Nutrition, Obesity and Cardiovascular Disease

Abeer Bader MSc, RD, LDN, CSOWM
abader@mgh.harvard.edu

Massachusetts General Hospital - Weight Center
Disclosure

- I have nothing to disclose.
Objectives

- Review the complexity of obesity and review lifestyle, medical and surgical treatment options
- Recognize nutritional components of a heart-healthy diet
- Discuss practical strategies towards a healthy lifestyle
What is Obesity?

- Obesity officially recognized as a disease by American Medical Association on June 18, 2013
- Excess fat accumulation that may cause an adverse effect on health
- **Common measure**
  - Body Mass Index (BMI) = kg/m$^2$
    - Overweight: 25 - 29.9 kg/m$^2$
    - Obesity: ≥30 kg/m$^2$
- Independent risk factor for CVD
  - WC (>88 cm female, >102 cm male)
  - WHR (>0.85 female, >0.90 male)
Overweight and Obesity Trends

- 71.6% of US adults have Overweight/Obesity
- 39.8% of US adults with Obesity
  - 93.3 million adults
- 35.7% among adults aged 20 to 39 years
- 42.8% among adults aged 40 to 59 years
- 41.0% adults aged 60 and older

Content source: Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion
Prevalence of Self-Reported Obesity Among U.S. Adults by State and Territory, 2016-2018

33%

Content source: Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion
Prevalence of Self-Reported Obesity Among Non-Hispanic White Adults

Content source: Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion
Prevalence of Self-Reported Obesity Among Hispanic Adults

Content source: Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion
Prevalence of Self-Reported Obesity Among Non-Hispanic Black Adults

Content source: Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion
Contributors to Weight Gain

Genetics 40-70%

- Genetics
- Environment
- Dietary Intake
- Sedentary
- Stress Psychology
- Family Work Financial BED Depression
- Transportation Desk Jobs TV Viewing Convenience Cost
- Processed Food Intake Portion Distortion Convenience Cost Culture/Ethnicity
- Food Availability/Accessibility Advertisements Transportation Endocrine Disrupting Chemicals

- Insulin, Sulfonylureas, TZD’s
- Beta and a blockers
- Corticosteroids
- Antihistamines
- Hormonal Contraceptives

- Puberty
- Pregnancy
- Menopause
- Shift Work Electronics

- Develop. Stages
- Sleep

- Desk Jobs
- TV Viewing
- Culture/Ethnicity

- Financial
- BED
- Depression
57 Varieties of Obesity

Leptin deficiency
Lepr deficiency
POMC deficiency
MC4R deficiency
aMSH deficiency
Sim-1 deficiency
PC-1 deficiency
KSR2 deficiency
MRAP2 deficiency
SH2B1 deficiency
BDNF deficiency
TrkB deficiency
Carpenter syndrome
Cohen syndrome
Ayazi syndrome
MOMO syndrome
Rubenstein-Taybi syndrome
Fragile X syndrome
Albright osteodystrophy
Prader-Willi syndrome
Bardet-Biedl syndrome
Alström syndrome
BFL syndrome
Hypothalamic
Hyperphagic
Thermogenesis deficient
Circadian-disrupted
Stress-induced
Viral
Central
Peripheral
Diffuse
Neonatal
Early childhood
Peripubertal
Gestational
Menopausal
"Healthy"
Metabolic

Inflammatory
Diet-dependent
Exercise-sensitive
Sleep-sensitive
Insulin-induced
Steroid-induced
Progesterone-induced
Psychotropic-induced
Antibiotic-induced
Endocrine disruptor
Phentermine-responsive
Lorcaserin-responsive
Topiramate-responsive
Metformin-responsive
Bupropion-responsive
GLP-1 responsive
Bypass-responsive
Bypass-resistant
Gastric band-responsive

Adapted from Kaplan L, presentation at the 29th Blackburn Course in Obesity Medicine, June 2, 2016
Obesity Related Co-Morbidities

- Cardio Disease
- Dyslipid.
- Diabetes
- NAFLD
- Sleep Apnea
- GERD
- Asthma
- Depression
- Migraines
- Some Cancers
- Arthritis

OBESITY
Sustained Weight Loss of 5-10% Total Body Weight Improves Health

- Improves cholesterol
- Lowers triglycerides
- Lowers blood pressure
- Lowers blood sugar
- Improves reflux
- Improves sleep apnea
- Decreased need for certain medications

In overweight/obesity with or without cardio risk, dose response:
- ✓ 3 kg weight loss, 15 mg/dl reduction in TG
- ✓ 5-8 kg weight loss, 5 mg/dl reduction in LDL, 2-3 mg/dl increase in HDL

In overweight/obesity at risk for type T2DM
- ✓ 2.5 – 5.5 kg weight loss, reduce T2DM progression by 30-60%

Content source: 2013 AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults. AHA/ACC/TOS Prevention Guideline
Obesity Interventions

SURGICAL
- ~30% TBW loss

MEDICAL
- ~10% TBW loss

LIFESTYLE
- ~5% TBW loss

Health Risks
BMI

Treatment Intensity
Nutrition Intervention for Improved Body Weight and Heart Health

- Caloric Restriction
- Intermittent Fasting
- Mediterranean
- DASH Diet
- Plant Based
- Low Carb? Low Fat?
  - Cardio Health: Lower carbohydrate shows greater reduction in triglyceride and larger increase in HDL than low fat

Factors to consider:

✓ Individualized Needs (Preference, Health, Finance, Culture, Accessibility)
Nutrition Intervention

- **Recommended Caloric Intake for Weight Loss**
  - Females: 1200 - 1500 kcal/d
  - Males: 1500 - 1800 kcal/d

- **Caloric Deficit**
  - 500 - 1000 kcal/d reduction

- **Meal Replacements**
  - High degree of Structure, Convenience, Portion Controlled; *Monotonous, Cost*
    - **Low Calorie Diet (LCD):** 800 - 1000 kcal/d, medically monitored
      - 9.7% BW reduction at 4 months, 6.3% reduction at 1 year
    - **Very Low Calorie Diet (VLCD):** ≤ 800 kcal/d, medically monitored
      - 16.1% reduction at 4 months, 5.0% reduction at 1 year
Determining Energy Needs

Referral to Obesity trained RD recommended

1. Indirect Calorimetry (Golden Standard)
2. Mifflin St Jeor Equation
   - Men
     \[ 10 \times \text{weight (kg)} + 6.25 \times \text{height (cm)} - 5 \times \text{age (y)} + 5 \]
   - Women
     \[ 10 \times \text{weight (kg)} + 6.25 \times \text{height (cm)} - 5 \times \text{age (y)} - 161 \]

   - Add Activity Factor once RMR/BMR determined
   - Subtract 500 - 1000 kcal/d for weight loss
Implementing Nutrition Intervention in Practice

- For weight loss it is recommended that patients have at least ≥14 visits in a period of 6 months
  - Group Education
  - Individual MNT
  - Electronic (ideal to have behavioral component as face to face more effective)
- For weight maintenance it is recommended that patients come in monthly for at least 1 year

Achieving weight loss requires commitment from patients
Heart Healthy Diet

- Avoid Trans Fat
- Limit Saturated Fat
- Replace with Unsaturated Fat
- Omega-3
  - Cold Water Fatty Fish (+2x/wk)
- Dietary Fiber (25-50 g/d)
  - Fruits (2-3 servings/d)
  - Vegetables (+3 servings/d)
  - Legumes (Meatless Mondays?)
  - Grains (Barley, Freekeh, Quinoa)
- Water

MONOUNSATURATED FAT
- Olive Oil
- Nuts/Seeds
- Avocado

SATURATED FAT
- Red Meat
- Eggs
- Dairy
- Palm Kernel Oil

TRANS FAT
- Packaged Foods
- Hydrogenation

Avoidance of SSB, Excessive alcohol, Refined Carbohydrates, Processed Meats, Fried Foods

Abeer Bader, RD
Barriers to Healthy Eating

- Time
  - Lack of time to prepare foods
  - Work and commuting demands
- Cost
  - Fast food, non-perishables - cheaper
- Convenience
- Cooking Skills

ADDRESS BARRIERS
+ SET REALISTIC INDIVIDUALIZED GOALS
Predictors of Weight Maintenance

- 98% of participants modified their food intake
  - Track food, count calories
  - Less than 30% calories from fat, limit eating OUT
- 94% increased their physical activity (walking)

Predictors in Weight Maintenance:

- 78% eat breakfast every day
  - Eat similar food regularly
- 90% exercise, on average, about 1 hour per day
- 75% weigh themselves at least once a week
- 62% watch less than 10 hours of TV per week

Content source: National Weight Control Registry
Physical Activity Guidelines

- **Health Benefits**
  - 150 minutes minutes of aerobic physical or 75 minutes of vigorous physical activity + strength training
    - Moderate: can talk but difficulty singing
    - Vigorous: difficulty talking

- **Weight Maintenance or Weight Loss**
  - 300 minutes of aerobic physical activity weekly + strength training

- **Strength Training Recommendation:**
  - 20 - 30 minutes resistance physical activity 2-3 times per week

What about the rest of the day? Activity of Daily Living
Physical Activity Practical Tips

- Baseline level of activity
- Barriers to activity
  - Physical limitations?
  - Financial? Time? Weather?
- SMART Goal Setting
  - Specific
  - Measurable
  - Attainable
  - Realistic
  - Timely

ADDRESS BARRIERS + SET REALISTIC INDIVIDUALIZED GOALS
Medical Intervention

- **Indications**
  - BMI $\geq 27$ kg/m$^2$ + Co-morbidity
  - BMI $\geq 30$ kg/m$^2$

- **Weight loss Medications Mechanism of Action:**
  - Decrease hunger
  - Increase satisfaction with less food
  - Reduce bingeing and cravings
  - Reduce preoccupation with food
  - Inhibits fat digestions/absorption
  - Possibly increase metabolism

- In combination with lifestyle changes
- Long-term use to maintain weight loss
- Combination medications may be necessary
# Medical Intervention

**FDA APPROVED**

<table>
<thead>
<tr>
<th>Weight-Loss Medications</th>
<th>% Wt Loss</th>
<th>Mechanism</th>
<th>Contraindication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phentermine</td>
<td>-</td>
<td>Reduce hunger through norepinephrine release</td>
<td>CVD, uncontrolled HTN, hyperthyroidism, hx drug abuse, MAOI, tricyclic antidepressants, pregnancy</td>
</tr>
<tr>
<td>Lorcaserin (Belviq)</td>
<td>3.0-3.6%</td>
<td>Reduce hunger, increase satiety by activating serotonin receptor in brain</td>
<td>Congestive heart failure, pregnancy</td>
</tr>
<tr>
<td>Liraglutide (Saxenda)</td>
<td>5.6%</td>
<td>Increase length of satiety by decrease rate of gastric emptying, affects glucose homeostasis, GLP-1</td>
<td>Medullary thyroid cancer, pregnancy</td>
</tr>
<tr>
<td>Orlistat (Xenical)</td>
<td>4.0%</td>
<td>Lipase inhibitor prevents fat absorption</td>
<td>Cholestasis, malabsorption issues, pregnancy</td>
</tr>
<tr>
<td>Naltrexone + Bupropion (Contrave)</td>
<td>4.2-5.2%</td>
<td>Reduce hunger and food craving Naltrexone - opiate antagonist Bupropion - suppresses appetite, reuptake inhibitor of dopamine and norepinephrine</td>
<td>Uncontrolled HTN, seizure disorder, MAOI, pregnancy</td>
</tr>
<tr>
<td>Phentermine + Topiramate (Qsymia)</td>
<td>6.6%</td>
<td>Topiramate - reduces appetite and food cravings by augmenting activity of GABA</td>
<td>CVD, uncontrolled HTN, hyperthyroidism, hx drug abuse, MAOI, tricyclic antidepressants, pregnancy</td>
</tr>
</tbody>
</table>

Lifestyle intervention must continue typically discontinue if less than 3-5% weight loss in 12 weeks.
Medical Intervention
OFF LABEL USE

- Metformin
- Victoza
- Exenatide
- Topiramate
- Zonisamide
- Bupropion
- Naltrexone
Surgical Intervention

- **Indications:**
  - BMI $\geq 35$ kg/m$^2$ + Obesity Related Co-Morbidity
  - BMI $\geq 40$ kg/m$^2$

- **Most effective long-term therapy for obesity**

- Metabolic therapy leading to significant improvement/remission of disease caused by obesity including cardiovascular disease and diabetes

- Increased life expectancy by 89%
Surgical Intervention
Gastric Balloon

- **Indications:**
  - BMI 30 - 40 kg/m²
  - Endoscopic procedure; balloon inserted in stomach and filled with saline
    - Must be removed 6 month post insertion
  - Not covered by insurance ~$10,000
  - EWL ~20%

Surgical Intervention
Gastric Band

- Re-operation rate is ~25%, up to 60% at 10 years due to:
  - Band slippage/erosion
  - Band port/site infection
  - Intolerance of band
  - Inadequate weight loss
- EWL of ~45%

Image Resource: https://www.ormc.org/services/surgery/bariatric/gastric-banding
Surgical Intervention
Gastric Sleeve

- Most commonly performed
- ~80% of the stomach removed
- Restrictive and Metabolic
- Lower complications
- Lifelong need for vitamin and minerals
- EWL of ~55%

Image Resource: https://www.ormc.org/services/surgery/bariatric/sleeve-gastrectomy
Surgical Intervention
Roux-en-Y Gastric Bypass

- Alteration of food pathway
- Restrictive and Metabolic
- More complications than sleeve
  - Dumping syndrome
- Lifelong need for vitamin and minerals
- EWL ~70%

Image Resource: https://www.ormc.org/services/surgery/bariatric/gastric-bypass
Co-Morbidity Reduction After Bariatric Surgery

- Migraines: 57% resolved
- Pseudotumor cerebri: 96% resolved
- Dyslipidemia, hypercholesterolemia: 63% resolved
- Non-alcoholic fatty liver disease: 90% improved or resolved
- Asthma: 82% improved or resolved
- Cardiovascular disease: 82% risk reduction
- Hypertension: 52-92% resolved
- GERD: 72-98% resolved
- Stress urinary incontinence: 44-88% resolved
- Degenerative joint disease: 41-76% resolved

Quality of life improved in 95% of patients
Mortality: 89% reduction in 5-year mortality
Lifestyle Recommendations for Patients

✓ Self-Monitoring
  ▪ Keep track of food/beverage intake
  ▪ Physical activity
  ▪ Weight

✓ Plan Ahead
  • Structured meals (Quality, Protein + Fiber)
  • Carry health snack
  • Review restaurant menu

✓ Mindfulness
  • Head versus physical hunger

✓ Sleep 8 hours
✓ 60 minutes walking most days in the week *(helps with stress too)*
✓ Find Support
✓ Don’t give up
  ▪ Long-term disease, requires lifestyle changes and weight maintenance

Practice the basics of self-care
Know you have the right to be healthy and happy
Recommendations in Treatment of Obesity

- Prevent Weight bias
- Understand Weight Trend and Timeline
  - Address trend with patient
  - Acknowledge weight maintenance
- Severity of Obesity
  - Discussion with patients re appropriate treatment options
    - Get thorough weight hx to better treatment plan
    - Open ended questions re previous weight loss attempts, readiness, confidence in treatment plan

How to Prevent Weight Bias?
- People First Language
- Appropriate Size Chairs
- Appropriate BP Cuff Size
- Obesity Complex

Avoid blame and simplicity of only needing to eat less and be PA
# Obesity Treatment, Beyond the Guidelines

## Practical Suggestions for Clinical Practice

Scott Kahan, MD, MPH\(^1,2\); JoAnn E. Manson, MD, DrPH\(^3,4\)

**Author Affiliations**


## Table. An “ABCDEF” Approach to Guide Weight Counseling in Primary Care

<table>
<thead>
<tr>
<th>Steps</th>
<th>What to Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask “permission”</td>
<td>- Assess patient readiness to discuss weight issues. Consider beginning the conversation with questions such as, &quot;Your weight has been increasing over the years, which could lead to diabetes and other health problems. Would it be okay if we started working together on this?&quot;</td>
</tr>
<tr>
<td>Be systematic in the clinical workup</td>
<td>- Elicit weight history, motivations, barriers, and social determinants.</td>
</tr>
<tr>
<td></td>
<td>- Medications that may cause weight gain include some antidepressants, antipsychotics, insulin, sulfonylureas, steroids, and pain medications.</td>
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<tr>
<td>Counseling and support</td>
<td>- A wide range of dietary patterns can help weight management.</td>
</tr>
<tr>
<td></td>
<td>- Physical activity, even just walking, is essential for health.</td>
</tr>
<tr>
<td></td>
<td>- Use free online tools and resources, such as Dietary Guidelines for Americans, obesity treatment guidelines, and the Diabetes Prevention Program curriculum and handouts.</td>
</tr>
<tr>
<td>Determine health status</td>
<td>- Evaluate for weight-related health conditions (eg, diabetes, sleep apnea), physical limitations, and decreased quality of life.</td>
</tr>
<tr>
<td>Escalate treatment when appropriate</td>
<td>- Consider medication (BMI ≥27) or bariatric surgery (BMI ≥35) when weight-related health conditions are present.</td>
</tr>
<tr>
<td></td>
<td>- Medication options for long-term use include orlistat, lorcaserin, phentermine/topiramate-extended release, naltrexone/bupropion-sustained release, and liraglutide.</td>
</tr>
<tr>
<td>Follow up regularly and leverage available resources</td>
<td>- Create a care team by identifying local obesity specialists (eg, obesity medicine physicians, registered dietitians), community programs (eg, YMCA-based diabetes prevention program), and other resources (eg, commercial weight-loss programs, health coaches, digital or telehealth platforms).</td>
</tr>
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<td></td>
<td>- A few minutes at the end of an unrelated appointment can be used to check in on patients’ progress and offer support.</td>
</tr>
<tr>
<td></td>
<td>- Utilize medical assistants and other office staff to save time by assisting with patient education, monitoring, and coordinating care.</td>
</tr>
</tbody>
</table>
Recommendations in Treatment of Obesity

- Interdisciplinary Team
  - Referral to appropriate person
  - No one practitioner can provide all the skills necessary
  - Familiarize self with Weight Management programs in area

- Client Centered Care
  - Structure to treatment plan
  - Frequent visits

- Accountability/ Additional Support
  - Apps/ Telehealth
  - Group meetings

- Obesity treatment is challenging, lifelong commitment to improved health
Questions?

Abeer Bader
abader@mgh.harvard.edu