Individualizing Lifestyle Therapy for Patients With Obesity – Eating Patterns, Physical Activity, and Behavior Efficacy

Daniel L. Hurley, MD FACE
Mayo Clinic, Rochester MN

Disclosures

• Industry support
  • None

• Off label drug use
  • None
Objectives

• Why focus on obesity?
  • Weight loss is an issue that endocrinologists must address
  • Evidence suggests lifestyle interventions for healthy eating and regular activity can benefit patients with obesity

Lifestyle Therapy for Obesity
AACE Obesity Clinical Practice Guidelines

• An evidence-based lifestyle treatment plan includes three components
  • Dietary meal plan (R64-66)
  • Physical activity (R64, R68-71)
  • Behavior modification (R64, R72-75)
Lifestyle Therapy for Obesity

#1. Dietary meal plan (R64-66)

- **Features**
  - A healthy reduced-calorie meal plan
  - 500 to 750 calorie daily deficit
  - Individualized to personal and cultural differences
  - Meal plan types
    - Mediterranean, DASH, low-carbohydrate, low-fat, high protein, vegetarian
  - VLCD option requires close medical supervision
  - Meal replacements

VLCL, very low calorie diet. DASH, dietary approach to stop hypertension.

AACE CPG
Diets and Macronutrient Composition

- Reducing total energy (caloric) intake should be the main component of any weight loss intervention
  - However, there is insufficient clinical data to support one dietary pattern over another for weight loss
  - Selection of a specific meal pattern type may be helpful in select patient groups
    - Higher-protein: can enhance satiety
    - Low-fat: ↓es energy dense foods & overeating
    - Low-carb: complex carb + fiber can ↓ calories

### Macronutrient Pattern and Effect on Weight Loss

<table>
<thead>
<tr>
<th>Eating Pattern or Macronutrient Change</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low glycemic index load</td>
<td>↑ Endothelial function, ↓ glycemic variability, effects on energy metabolism, decreased adipocyte diameter, no incremental effect on weight loss¹</td>
</tr>
<tr>
<td>Low carbohydrate</td>
<td>Improved lipids and glycemic status, improved cardio-metabolic risk factors, improved renal function, no incremental effect on weight loss (some studies show more short-term weight loss²)</td>
</tr>
<tr>
<td>High protein</td>
<td>Longer benefit on waist circumference and % fat, decreased adipocyte diameter, improved cardio-metabolic risk factors, animal (not plant) proteins associated with markers of inflammation, less relative loss of muscle mass, no incremental effect on weight loss</td>
</tr>
<tr>
<td>Moderate carbohydrate – moderate protein</td>
<td>Improved body composition, improved lipids, improved postprandial insulin response</td>
</tr>
<tr>
<td>Low fat</td>
<td>Beneficial effects on lipids, benefits on lipids replacing with unsaturated fats, improved renal function, no incremental effect on weight loss</td>
</tr>
<tr>
<td>High fat</td>
<td>With lactation: when hypocaloric, better weight loss compared with hypocaloric low-carbohydrate diet</td>
</tr>
</tbody>
</table>

¹Incremental effect in comparison to an isocaloric control diet does not occur or is inconsistent.
²Short term is <1-year.
DIRECT Trial: Low-fat, Low-carb, and Mediterranean Diets and Lipids


DIRECT Trial: Low-fat, Low-carb, and Mediterranean Diets and Weight Loss

Macronutrient Pattern and Effect on Weight Loss

<table>
<thead>
<tr>
<th>Specific Meal or Eating Pattern</th>
<th>Effect</th>
</tr>
</thead>
</table>
| Mediterranean diet¹ | • Decreased risk of certain cancers  
• Reduces cardio-metabolic risk factors  
• Reduces risk of the metabolic syndrome  
• Reduces markers of inflammation  
• Improves hepatic steatosis  
• Improves insulin sensitivity  
• Improves renal function  
• No incremental effect on weight loss² |
| DASH diet³ | • Decreased systolic BP and diastolic BP (especially in those with baseline HTN and African Americans)  
• Effective weight loss when combined with (minus 500 calorie/day) reduced energy intake |

¹Use of olive oil as fat source, with monounsaturated fat oleic acid as ~75% of fatty acids (EVOO; extra virgin olive oil, with no effect on weight).  
²Incremental effect in comparison to an iso-caloric control diet does not occur or is inconsistent.  
³Rich in fruits, vegetables, and low-fat dairy foods, low in fat content, with limited salt, red meats, sugar and sugar-containing beverages.

Weight Loss is Related to Diet Adherence

Lifestyle Therapy for Obesity
#2 Physical activity (R64, R67-71)

• Features
  • Aerobic physical activity
    • Progressing to >150 min/wk, on 3-5 days/wk
  • Resistance exercise
    • Single set repetitions of major muscle groups on 2-3 days/wk
  • Reduce sedentary behavior
    • Increase non-exercise and leisure activities
  • Individualize program
    • As per preferences and physical limitations

Physical Activity & Weight Loss Recommendations

• Modest (1 to 3 kg) weight loss with >150 min/wk aerobic activity
  • Additional 1-3% total body weight loss when higher intensity aerobic exercise added to a weight loss diet plan

• Resistance exercise training recommended with aerobic activity in patients with obesity and T2DM
  • 2-3 times/wk for major muscle groups
  • Results in more fat loss, with improved body composition and cardio-metabolic risk factors
  • Greater fat loss and less fat-free mass loss
**Exercise Type and Body Composition**

MRI measured change in fat and muscle mass

136 sedentary men and women with obesity. Randomized to 1 of 4 groups for 6 months.

---

**Physical Activity & Weight Maintenance**

- More intensive activity often required to maintain weight loss
  - Less weight regain than those less active
  - Equivalent to 30-35 min/day vigorous activity (i.e., jogging/running)
  - Greater amounts of activity associated with longer-term weight loss maintenance
    - DPP trial, Look AHEAD trial, HUNT study
  - In patients with T2DM, intense activity lowers weight (3.6%) more than diet alone
    - Can improve A1c even without change in BMI
Physical Activity & Weight Maintenance

• **Exercise strategies**
  - Group vs home exercise – ns difference\(^1\)
  - Structured vs lifestyle exercise – ns difference\(^2\)
  - Short vs long-bouts of exercise\(^3\)
    - Frequent, intense exercise best
    - Improved weight maintenance with resistance exercise

---

Exercise Type and Participation
Effect on weight loss

<table>
<thead>
<tr>
<th>Type of Exercise</th>
<th>Level of Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate intensity/moderate duration</td>
<td>&lt;150 min/wk at 6 and 12 mos (n=31)</td>
</tr>
<tr>
<td>Vigorous intensity/moderate duration</td>
<td>Variable(^*) (n=81)</td>
</tr>
<tr>
<td>Moderate intensity/high duration</td>
<td>≥150 min/wk at 6 and 12 mos (n=33)</td>
</tr>
<tr>
<td>Vigorous intensity/high duration</td>
<td>≥200 min/wk at 6 and 12 mos (n=51)</td>
</tr>
</tbody>
</table>


\(^*\) ≥150 min/week at 6 months but <150 min/week at 12 months.

Weight Loss & Maintenance Strategies

- **How much exercise is needed?**
- **For weight loss**
  - DPP >150 min/wk
  - Look AHEAD >175 min/wk
- **For weight maintenance**
  - 200 to 300 min/wk

Lifestyle Therapy for Obesity

**Behavior modification**

Weight maintenance vs relapse after weight loss in women with obesity

- **Maintenance of average weight (n=30)**
  - Regular exercise 90%
  - Problem solving 95%
  - Social support 70%
  - Personalized diet 70%

- **Relapse to >20% of overweight (n=44)**
  - Limited exercise 67%
  - Escape-avoidance 90%
  - Limited support 62%
  - Emotional eaters 70%

*Jakicic, et al, Obesity 2011*

*Kayman et al. Am J Clin Nutr 1990;52:800*
Lifestyle Therapy for Obesity
#3 Behavior modification (R64, R72-75)

• Features
  • Goal setting
  • Self monitoring
  • Problem solving strategies
    • Stimulus control
    • Stress reduction
  • Psychological counseling as needed
    • Motivational interviewing
    • Mobilization of social support systems
    • Education and monitoring (face-to-face, group sessions, remote technologies)

Lifestyle Therapy for Obesity
Behavior modification – individualized

• Getting your patient focused on health
  • Ask – raise the question
    • What are you doing now for ____?
    • What has worked for you had in the past?
    • What makes it difficult for you to ____?
    • What are some benefits for you in ____?
  • Set realistic expectations
  • Expect relapse, and be supportive
  • Behavioral approaches
    • Trans-theoretical theory
    • Social-cognitive theory
Building Motivation for Behavior Change
Trans-theoretical model

• Five stages of changing behavior
  • Pre-contemplative
  • Contemplative
  • Preparation
  • Action
  • Maintenance

Behavior Modification
Social-cognitive model

• Behavior change is influenced by
  • Environmental factors
    • Avoid cues that promote negative behavior
    • Promote cues that promote positive change
  • Personal factors
    • Goal setting – be realistic, with achievable and incremental goals
    • Self-monitoring - for diet and activity
    • Problem solving
      • What is the problem? When and where does it occur? Who else is involved?
Structured Lifestyle Therapy for Obesity
Critical components and venues for success

• Healthy, reduced calorie meal plan (R64-66)
  • Dietitian visits and structured diets, commercial programs, replacement meals

• Aerobic and resistance exercise (R64, R68-71)
  • Trainer, health coach, sports medicine

• Behavior change interventions (R64, R72-75)
  • Face-to-face office meetings
  • Group sessions
  • Remote technologies (telephone, internet, text messaging)

Commercial Weight Loss Program
Greater Weight Loss Than Self-help

Weight Watchers Trial
(N=423)

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Self-help</th>
<th>Weight loss center-based support</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>26</td>
<td>-5.0</td>
<td>-6.5</td>
</tr>
<tr>
<td>52</td>
<td>-7.0</td>
<td>-8.5</td>
</tr>
<tr>
<td>78</td>
<td>-9.0</td>
<td>-10.0</td>
</tr>
<tr>
<td>104</td>
<td>-11.0</td>
<td>-12.0</td>
</tr>
</tbody>
</table>

No. patients
Self-help 212 172 170 156 159
Commercial 211 175 176 154 150

Commercial Meal Replacement Program
Greater Weight Loss Than Usual Care

Jenny Craig Trial
(N=442)

- Usual care (n=111)
- Telephone-based support (n=164)
- Weight loss center-based support (n=167)

Δ Weight (kg)

0 6 12 18 24
Months

0 -2 -4 -6 -8

Behavior Support Interventions

- Behavior lifestyle intervention and support should be intensified if patients do not achieve a 2.5% weight loss in the 1st month
  - DPP – early weight loss predicted long-term weight loss success
    - Weight loss of >5% needed for beneficial effects on A1c, BP, lipids in patients with T2DM
  - A stepped care approach should teach skills for problem solving, and evaluate outcomes
    - The intervention and support should be tailored to ethnic, cultural and educational background

Weight Loss Maintenance
Adjusted weight change by treatment group

Phase 1
Phase 2

Weight change (kg)

Month (relative to randomization)

-10 -8 -6 -4 -2 0 2 4 6 8 10

Self-directed (n=341)
Personal contact (n=341)
Interactive technology (n=347)


Lifestyle Therapy for Obesity
NWCR study of successful weight loss

- 77% had a trigger event
  - Men-medical, and women-emotional life event

- 89% used both diet and exercise, and 75% weighed regularly once/wk
  - Diet: 92% limited calorie intake, 44% limited portion size, 44% counted calories, 23% used a food exchange
  - Activity: 92% exercised at home, 72% used aerobic activity (equivalent to ≥1000 kcal/wk)

- 95% had improved QOL – for health, energy level, mobility, mood, and self-confidence

Summary: Lifestyle Therapy for Obesity
AACE Obesity Clinical Practice Guidelines

- An evidence-based lifestyle treatment plan includes three components
  - Dietary meal plan (R64-66)
  - Physical activity (R64, R68-71)
  - Behavior modification (R64, R72-75)
Thank You!

hurley.daniel@mayo.edu