Nutritional Aspects of Obesity Management

Christy Olson MS, RD, LD, CDE
Relevant Disclosure and Resolution

Under Accreditation Council for Continuing Medical Education guidelines disclosure must be made regarding relevant financial relationships with commercial interests within the last 12 months.

Christy Olson MS RD, LD, CDE

I have no relevant financial relationships or affiliations with commercial interests to disclose.
Rise in Obesity Rates

- Obesity increased significantly in men and women between 1980-2000.

- Obesity and extreme obesity increased significantly among women, but no significant increases among men between 2005-2014.


NOTES: Age-adjusted by the direct method to the year 2000 U.S. Census Bureau estimates using age groups 20–39, 40–59, and 60–74. Overweight is body mass index (BMI) of 25 kg/m² or greater but less than 30 kg/m²; obesity is BMI greater than or equal to 30; and extreme obesity is BMI greater than or equal to 40. Pregnant females were excluded from the analysis.

SOURCES: NCHS, National Health Examination Survey and National Health and Nutrition Examination Surveys.
Staggering Statistics Today

- More than two-thirds of adults in the United States are considered to be overweight or obese
- More than one-third of adults are obese
- This has fueled a weight loss industry worth $66.3 billion dollars
- Last year the NIH provided an estimated $931 million in funding for obesity research
The History of Dieting

- Turn of the 20th Century - Horace Fletcher, popular nutrition expert recommended chewing food until liquefied, up to 722 times before swallowing

- President William Howard Taft - kept a daily food log with a low-fat, low calorie eating plan after he got stuck in a White House bath tub

- World War I - government encouraged calorie counting because of a global food shortage
The History of Dieting

• 1930’s- Grapefruit Diet
• 1950’s- Cabbage Soup Diet along low-calorie meal plans
• 1960’s- Massive commercialization of dieting- Weight Watchers was started by a New York housewife named Jean Nidetch
The History of Dieting

• 1970’s- counting calories- based on incorrect advice that eating fat will make you fat

• 1990’s- adults with obesity made up less than 15% of the U.S. population

• 2010’s- most states were reporting obesity in 25% or more of their populations
Causes of Obesity

- Socioeconomic status
- Portion distortion
- Stress
- Medications
- Lifestyle
- Environment
- Genes
- Metabolism
- Education level
- Hormonal disorder
Physician Visits

• A University of Georgia study found patients are more motivated to lose weight after their doctors advised them to do so

• Another study showed that patients are more likely able to understand their weight and try to lose weight after talking to their doctor
Identify Patients Who Need to Lose Weight

• Weight loss indicated for
  – Obese individuals
  – Overweight individuals with one indicator for cardiovascular disease risk such as pre-diabetes, diabetes, hypertension, dyslipidemia, elevated waist circumference, or other obesity related comorbidities
Body Mass Index

1. BMI Formula:
   \[(\text{Weight (lbs)} / \text{Height (in)}^2) \times 703\]

2. BMI Index Chart
   - Normal Weight: 18.5 to 24.9
   - Overweight: 25.0 to 29.9
   - Obese: \(\geq 30.0\)
   - Severe Obesity: \(\geq 40.0\)
Waist Circumference

Goal

- <40 inches or < 102 cm in men
- <35 inches or < 88 cm in women
Three Dietary Strategies for Weight Loss

Prescribe

• Women-1200-1500 kcal/day
  Men-1500-1800 kcal/ day

• 500-1,000 kcal/day energy deficit

• One of the evidence based diets that restricts certain food types in order to reduce caloric intake
Energy Expenditure for Calorie Needs

• Mifflin-St. Jeor Equation

Women \[ \text{RMR} = (10 \times \text{wt}) + (6.25 \times \text{ht}) - (5 \times \text{age}) - 161 \]

Men \[ \text{RMR} = (10 \times \text{wt}) + (6.25 \times \text{ht}) - (5 \times \text{age}) + 5 \]

\text{wt} = \text{body weight (kg)}

\text{ht} = \text{height (cm)}
Estimated Energy Expenditure (EEE)

- EEE = RMR x Activity Factor

**Activity Factors**

Sedentary = 1.3  
Slightly Active = 1.4  
Moderately Active = 1.5  
Very Active = 1.6  
Extra Active = 1.8

For overweight or obese persons, caloric intake should be calculated by reducing the patient’s daily calories by 500-1,000 to promote one to two pounds weight loss per week.
Weight Loss Goals

• Weight loss of only 3-5% that is maintained has the ability to produce clinically relevant health improvements (reductions in triglycerides, blood glucose, and risk of developing type 2 diabetes)

• Larger weight loss reduces additional risk factors of CVD

• Reduce body weight at a rate of up to two pounds per week

• Weight loss of 5-10% within 6 months is recommended
S.M.A.R.T. Goals

- Specific
- Measurable
- Attainable
- Realistic
- Timely

“Walk 20 minutes a day 5 days a week for a month”
Portion Control

• Using packages containing a defined amount of energy (complete meals, individual food items)

• Portion-controlled utensils where food is delivered in specific serving sizes

• Eating one or more single-serving portion sized meals per day

• MyPlate.gov which assists with consuming appropriate serving sizes of specific foods
www.ChooseMyPlate.gov
Energy Focused

• Very Low Calorie Diet (VLCD)
  – Provides ≤800 kcal/day
  – Only appropriate for those with a BMI ≥30
  – VLCDs are protein-sparing modified fasts that require medical supervision
  – Designed to preserve lean body mass: usually 70-100 g/day of protein
  – High degree of dietary structure commonly consumed as liquid shakes
  – Used with individuals before having bariatric surgery to reduce overall surgical risks in those with severe obesity
Energy Focused

- Low Calorie Diet (LCD)
  - >800 kcal/day and typically ranges from 1,200-1,600 kcal/day
  - Can be structured with use of a meal plan which all food choices and portion sizes for all meals and snacks are provided
  - Meal plans can include a partial meal-replacement plan (liquid shakes) for 2 meals with a reduced energy meal and snack composed of conventional foods
Macronutrient Focused

• Low Carbohydrate
  – Defined as consuming no more than 20-50 g of carbohydrate per day during 2 month induction phase, with gradual increase to \( \leq 120 \) grams per day
  – Energy and other macronutrients are not restricted
"I don’t think this is what your doctor meant by lowering your carbs, honey."

© 2005 Diabetes Health
Macronutrient Focused

- Low Fat
  - Women~1,500 kcal/day and men~1,800 kcal/day
  - 30% of kcal from fat
  - ≤10% of kcal from saturated fat
  - Limit sweets and high fat snacks
  - Lean meats, low fat dairy, low-fat grains, vegetables and legumes
Macronutrient Focused

• Very Low Fat
  – 10-20% kcal/day fat
  – Primarily plant based with limited amounts of low fat dairy, eggs, lean meats, and fish
  – Discourage refined carbohydrates
  – Examples: Pritikin and Ornish
Effect of Low-Fat and Low-Carbohydrate Meal Plans on Weight Over 2 Years

Adults with Obesity
(N=307)

Lipid Effects of Low-Fat and Low-Carbohydrate Meal Plans

**Adults with Obesity**
(N=307)

- **Low-fat meal plan**
- **Low-carbohydrate meal plan**

* $P<0.001$ between groups. † $P<0.01$ between groups.

Dietary Pattern Focused

• Moderate Fat
  – Mediterranean diet with energy restriction
  – Women ~1,500 kcal/day and men~1,800 kcal/day with ≤35% of kcal/day from fat
  – Plant based foods such as fruits, vegetables, grains nuts, seeds
  – Minimally processed foods
  – Olive oil as primary source of fat
  – Dairy products, fish, and poultry consumed in low to moderate amounts
  – Minimal amount of red meat
Dietary Pattern Focused

- DASH (Dietary Approaches to Stop Hypertension) with energy restriction
  - Reduce sodium intake to 2300 mg or 1500 mg daily
  - Increase whole grains
  - Decrease intake of saturated fat
  - Increase consumption of fruits and vegetables (8-10 servings/day)
  - Incorporate low fat dairy (2-3 servings/day)
  - Avoid excessive alcohol intake (no more than two servings/day for men and no more than one serving/day for women)
  - Increase physical activity
Effects of Different Diets on Weight

**Dietary Intervention Randomized Control Trial (DIRECT)**

**Study Design**

- 322 overweight or obese adults (85% men)
- 2-year study duration
- Randomized, controlled design

<table>
<thead>
<tr>
<th>Diet group</th>
<th>Calorie Limit</th>
<th>Fat Limit</th>
<th>Characteristic nutrition sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low fat</td>
<td>1500 for women 1800 for men</td>
<td>30%</td>
<td>Grains, vegetables, fruits, beans</td>
</tr>
<tr>
<td>Mediterranean</td>
<td>1500 for women 1800 for men</td>
<td>35%</td>
<td>Olive oil, nuts, vegetables, fish</td>
</tr>
</tbody>
</table>
| Low carbohydrate   | None          | None      | 20 g/day of carbohydrate for 2 months, then 120 g/day of carbohydrates
                                                              |               | Fat, protein, and vegetables                               |

Effect of Low-Fat, Low-Carbohydrate, and Mediterranean Diets on Weight

Dietary Intervention Randomized Control Trial (DIRECT) (N=322 Adults with Obesity)

Weight Change Over 2 Years

- Low-fat diet
- Mediterranean diet
- Low-carbohydrate diet

Adherence Over 2 Years

- Low fat: 90%
- Mediterranean diet: 85%
- Low-carbohydrate diet: 78%

Effects of Different Diets on Weight Over Time

Dietary Intervention Randomized Control Trial (DIRECT)

- All participants, 2 years (n=322)
  - Mean Weight Loss (kg): -2.9
- Completers, 2 years (n=272)
  - Mean Weight Loss (kg): -4.4
- Completers, 6 years (n=259)
  - Mean Weight Loss (kg): -4.7

6-Year Diet Adherence

- Stayed on original diet: 67%
- Switched diet: 11%
- Stopped diet: 22%
Effects of Different Diets on Glucose and Lipids Over Time

Dietary Intervention Randomized Control Trial (DIRECT)

Effect on Lipids at 2 and 6 Years

Dietary Timing Focused

- Lacking investigation for weight loss using RCTs
  - Eating frequency
  - Timing of eating
  - Breakfast consumption
Helpful Food Journal Tracking Apps

- Lose It!
- MyFitnessPal
- Fat Secret
- Spark People
- Calorific
- My Food Diary
- See How You Eat
- My Net Diary
- MyPlate
- Go Meals
Physical Activity

• Goal of ≥ 150 min/week of moderate aerobic exercise 3 to 5 times per week
• Resistance training 2 to 3 times per week consisting of single-set exercises that use the major muscle groups
• An increase in active leisure activity should be encouraged to reduce sedentary behavior
• Physical activity should be individualized
  ✓ Include activities and exercise regimens within the capabilities and preferences of the patient
  ✓ Take into account health-related and physical limitations
Behavioral Therapy/Counseling

• Assess readiness for change
• Break unhealthy behavior chains
• Goal setting
• Identify emotional triggers
• Identify and utilize sources of support
• Self-monitoring (food records)
Weight Maintenance

• Continued weight loss after 6 months can be a challenge
• Successful weight maintenance is defined as a regain of weight that is less than 6.6 pounds in 2 years
• Weight regain more likely within the first two years following the initial loss
Biggest Loser Study

- 14 Biggest Loser competitors
- RMR determined by indirect calorimetry
- Weight loss at end of 30-week competition was 58.3±24.9 kg and RMR decreased by 610±483 kcal/day
- After 6 years, 41.0±31.3 kg of the lost weight was regained, while RMR was 704±427 kcal/day below baseline
- Metabolic adaptation or metabolic thermogenesis

Fothergill et al., (2016). Persistent Metabolic Adaptation 6 Years After the Biggest Loser Competition. *Obesity*, 24(8), 1612-1619.
National Weight Control Registry (NWCR)

- Registry includes more than 10,000 people from across the 50 states with an average weight loss of 66 lb. per person
- Person must have lost 30 lb. and maintained weight loss for a year or longer
- On average, people on the current list have kept off their weight for more than five years
National Weight Control Registry (NWCR)

- 45% lost weight following various diets on their own
- 55% used a structured weight-loss program
- 98% modified their diet in some way—most cutting back on how much they ate in a given day
- 94% increased their physical activity—walking most popular form of exercise
National Weight Control Registry (NWCR)

- Keys to maintaining weight
  - Vast majority eat breakfast every day
  - Weigh themselves at least once a week
  - Watch fewer than 10 hours of television per week
  - Exercise about an average of an hour a day
Conclusion

- There is evidence to support that most diets are effective for obesity management
- Individualize diet according to personal preference and eating patterns
References


Fothergill et al., (2016). Persistent Metabolic Adaptation 6 Years After the Biggest Loser Competition. *Obesity, 24*(8), 1612-1619.


christine-olson@ouhsc.edu

405-271-7000 ext. 31088