiment. We had a fair test of this hypothesis.”

Some, like Dr. John Buse, director of the University of North Carolina’s diabetes center, said the study confirmed what they would have expected. Dr. Buse, a former president of the American Diabetes Association, said treatments including smoking cessation, statins to reduce cholesterol and blood pressure medications are so powerful that they could swamp the modest effects of weight loss or exercise on cardiovascular risk.

Other medical experts said they were waiting for release of the detailed data collected by the researchers before interpreting the study.

“It is hard to tell anything without the details of the study,” said Dr. Irl Hirsch, medical director of the Diabetes Care Center at the University of Washington.

Dr. Nathan, though, said the results meant that people with diabetes might have a choice. The group assigned to diet and exercise ended up with about the same levels of cholesterol, blood pressure and blood sugar as those in the control group, but the dieters used fewer medications.

“That may be the choice we are highlighting,” Dr. Nathan said. “You can take more medications — and more, I should say, expensive medications — or you can chose a lifestyle intervention and use fewer drugs and come to the same cardiovascular disease risk.”

He is not going to say which is better, Dr. Nathan added. That is up to the individual. But, he said, “those are real choices.”
Does mortality increase as body weight increases throughout the overweight-obesity BMI range?

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Does medicalization of obesity do harm?
“Fat people know that they are fat. You don’t need to tell us; society’s been doing that our whole lives. Many of us have been traumatised by constant reminders about weight loss culture—about how shameful you seem to find our bodies.”

**WHAT YOUR PATIENT IS THINKING**

**Why there’s no point telling me to lose weight**

Emma Lewis

This is one of a new monthly series in which patients and carers set the learning outcomes for readers. For more information contact Rosamund Snow, patient editor, rsnow@bmj.com

I am one of over 97% of people for whom dieting does not lead to sustained weight loss.¹ ² ³

second. It makes me feel like a problem to be solved—something unpleasant that needs to be eliminated. I recently took up weightlifting. I’m happier in myself now—my stamina has increased, as has my strength; I can cycle up hills that used to defeat me.

¹ ² ³
Given the enormous social pressure to lose weight, one might suppose there is clear and overwhelming evidence of the risks of obesity and the benefits of weight loss. Unfortunately, the data linking overweight and death, as well as the data showing the beneficial effects of weight loss, are limited, fragmentary, and often ambiguous.

Given the ambiguous benefits of weight loss, why are physicians and public health officials joining in the general enthusiasm for losing weight? One reason for the medical campaign against obesity may have to do with a tendency to medicalize behavior we do not approve of. In this age of political correctness, it seems that obese people can be criticized with impunity, because the critics are merely trying to help them. Some doctors take part in this blurring of prejudice and altruism by overstating the dangers of obesity and the redemptive powers of weight loss.
Does mortality increase as body weight increases throughout the overweight-obesity BMI range?  ❌ No

Is obesity consistently associated with worsened clinical outcomes?  ❌ No

Does obesity strongly predict cardiac risk?  ❌ No

Does medical treatment of obesity improve clinical outcomes?  ❌ Unproven

Does medicalization of obesity do harm?  ✔ Probably Yes
THE END