The Medical Management of Obesity

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Objectives

• Participants will be able to evaluate patients for current and potential health risks related to obesity.

• Participants will be able to describe the general principles of effective obesity counseling.

• Participants will be able to discuss with patients the skills that can help them take a more active role in their obesity management.
The Obesity Epidemic

- How bad is it?
- What are the causes?
- What are the consequences?
- How effective are treatments?
- Elements needed for long-term success
- Office-based management strategies
- Conclusions
There are 2.9 times more obese Americans compared to 15 years ago.

There are 4-5 times more Americans 100+ lbs. overweight compared to 15 years ago.

2.4 million more people became obese from 2007 to 2009.

CDC Report, State-Specific Obesity Prevalence Among Adults – United States 2009
Increase in Overweight Children

Increase in overweight from NHANES III (1988-1994) to NHANES 2007-2008:

- 72.4% increase for 12-19 year-olds
- 73.5% increase for 6-11 year-olds
- 44.4% increase for 2-5 year-olds

JAMA 2002;288:1728-1732
JAMA 2004;291:2847-2850
JAMA 2006;295:1549-1555
JAMA 2008;299:2401-2405
JAMA 2010;303:242-249
Prevalence of Self-Reported Obesity Among U.S. Adults
BRFSS, 2011
Increase in Overweight Adults in U.S.

The most recent NHANES data show that 68.8%* of Americans are overweight or obese.

*35.7% are obese
33.1% are overweight (pre-obese)
31.2% are not overweight

JAMA 2012;307:491-497
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Etiologies of Obesity

Genetic

Disease

Lifestyle

Environment
Etiology of Obesity

“Obesity can develop only from an excess of energy intake over expenditure.”


“For weight loss, only calories count.”

Americans are Eating More Often

A 30-year study from the National Institutes of Health found:

Americans eat 570 more calories per day than they did in the 1970s.

“While increased portion sizes have had a major impact, it appears that the increased number of eating occasions is now driving this change.”

BURGERS 1st BREAKFAST
Burgers & Fries Available from 7AM on.
Portion Sizes Have Never Been Bigger

A 30-year study of 31,000 people found that the portion sizes of soft drinks, fruit drinks, salty snacks, desserts, French fries, burgers, pizza, Mexican fast food and hot dogs have all significantly increased.

J Nutr 2011;141:1159-1164
The Double Quarter Pounder with Cheese

The Triple Whopper

The Monster Thickburger

Original Double Cheeseburger
Genetics loads the gun; the environment pulls the trigger.
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Medical Complications of Obesity

Pulmonary disease
- abnormal function
- obstructive sleep apnea
- hypoventilation syndrome
- nocturnal aspiration syndrome

Nonalcoholic fatty liver disease
- steatosis
- steatohepatitis
- cirrhosis

Gall bladder disease

Gynecologic abnormalities
- abnormal menses
- infertility
- polycystic ovarian syndrome

Osteoarthritis

Gout

Skin

Phlebitis
- venous stasis

Coronary heart disease

Diabetes

Dyslipidemia

Hypertension

Cancer
- breast, uterus, cervix
- colon, esophagus, pancreas
- kidney, prostate

Severe pancreatitis

Idiopathic intracranial hypertension

Stroke

Cataracts

www.obesityonline.com
Health Consequences of Obesity

- Obese
  - Cardiovascular
    - Congestive HF
    - Hypertension
    - Cerebrovascular
    - Coronary artery disease
  - Diabetes
  - Gallbladder
  - Osteoarthritis
  - Sleep Apnea
  - Cancer
  - Female reproductive
  - Psychosocial and Emotional
Metabolic Syndrome: Impact on Mortality

*P < 0.001.

The Cost of Obesity and its Co-morbidities

• Obesity Care May Cost Twice Previous Estimates.  
  *J Health Econ* 2012;31:219-230

• Obesity adds about $28,000 to a person’s medical bills over a 10-year period.  
  *J Health Econ* 2012;31:219-230

• Healthcare costs for a person with diabetes are 2.7 times greater than for a person without diabetes and, for those diabetics with complications, it is 4.7 times greater. UnitedHealth Working Paper 5. The United States of Diabetes, November 2010

• Obese employees spend 77% more on medications than non-obese employees.  
  [www.cdc.gov/leanworks/why/](http://www.cdc.gov/leanworks/why/)
An obese person incurs medical costs that are $2,741 higher (in 2005 dollars) than if they were not obese, according to the newest study. Nationwide, that translates into $190.2 billion per year, or 20.6 percent of national health expenditures.
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Obesity Treatment

• Comprehensive lifestyle intervention
  – Diet: reduced calorie intake (consider meal replacements)
  – Physical activity
  – Behavioral strategies
  – Maintenance

• Pharmacotherapy: adjunctive

• Surgery

2013 AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults
Comparative Effectiveness

Anderson JW. Combination approaches to weight management. Medscape Diabetes & Endocrinology 6(2), 2004
What Is Medically-Significant Weight Loss?

Example:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial weight:</td>
<td>240 lbs.</td>
</tr>
<tr>
<td>5% of initial weight:</td>
<td>-12 lbs.</td>
</tr>
<tr>
<td>10% of initial weight:</td>
<td>-24 lbs.</td>
</tr>
</tbody>
</table>

http://www.nhlbi.nih.gov/guidelines/index.htm
Greater Initial Weight Loss Improves Long-term Success
A Meta-Analysis of 29 U.S. Studies of Structured Weight-Loss Programs

“Greater initial weight loss increases total weight loss and improves long-term maintenance.”


Myths, Presumptions, and Facts about Obesity

Krista Casazza, Ph.D., R.D., Kevin R. Fontaine, Ph.D., Arne Astrup, M.D., Ph.D., Leann L. Birch, Ph.D., Andrew W. Brown, Ph.D., Michelle M. Bohan Brown, Ph.D., Neerati Durant, M.D., M.P.H., Gareth Dutton, Ph.D., E. Michael Foster, Ph.D., Steven B. Heymsfield, M.D., Kerry McInerney, M.S., Tapan Mehta, M.S., Nir Menachem, Ph.D., P.K. Newby, Sc.D., M.P.H., Russell Pate, Ph.D., Barbara J. Rolls, Ph.D., Bisakha Sen, Ph.D., Daniel L. Smith, Jr., Ph.D., Diana M. Thomas, Ph.D., and David B. Allison, Ph.D.

ABSTRACT

BACKGROUND

Many beliefs about obesity persist in the absence of supporting scientific evidence (presumptions); some persist despite contradicting evidence (myths). The promulgation of unsupported beliefs may yield poorly informed policy decisions, inaccurate clinical and public health recommendations, and an unproductive allocation of research resources and may divert attention away from useful, evidence-based information.

METHODS

Using Internet searches of popular media and scientific literature, we identified, reviewed, and classified obesity-related myths and presumptions. We also examined facts that are well supported by evidence, with an emphasis on those that have practical implications for public health, policy, or clinical recommendations.

RESULTS

We identified seven obesity-related myths concerning the effects of small sustained increases in energy intake or expenditure, establishment of realistic goals for weight loss, rapid weight loss, weight-loss readiness, physical-education classes, breast-feeding, and energy expended during sexual activity. We also identified six presumptions about the purported effects of regularly eating breakfast, early childhood experiences, eating fruits and vegetables, weight cycling, snacking, and the built (i.e., human-made) environment. Finally, we identified nine evidence-supported facts that are relevant for the formulation of sound public health, policy, or clinical recommendations.
### Review of studies in support of greater initial weight loss accompanying greater sustained weight loss

<table>
<thead>
<tr>
<th>Program</th>
<th>VLCD + Behavioral Support</th>
<th>Behavioral Support alone</th>
<th>Mostly HMR and Optifast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Design</td>
<td>RCT</td>
<td>Meta-Analysis, observational</td>
<td></td>
</tr>
<tr>
<td>Participants</td>
<td>59 Adults; BMI ≥ 40</td>
<td>29 studies</td>
<td></td>
</tr>
<tr>
<td>Weight Loss Intervention</td>
<td>VLCD and Behavioral Modification Classes</td>
<td>Behavioral Modification Alone</td>
<td>VLCD and weekly behavioral modification classes</td>
</tr>
<tr>
<td>Length of Weight Loss Intervention</td>
<td>16 weeks</td>
<td>Mean 19 weeks</td>
<td></td>
</tr>
<tr>
<td>Weight Loss</td>
<td>↓22.9 kg</td>
<td>↓8.9 kg</td>
<td>↓24.1 kg</td>
</tr>
<tr>
<td>Maintenance Intervention</td>
<td>none</td>
<td>9 of 29 studies provided maintenance intervention</td>
<td></td>
</tr>
<tr>
<td>Follow-up</td>
<td>5 Years</td>
<td>4.5 years</td>
<td>4.5 years</td>
</tr>
<tr>
<td>Participants available for follow up</td>
<td>12</td>
<td>16</td>
<td>578</td>
</tr>
<tr>
<td>Weight Change</td>
<td>↓16.9 kg</td>
<td>↓4.9 kg</td>
<td>6.6% of initial body weight</td>
</tr>
<tr>
<td># (%), sustaining ≥ 10% initial weight</td>
<td>4 (33%)</td>
<td>5 (31%)</td>
<td>not reported</td>
</tr>
</tbody>
</table>

### Medication Changes & Cost Reductions with Substantial Weight Loss in an LCD Program

<table>
<thead>
<tr>
<th></th>
<th>Obese n=83</th>
<th>Severely Obese n=100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg weight loss</td>
<td>↓ 41.4 lbs</td>
<td>↓ 130.1 lbs</td>
</tr>
<tr>
<td>Total # medications/day</td>
<td>↓ 43%</td>
<td>↓ 72%</td>
</tr>
<tr>
<td>Medication dosages</td>
<td>↓ 46%</td>
<td>↓ 79%</td>
</tr>
<tr>
<td>Avg monthly medication costs</td>
<td>↓ 38%</td>
<td>↓ 72%</td>
</tr>
<tr>
<td>First year savings</td>
<td>$952</td>
<td>$1,883</td>
</tr>
<tr>
<td>Each subsequent year savings</td>
<td>$1,152</td>
<td>$2,064</td>
</tr>
</tbody>
</table>

Note: these estimates are conservative since reductions in medication costs likely “represent less than half the total health care cost savings.” (p. 5)

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Long-term Weight Loss and Maintenance

• There is a great deal of evidence that weight loss is a key element in the prevention of chronic illness as well as in the stabilization or reversal of conditions like diabetes and hypertension.

• An increasing body of research points to the behaviors required to maintain significant weight loss over time.

• Consistency, accountability, self-monitoring, low-fat eating and physical activity are among the variables that predict long-term success.

Attendance:
Accountability is Critical

The major finding of a review of 105 studies indicated that the amount of treatment in terms of duration and quantity was the most important aspect in determining successful weight management.

Bennett GA. Behavior therapy for obesity: a quantitative review of the effects of selected treatment characteristics on outcome. *Behav Ther* 1986;17:554-562
“It has become abundantly clear that efforts to help clients become the best self-monitors they can be may prove critical to helping them lose weight and maintain weight losses.”


“…self-monitoring, and perhaps ‘obsessive-compulsive self-regulation,’ are necessary for successful weight control.”

Physical Activity: National Weight Control Registry

N = 3,683

Those keeping off 30 lbs. or more (current average is 71 lbs.) for an average of 5.8 years, average 2,621 kcals per week of physical activity.

American Cancer Society
10 year study, N = 80,000

The two variables that best predicted success in weight management:

- High levels of physical activity
- More than 20 servings of vegetables per week

Ten-year Self-management of Weight Using a Meal Replacement Diet Plan

After 10 years, those using meal replacements weighed 32.6 pounds less than matched controls who did not use meal replacements.

No other treatment was given and no meetings occurred with the researchers during this time.

Efficacy of Meal Replacements for Long-term Weight Control

“The use of portion-controlled servings, including meal replacements, currently has the strongest evidence of long-term efficacy.”

Wadden TA, Butryn ML, Byrne KJ. Obes Res. 2004;12:151S-162S
One-Year Weight Maintenance Using Meal Replacements
KU Weight Management Program

LeCheminant JD, Jacobsen DJ, Hall MA, Donnelly JE. J Am Coll Nutr 2005;24:347-353
Average weight change from initial: 42 lbs. (17.2%)

Average time between HRAs: 140 weeks (2.7 years)

Compare to “gold standard” for weight loss & maintenance: 8% of initial body weight for up to 1 year.

* Data reflect measured risk factors from the HMR health risk assessment database
Successful Weight Intervention May Have an Impact on These Health Risks

Impact of 5-10% Weight Loss on Risk Factors

- HbA1c\(^1\)
- Blood Pressure\(^2\)
- Total Cholesterol\(^3\)
- HDL Cholesterol\(^3\)
- Triglycerides\(^4\)

References:
Effects of Dietary Intervention in Long-Term Insulin Requiring Diabetics

21 subjects on insulin
Average duration of diabetes: 17 years
Baseline BMI: 36.4; Baseline HbA1c: 9.0

<table>
<thead>
<tr>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly PA = 500 kcal.</td>
<td>Weekly PA = 2,100 kcal.</td>
</tr>
<tr>
<td>Avg. V/F = 15 servings/week</td>
<td>Avg. V/F = 35+ servings/week</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medical Risk Factors</th>
<th>Change in Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Loss</td>
<td>- 20.2 lbs.</td>
</tr>
<tr>
<td>HbA1c</td>
<td>↓ 1.2%</td>
</tr>
<tr>
<td>Insulin Dose</td>
<td>↓ 14.1 units/day</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>↓ 78.8 mg/dL</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>↓ 15.4 mm</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td>↓ 8.1 mm</td>
</tr>
<tr>
<td>Waist Circumference</td>
<td>↓ 3.3 inches</td>
</tr>
</tbody>
</table>

Reynolds LR, Konz EC, Frederich RC, Anderson JW. *Diabetes Obes Metab* 2002;4:270-275
Key Research-based Behaviors for Obesity Treatment

Processes
1. Attendance
2. Daily record keeping

Procedures
1. Increase physical activity
2. Consume a high number of servings of vegetables/fruits, including legumes
3. Use meal replacements to help reduce calories for both weight loss and weight loss maintenance
A Review of 94 HMR Studies Found:

- Consistent weight loss reductions of 15-22% over 16-30 weeks.
- Consistent 15% - 20% weight loss with follow-up of 2-3 years for maintenance patients.
- Consistent and substantial improvements in waist circumference, lipid and glucose parameters, and blood pressure.
- Reductions in use of medications for dyslipidemia, hypertension, and diabetes.
- Long-term behavioral improvements (more exercise, more fruit/vegetable and meal replacement consumption, less fat intake).

* Included review of abstracts and controlled studies.
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Office-Based Management
Strategies

• Assuming we’ve made the case for weight management, how do we begin to integrate it into the practice of medicine?

• A simple paradigm for obesity-related counseling comes from the Counseling and Behavioral Interventions Workgroup of the USPSTF

• They recommend a useful framework known as the 5 A’s: – Assess, Advise, Agree, Assist, Arrange

• There is a critical role for physicians – they must keep the patient engaged regardless of what program they are in!

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Conclusions: Obesity Epidemic is a Crisis

- Prevention will not rescue current overweight/obese individuals

- Lifestyle/dietary interventions can be effective:
  - Require consistency and accountability
  - Empathetic support, guidance
  - Self-monitoring
  - Physical activity
  - Low-fat, high-quality nutrition

- Effective treatment requires time and structure

- Don’t be afraid to refer
Long-term Weight Loss is Improved with Long-term Maintenance Therapy

The long-term treatment of obesity is a marathon, not a sprint.
Thanks for inviting me!