Prevention of Overweight and Obesity: Delivering Effective Advice to Your Patients

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Learning Objectives

• The participants will recognize the need to partner with patients, identify strategies for successful partnering and engage patients in their own weight loss plans.

• The participants will be able to better implement obesity counseling using evidence-based communication methods, such as motivational interviewing and other behavioral techniques.

• The participants will be able to identify dietary approaches and the need for various other team members in the obesity management process, given the needs of the patient – especially when the primary care physician’s time is more limited.
Critical Question 4. Lifestyle Intervention

- Gold standard: trained interventionist; face to face counseling; 14 sessions in 6 months with follow-up for 1 year; comprehensive (diet, physical activity and behavioral therapy); reliably produces 8 kg weight loss at 1 year.

- No difference in individual or group approaches.

- Telephone interventions generally equal to face-to-face.

- Internet or email interventions produce less weight loss.

- Commercial counseling programs (with or without packaged foods) and (in person or telephone counseling) can be effective – Jenny Craig, Nutrisystem, Weight Watchers.


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**Percentage of Participants Meeting Different Weight Loss Criteria at 1 Yr**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>ILI</th>
<th>DSE</th>
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</thead>
<tbody>
<tr>
<td>≥20.1%</td>
<td>92.7%</td>
<td>55.6%</td>
</tr>
<tr>
<td>≥25%</td>
<td>68.0%</td>
<td>13.6%</td>
</tr>
<tr>
<td>≥27%</td>
<td>55.1%</td>
<td>7.0%</td>
</tr>
<tr>
<td>≥10%</td>
<td>37.7%</td>
<td>3.3%</td>
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</tbody>
</table>

How effective is a state-of-the-art lifestyle intervention?


The Look AHEAD Trial: Follow-up over 10 Years

Main Effect (95% CI): -4 (-5, -3), p<0.05
What accounts for the individual variation in weight loss response?

In Look AHEAD, men lost more than women; those ≥55 years lost more than those <55 years.

But the difference was entirely explained by adherence...

Best predictor of weight loss success at 1-Year in Look AHEAD?

Adherence, in multiple dimensions, is the best predictor of weight loss

Reduction in Initial Weight in ILI participants, %

Quartiles:
P < .001 for correlation between greater adherence (each measure) and weight loss
  • Mean weight loss value for each quartile printed at end of bar.
  • Mean weight loss per quartile group shown within bar.

Adherence

• Is a multi-dimensional construct.
• Adherence to one facet of intervention does not correlate to other facets.
• There is no “non-adherent personality.”
• Can be biologic or non-biologic in origin.

• Whatever bells and whistles we develop for lifestyle intervention, a priority is to understand the underpinnings of adherence.
Racial & Ethnic Differences in Weight Loss: Look AHEAD Study 1 year results

Weight Loss by Gender & Ethnicity

Adherence did not modify differences


However, at 4 years, there were no significant differences by race or ethnicity for participants in Look AHEAD ILI.

LOSS: Specific Aims

• Primary Aim
  – To test whether weight loss at 2 years for an intensive medical treatment for Class III obesity produces greater weight loss than usual care

• Secondary Aims
  – To assess group differences in
    • Changes in BP and risk factors for cardiovascular diseases
    • Safety and tolerability
    • QOL and psychosocial measures
    • Economic measures

LOSS Study - 8 clinical sites, corresponding to population centers

Physician PI, office manager and interventionist received 8 hours of instruction in obesity management and 4 hours in research procedures.
Screening, Randomization and Enrollment

- Letters from OGB inviting potential participants to open house at site
- Open house with slide set explaining study
- One screening visit, one randomization visit
- Inclusion Criteria
  - Participant in EPO or PPO programs of OGB
  - BMI 40-60 kg/m²
  - 20-60 years of age
  - Diabetes permitted
  - Ambulatory
  - Few exclusions (weight loss medications, severe mental disorders, cancer, heart failure)

Enrollment and retention
**LOSS Intervention Components**

- **Intensive Intervention (3 phases)**
  - Phase 1 (1-3 months)
    - Low Calorie Liquid Diet (Health One dispensed)
  - Phase 2 (4-8 months)
    - Group Behavioral therapy weekly
    - Structured Diet (meal replacements recommended)
    - Pharmacotherapy (sibutramine, also orlistat, diethylpropion)
  - Phase 3 (8-24+ months)
    - Group behavioral therapy, monthly contact + pharmacotherapy
    - Toolbox Approaches
- **Usual Care**
  - Access to Mayo Clinic Weight Management website

**Additional aspects of LOSS**

- All medical care delivered by the patient’s PCP; LOSS sites delivered weight loss only.
- LOSS PIs used medication management algorithm for diabetic participants.
- Pragmatic approach to treatment.
- Weight loss medications dispensed by the LOSS sites.
- $100 gift card given to encourage attendance at 2 year visit
- All data capture by an electronic web-based data entry system
**LOSS Health Outcomes Comparisons: Completers analysis**

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th></th>
<th>Year 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IMI (119/200)</td>
<td>UC (92/193)</td>
<td>P</td>
<td>IMI (101/200)</td>
</tr>
<tr>
<td>% observed</td>
<td>60%</td>
<td>48%</td>
<td>0.02</td>
<td>51%</td>
</tr>
<tr>
<td>% wt loss +SD</td>
<td>-13.1% ±1.2</td>
<td>-0.9% ±0.6</td>
<td>&lt;0.0001</td>
<td>-9.7% ±1.3</td>
</tr>
<tr>
<td>FPG mean Δ mg/DL</td>
<td>-5.0</td>
<td>+4.6</td>
<td>&lt;0.0001</td>
<td>+2.4</td>
</tr>
<tr>
<td>HDL % change</td>
<td>+6.8%</td>
<td>-0.1%</td>
<td>0.004</td>
<td>+7.9%</td>
</tr>
<tr>
<td>ALT % change</td>
<td>-11.9%</td>
<td>+5.1%</td>
<td>0.003</td>
<td>-4.3%</td>
</tr>
</tbody>
</table>

No significant group differences in BP, HR at year 1 or 2.
No significant group differences in LDL or TG at year 2.

**LOSS Summary**

- The study population broadly represents severely obese patients commonly encountered in US medical practice.
- After brief training, most primary care sites with no prior experience were able to safely and effectively deliver the intervention and collect research data.
- For those who attended the 2 year IMI visit, mean weight loss was 9.7% ± 13.5%, a clinically significant improvement over usual care.
- Odds of meaningful weight loss among participants at 2 years:
  - Of those who attended, 61% lost 5% or more and 41% lost 10% or more.
  - Of all randomized subjects, 31% lost 5% or more and 21% lost 10% or more.
LOSS Conclusions

• These results indicate that trained PCPs can be successful in helping a subset of patients with severe obesity achieve meaningful weight loss.

But how can it be done?

• Given the length of time for the visit with the PCP, what are the most effective strategies?
  – Counseling the patient
  – Recommending meal replacements
  – Technological advances
  – Team approaches or utilizing community resources
5As Approach

The 5As counseling framework – a way to teach and evaluate the quality of obesity counseling

1. Assess risk, current behavior, and readiness to change
2. Advise change of specific behaviors
3. Agree and collaboratively set goals
4. Assist in addressing barriers and securing support
5. Arrange for follow-up

Jay et al. BMC Health Services Research 2010, 10:159

Assessing Readiness to Change

- Strong desire & intent to change for clear, personal reasons
- Minimum of obstacles to change
- Skills & self-confidence to make a change
- Positive feelings about change & the belief that it will result in meaningful benefit
- Perception that planned changes are congruent with self-image & social group norms
- Encouragement & support to change from valued persons
An algorithm for identifying appropriate weight loss options: assess motivation and decide on the best approach for the patient as shown above.

What about technology?

What’s the state-of-the-art in lifestyle intervention?
What are promising innovations in lifestyle intervention?
  • Wearables - functional or just for fun?
  • mHealth, eHealth and commercial approaches - reason for hope or hype?
  • Adherence – the new frontier?
The Future of Obesity Treatment
Accessible, Inexpensive, and Technology Based?

A staggering 68% of US adults are either overweight or obese. Current direct medical costs associated with treating obesity-related illness are roughly 5% to 10% of all US health care spending. Effective solutions to this epidemic are scarce, expensive, or both. The mean cost of bariatric surgery is $27,000. Few medications are available for weight loss, and despite recent promising developments, obesity drugs are unlikely to become a solution to the problem. Many believe significant changes in public policy and the built environment will be necessary to reverse the epidemic. Such changes require a national political will, which is lacking, and in any case would take many years to have a significant effect. So, what on earth should we do right now or in the near future?

A limited number of modestly effective behavioral weight management programs are available but expensive. Our medical community desperately needs new approaches that meet 3 criteria: First, weight management programs should be convenient and accessible to most people in need. Second, these programs must cost significantly less than current alternatives. Technology can play a crucial role in providing low-cost, accessible weight management. Finally, participation should be sustainable, even if programs have only a modest effect on weight. Weight management is often a lifelong struggle, so it is essential that these programs have the ability to retain or encourage people for many years. This is why strategies that take advantage of the long-term relationship of patients with primary care physicians are so important.

Unfortunately, most weight management research has been performed in specialized rather than primary care settings. Few studies performed in primary care have significant shortcomings. We conducted a simple, rather than comprehensive, PubMed search of clinical trials using the keywords obesity and weight loss, which yielded roughly 3200 articles. When that search was narrowed by adding the keyword primary care, only 143 articles remained. We were able to classify most interventions described in these 143 articles into 2 types: simple and

Reasons for Innovation in Lifestyle Intervention

**Accessibility + Affordability = Scalability**
Why incorporate wearables into lifestyle interventions?

- Visual feedback of monitoring data
- Major consumer trend
- Types of wearables:
  - Smart Wristbands
  - Other fitness monitor
  - Smart Watches
  - Chest strap
  - Garments

Examples of Wearables

- Nike FUEL
- JawBone
- Accelerometer
- Fitbit
- Fitbug
- Samsung Gear Fit
- Apple Smart Watch
- Metria IH1
- Smart Garment
Worldwide wearable electronic fitness devices shipments forecast

2013-2016 (Millions of Units)

Source: Gartner (October 2014)

Smart Phone Apps (Diet, PA, Coaching on PDA) + Standard Group Counseling

N=70

Smartphone Apps for Self-Monitoring (Pilot Study N=128; 6 months)

- Interventions include goal-setting and self-monitoring (diet and physical activity)
- Face-to-face at baseline, 6 weeks, and 6 months
- Randomized to app, website, or paper diary for self-monitoring
  - App developed by research team: weekly feedback texts
  - Commercial website (MyMeal Mate)
  - Paper diary


In-Person vs Internet-Delivered Behavioral Weight Loss Programs N 451; 6 mos

- All groups received a 6-month comprehensive weight loss program with weekly meetings
- Groups differed in weekly meeting format
  - In person—face-to-face group meetings
  - Internet—chat group
  - Hybrid—chat group, except 1 session each month was replaced with a face-to-face group meeting

Why keep trying to succeed in weight loss efforts?

• Can we make a difference in the primary care setting?
• What constitutes success?
• What are the benefits?

Therapeutic Weight Loss

<table>
<thead>
<tr>
<th>OBESITY Complication</th>
<th>% weight loss required for therapeutic benefit</th>
<th>Notes</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes Prevention</td>
<td>3% - 10%</td>
<td>Maximum benefit 10%</td>
<td>DPP (Lancet, 2009) SEQUEL (Garvey et al, 2013)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>5% - &gt;15%</td>
<td>BP still decreasing at &gt;15%</td>
<td>Look AHEAD (Wing, 2011)</td>
</tr>
<tr>
<td>Dyslipidemia (TG/HDL)</td>
<td>3% - &gt;15%</td>
<td>TG still decreasing at &gt;15%</td>
<td>Look AHEAD (Wing, 2011)</td>
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<tr>
<td>Diabetes (HbA1c)</td>
<td>3% - &gt;15%</td>
<td>HbA1c still decreasing at &gt;15%</td>
<td>Look AHEAD (Wing, 2011)</td>
</tr>
<tr>
<td>NAFLD</td>
<td>10%</td>
<td>Improves steatosis, inflammation, mild fibrosis</td>
<td>Assy et al, 2007; Dixon et al, 2004; Anish et al, 2009</td>
</tr>
<tr>
<td>Sleep Apnea (AHI)</td>
<td>≥10%</td>
<td>Little benefit at ≤5%</td>
<td>Sleep AHEAD (Foster, 2009) Winslow et al, 2012</td>
</tr>
<tr>
<td>Stress incontinence</td>
<td>7% - 9%</td>
<td></td>
<td>Burgio et al, 2007 Leslee et al, 2009</td>
</tr>
<tr>
<td>GERD</td>
<td>5-10% women 10% men</td>
<td></td>
<td>Singh et al, 2013 Tutujan R, 2011</td>
</tr>
</tbody>
</table>
Strategies for Success in Weight Management

- Provide accountability and motivation
- Promote problem solving skills
  - Orderly method for coping with barriers/problems
    - Barriers due to family or work
    - Social reasons – lack of support
    - Change in motivation level
    - Transportation issues
    - Life situations
    - Environmental issues (rain, snow, hurricanes and tornados)
    - Economic and time issues

- Encourage Self Monitoring
  - Weekly weighing
  - Food and activity monitoring
- Provide reduced calorie and fat diet
  - Structured meal plans and portion controlled diets early on (done in Look AHEAD initially and later on)
- Promote increased physical activity
  - Home based or supervised exercise
- Provide extended treatment
  - Continued contact by telephone and/or mail or email
  - Internet programs using email and internet websites
Strategies for Success in Weight Management

- Continue to use motivational techniques
  - Cultivate social support
  - Utilize motivational interviewing when needed
- Teach maintenance specific skills
  - Relapse prevention training
- Improve adherence as much as possible
  - Be aware of the multiplicity of the potential problems
  - Draft plans to address potential excuses w/options
  - Initially, be sure the participant is appropriate, motivated, and potential barriers discussed
  - Case conference with peers and other professionals for ideas to help the participant

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Strategies for Success in Weight Management

- New technologies are tools.
- Behavioral Interventions testing new technologic tools are emerging.
- Long term studies are needed testing the technologies.
- Adherence is a critical issue for future research.
Why are MDs frustrated?

• Because they have two assumptions that need modifying:
  1. You don’t need to normalize body weight to get benefits.
  2. It is a chronic disease and relapse is expected.
• The reality is that you must keep seeing the patients. It’s just like diabetes . . . . you never discharge the patients. The A1c goes off track and you treat them again. **Same thing with weight loss!!**

Donna H. Ryan, personal communication (5/16/2016)

Bottom line…….

• Behavioral weight loss counseling by PCPs and auxiliary health providers in primary care practices has met with limited success. Why?
  – Infrequent treatment contacts (monthly to quarterly)
  – Brief duration of visits (10-15 minutes)
  – Provider responds to variety of acute illnesses seemingly more pressing than obesity
• Contrast this with intensive group or individual sessions (30- to 90-minute sessions) delivered by weight loss specialists (dietitians, psychologists) which are more costly and likely not to be conducted in primary care.
• Review by Carvajal et al (2013) suggest that there is little evidence that MDs, NPs & PAs can help most obese patients achieve clinically meaningful weight losses (≥5% of initial weight).
Possible considerations

• Teach those in primary care setting to deliver effective weight loss counseling
  – Is there time to provide behavioral counseling?

• Hiring RDs and other lifestyle interventionists might be more economical

• Partner with local counseling resources and/or consider remotely delivered, high intensity weight loss counseling
  – Remotely delivered lifestyle counseling, provided by primary care practice or a call center appears to be convenient for patients (further research needed to determine effectiveness and cost issues)

Carvajal et al., 2013

Resources for providers
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As a health care provider, you are in an ideal position to talk to your patients about weight control. This fact sheet offers tips and resources for addressing this sensitive topic with your patients.

Why talk to patients about their weight?

Two-thirds of American adults are overweight or obese. This excess weight may put them at risk for diabetes, heart disease, and other medical problems. Weight control may help patients delay and reduce these issues.

Studies show that talking with patients about weight control helps to promote behavior change. But many providers fail to do so for these reasons:

- lack of office time with patients
- lack of training on how to talk to patients about weight

Research has shown that patients who were counseled in a primary care setting about the benefits of healthy eating and physical activity often took positive action. They lost weight and exercised more than patients who did not receive counseling.

People who are overweight or obese often want help in setting and reaching weight-loss goals. But it may be tough for some patients to talk about their weight. By speaking with patients caringly and working with them as partners, you can play a key role in helping patients improve their health.

Which patients might benefit the most?

Measuring your patients’ body mass index (BMI) on a regular basis can help you identify those who may benefit the most from information on weight loss. The BMI measures body fat based on a person’s height in relation to weight and provides a score to signal whether someone is at a healthy weight.

Approach the subject of weight loss if your patient has

- a BMI of 30 or above
- a BMI between 25 and 30 plus two or more health problems linked to weight, such as a family history of heart disease or diabetes
- a waist size over 35 inches (women) or 40 inches (men)—even if BMI is less than 25—and two or more health problems linked to weight

See the Resources for Health Care Providers section of this fact sheet for a web link to an online BMI calculator.

How do I bring up the topic?

Patients do not want their health care providers to assume that all their problems are weight related. Address your patients’ main health concerns first. Allow them to talk about other issues that may be affecting their physical or emotional health, such as family or work issues.

Open the discussion about weight in a respectful way. Find out if your patient is willing to talk about the issue. Use terms preferred by patients, such as “weight,” “excess weight,” “unhealthy body weight,” and “BMI,” or ask your patient what terms he or she prefers. You may want to start like this:
Ms. Brown, your BMI is above the healthy range. Excess weight could increase your risk for some health problems. Would you mind if we talked about it?

Be alert to cultural differences that your patients may bring to the table about weight, favorite foods, social norms and practices, and related issues. Patients may be more open when they feel respected. See Resources for Health Care Providers for a link to the Weight-control Information Network (WIN) fact sheet Medical Care for Patients with Obesity, which offers tips for respectful treatment of obese patients in medical settings.

What do patients want to know?

Patients often want information on safe and effective ways to control their weight. A patient who is not yet ready to attempt weight control may still benefit from talking about healthy eating and regular physical activity.

Ask patients about their eating habits. Encourage them to replace foods high in fat, refined grains, and/or sugar with healthier options. Make them aware of the healthy eating resources available from the U.S. Department of Agriculture. For example,

“What kinds of foods do you eat on a typical day?”
“What does ‘healthy eating’ mean to you?”

Find out if your patients are meeting the Government recommendations for physical activity. Make them aware that being inactive, especially sitting for long periods of time at work or at home, may not be good for their health. You may want to ask,

“How much time do you spend sitting down each day?”
“Do you know how much physical activity you should do each week to stay healthy?”

How can I help my patients set goals?

Ask your patients how ready they are to adopt healthier eating and physical activity habits. Work as a partner with each patient to develop a plan. Some questions to ask are these:

“What are your goals regarding your weight?”
“What kind of changes would you be willing to start with?”
“What kind of help would you like from me about your weight?”

Partner with your patients to identify concrete actions they can take to meet their weight goal over the next 6 months.

What is a sensible weight-loss goal?

- Losing weight too quickly may contribute to health problems, such as gallstones.
- A 5-to-7 percent reduction in body weight over 6 months is a sensible weight-loss goal.
- One-half to 2 pounds per week is a safe rate of weight loss.
How can I help my patients stick with their goals?

Praise can help inspire your patients to maintain new behaviors. When you see patients again, note their progress. Offer praise to boost self-esteem and keep them motivated.

Some patients may lose weight very slowly, which can be discouraging. Note any advances in related risk factors, like blood pressure, blood sugar, and high cholesterol. Improving the health numbers related to these factors may motivate patients, especially if changes are made despite slow weight loss.

Discuss any setbacks, and help your patients to overcome challenges. Work with your patients to set new goals. Discuss eating and physical activity habits to change or maintain.

What if a patient needs more help?

In some cases, you may prefer to refer your patient to a weight-loss program or a registered dietitian who focuses on weight control. The Academy of Nutrition and Dietetics offers referrals to registered dietitians throughout the United States. See the Resources for Patients section for contact information.

What type of patients may be best suited for bariatric surgery?

Bariatric surgery may be the next step for patients who remain severely obese after trying approaches other than surgery, especially if they have a disease linked to obesity.

Among adults, bariatric surgery may be an option if the patient has

- A BMI ≥ 40 or
- A BMI ≥ 35, along with a serious health problem linked to obesity, such as type 2 diabetes, heart disease, or severe sleep apnea

Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) conducts and supports a broad range of basic and clinical obesity research. More information about obesity research is available at [http://www.obesityresearch.nih.gov](http://www.obesityresearch.nih.gov).

Clinical trials are research studies involving people. Clinical trials look at safe and effective new ways to prevent, detect, or treat disease. Researchers also use clinical trials to look at other aspects of care, such as improving the quality of life for people with chronic illnesses. To learn more about clinical trials, why they matter, and how to participate, visit the NIH Clinical Research Trials and You website at [http://www.nih.gov/health/clinicaltrials](http://www.nih.gov/health/clinicaltrials). For information about current studies, visit [http://www.ClinicalTrials.gov](http://www.ClinicalTrials.gov).
Resources for Health Care Providers

Additional Reading from the Weight-control Information Network

You can access the brochures and fact sheets listed below online at http://www.win.niddk.nih.gov/publications. You may also request copies by calling WIN toll-free at 1–877–946–4627.

- **Bariatric Surgery for Severe Obesity** explains how this operation on the stomach and/or intestines helps patients with extreme obesity to lose weight. Patients may use this fact sheet to talk about this option with their health care providers. This fact sheet explains which patients might choose this option and describes the different types of bariatric surgery (available online at http://www.win.niddk.nih.gov/publications/gastric.htm).

- **Medical Care for Patients with Obesity** helps health care providers address the concerns of patients with obesity and create offices that welcome all patients (available online at http://www.win.niddk.nih.gov/publications/medical.htm).

Other Resources on Weight Control

- **3 Steps to Initiate Discussion About Weight Management With Your Patients**, from the National Heart, Lung, and Blood Institute (NHLBI), offers tips to health care providers about initiating respectful dialogue with patients about weight management. Available at http://www.nhlbi.nih.gov/health/prof/heart/obesity/aim_kit/steps.pdf.

- **Aim for a Healthy Weight Provider Kit** is a patient education kit from the NHLBI that helps health care providers develop effective programs for weight management in their offices or clinics. The kit is available at http://www.nhlbi.nih.gov/health/prof/heart/educational/lose_wt/.

- **BMI Calculator** is a free tool from the NHLBI for the iPhone, Palm OS, and PocketPC. This tool is available at http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/bmitools.htm.


Inclusion of resources is for information only and does not imply endorsement by NIDDK or WIN.

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Photo on page 2 courtesy of Alex E. Proimos. http://www.flickr.com/photos/proimos/
Healthy Eating and Physical Activity
Tips to Share with Your Patients

Share these ideas with your patients to support their efforts to lose weight or keep a healthy weight. Resources for patients are listed on the back of this sheet.

Set goals for weight control

Encourage your patients to

- Identify specific goals for losing excess weight or maintaining a healthy weight.
- List concrete actions they will take to increase healthy eating and physical activity.
- Set sensible weight loss goals, such as losing 5 to 7 percent of their body weight over 6 months.

Create a healthy eating plan

Encourage your patients to

- Check out the Government’s tip sheets on healthy eating at the MyPlate website (see the back of this sheet).
- Eat more of these foods: beans, fat-free or low-fat cheese and milk, fruits and vegetables, lean meats and seafood, nuts, whole grains (brown rice and oatmeal).
- Limit these foods: breads and pasta made with refined grains, foods with butter or other fats that are solid at room temperature, and sugar-sweetened drinks and desserts.

Be more active

Encourage your patients to

- Check out the Government’s physical activity guidelines (see the back of this sheet).
- Do 150 minutes a week of moderately intense aerobic activity (about 30 minutes on most days). Tell them that aerobic activity uses their large muscle groups (back, chest, and legs) to increase their heart rate and breathing.
- Choose aerobic activities that are fun, like brisk walking, dancing, playing a sport, or swimming.
- Build strength with weight lifting or other weight-bearing exercises at least 2 days per week. If they don’t have weights, they can use books or cans of food to do arm curls.
- Get up and get moving. Sitting for long periods of time may lead to weight gain. They can go for a walk or take the stairs, making sure the stairs are well lit.
Resources for Patients

Reading from the Weight-control Information Network (WIN)

You can access brochures and fact sheets listed below online at http://www.win.niddk.nih.gov/publications. You may also request copies by calling WIN toll-free at 1–877–946–4627.

- **Active at Any Size** explains the benefits of regular physical activity. This brochure also describes activities that people who are overweight or obese can enjoy safely.

- **Changing Your Habits: Steps to Better Health** explains how people can take small steps to become more physically active and consume healthier foods and beverages.

- **Getting on Track: Physical Activity and Healthy Eating for Men** is a brochure that offers tips to help men be physically active and consume healthy foods and beverages.

- **The World Around You** provides tips on how to use the world around you, no matter who you are or where you live, to stay healthy and fit.

Other Resources

- **2008 Physical Activity Guidelines for Americans**
  U.S. Department of Health and Human Services (HHS)
  http://www.health.gov/paguidelines

- **Academy of Nutrition and Dietetics**
  http://www.eatright.org

- **Aim for a Healthy Weight**
  National Heart, Lung, and Blood Institute

- **Dietary Guidelines for Americans, 2010**
  HHS and the U.S. Department of Agriculture (USDA)
  http://www.health.gov/dietaryguidelines

- **Food and Nutrition Information Center**
  USDA
  http://www.nal.usda.gov/fnic

- **MyPlate**
  HHS and USDA
  http://www.choosemyplate.gov

- **National Diabetes Education Program**
  http://yourdiabetesinfo.org

- **U.S. Government Website on Nutrition**
  USDA
  http://www.nutrition.gov

Inclusion of resources is for information only and does not imply endorsement by NIDDK or WIN.
Managing obesity in primary care practice: a narrative review

Raymond Carvajal, Thomas A. Wadden, Adam G. Tsai, Katherine Peck, and Caroline H. Moran

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This narrative review examines randomized controlled trials of the management of obesity in primary care practice, in light of the Centers for Medicare and Medicaid Services’ decision to support intensive behavioral weight loss counseling provided by physicians and related health professionals. Mean weight losses of 0.1–2.3 kg were observed with brief (10- to 15-min) behavioral counseling delivered by primary care providers (PCPs) at monthly to quarterly visits. Losses increased to 1.7–7.5 kg when brief PCP counseling was combined with weight loss medication. Collaborative treatment, in which medical assistants delivered brief monthly behavioral counseling in conjunction with PCPs, produced losses of 1.6–4.6 kg in periods up to two years. Remotely delivered, intensive (> monthly contact) behavioral counseling, as offered by telephone, yielded losses of 0.4–5.1 kg over the same period. Further study is needed of the frequency and duration of visits required to produce clinically meaningful weight loss (>5%) in primary care patients. In addition, trials are needed that examine the cost-effectiveness of PCP-delivered counseling, compared with that potentially provided by registered dietitians or well-studied commercial programs.

Keywords: obesity; weight loss; primary care

Introduction

The U.S. Preventive Services Task Force (USPSTF) has recommended that clinicians screen all adults for obesity and offer intensive multicomponent behavioral interventions to affected individuals, either by providing such treatment themselves or referring patients to appropriate interventions. U.S. adults certainly warrant such attention, given that 34% are obese, defined by a body mass index (BMI) of 30 kg/m² or more, and another 32% are overweight (i.e., BMI of 25.0–29.9 kg/m²). In accordance with the task force’s recommendations, the Centers for Medicare and Medicaid Services (CMS) recently approved the provision of intensive behavioral counseling to obese seniors in primary care practice when delivered by physicians, nurse practitioners (NPs), or physician assistants (PAs) from the practice. CMS recommended that these practitioners provide brief (15 min) weekly counseling sessions for the first month, followed by every-other-week visits for an additional five months. Patients who lose ≥3 kg in the first six months (in these 14 sessions) are eligible for six additional monthly visits.

CMS’s decision to provide behavioral counseling for obesity is laudable, given the demonstrated benefits of this approach in reducing weight and cardiovascular disease (CVD) risk factors, particularly type 2 diabetes. The stipulation, however, that behavioral intervention be provided by physicians, NPs, and PAs (from the practices) is surprising. We are not aware of any randomized controlled trials (RCTs) that have assessed the efficacy of brief counseling visits, as delivered by these providers, on the schedule mandated by CMS. In short, CMS’s
treatment model is not supported by an adequate evidence base.

The present narrative review updates an earlier examination of the treatment of obesity by primary care practitioners (PCPs) who delivered lifestyle counseling to overweight/obese patients in their practices. In addition, the review examines different potential models for managing obesity in primary care, including the options of incorporating auxiliary health professionals on the treatment team or referring patients to providers or programs outside of the practice, as suggested by the Task Force.

Behavioral interventions for obesity

Behavioral treatment for obesity—consisting of a combination of diet, physical activity, and behavior therapy—is considered the cornerstone of weight management for overweight/obese adults. This approach uses behavioral strategies, such as goal setting and record keeping, to help individuals reduce their calorie intake by approximately 500–1,000 kcal/day, principally by reducing their portion sizes, snacking, and consumption of high-fat, high-sugar foods. Caloric restriction is combined with recommendations to exercise (e.g., brisk walking) for at least 30 min/day most days of the week (i.e., 180 min/week). In academic medical centers, behavioral treatment typically is delivered in weekly group or individual sessions that are led by registered dietitians, psychologists, exercise specialists, and other counseling professionals. Weekly group lifestyle intervention of 16–26 weeks induces a mean weight loss of approximately 7–10% of initial weight during this time.

A recent systematic review by the task force revealed the importance of providing high-intensity behavioral interventions (defined in a prior Task Force report as “more than once a month, face-to-face contact during the first three months”). Interventions that provided 12–26 treatment sessions in the first year generally induced weight losses of 4–7 kg, whereas those that offered fewer than 12 sessions yielded losses of only 1.5–4 kg. This latter finding extends the USPTF’s earlier conclusion that there was sufficient evidence to recommend the prescription of high-intensity counseling, but not moderate-intensity (defined as monthly contact) or low-intensity (i.e., < monthly) behavioral counseling.

The task force’s conclusions were based on its review of what it described as “primary care-relevant treatments for obesity.” However, the largest weight losses reported in the review were observed in RCTs conducted in academic medical centers, which employed experienced lifestyle interventionists (i.e., registered dietitians, psychologists, and exercise specialists) who provided weekly group or individual treatment for the first three months or more. Group treatment sessions generally lasted 60–90 min (with individual sessions of 30 min), and some trials included supervised exercise training. A pressing question is whether these interventions, which may be “relevant” to primary care, could actually be implemented in busy primary care practices using the practice’s available physicians and NPs. These professionals typically have little formal training in behavioral weight management. Moreover, 15-min counseling sessions, as proposed by CMS, provide minimal time to review patients’ eating and activity records and to identify solutions to problems identified.

Models for providing behavioral weight management in primary care

Tsai and Wadden have proposed several treatment models for engaging PCPs in the management of obesity and for providing behavioral weight management to appropriate patients (see Fig. 1). PCPs play a critical role in screening adults for obesity and in providing appropriate medical management for weight-related CVD risk factors (e.g., hypertension, type 2 diabetes) and other conditions (osteoarthritis). PCPs also are well prepared to educate patients about the contribution of excess weight to health complications, as well as to inform them of the significant health benefits of a 5–10% reduction in initial weight. Health professionals also can assess obese patients’ motivation for weight reduction and, with interested patients, develop a weight loss plan. With patients who do not wish to lose weight, PCPs can use motivational interviewing to clarify barriers to treatment and then discuss the need to prevent further weight gain.

PCPs have multiple options for offering behavioral weight loss counseling. They may themselves provide lifestyle counseling to patients during routine office visits. As shown on the left hand side of Figure 1, lifestyle counseling may be provided alone or in combination with weight loss medication,
Figure 1. An algorithm for identifying an appropriate weight loss option. After treating cardiovascular disease (CVD) risk factors and assessing patients’ activation for weight loss, primary care providers (PCPs) may elect to offer behavioral counseling themselves (with or without pharmacotherapy) or to provide collaborative care with other health professionals. Alternatively, PCPs may refer patients to community programs (e.g., Weight Watchers) or to obesity treatment specialists (e.g., medically supervised programs, bariatric surgery).

given the increased loss that results from combining these two approaches. PCPs who cannot provide behavioral counseling themselves, because of limited time or competing practice demands, could have auxiliary health professionals in their practice offer such counseling. Nurses, medical assistants, and other personnel could be trained as “lifestyle coaches,” or the practice could hire a registered dietitian or behavioral psychologist to provide counseling. Tsai and Wadden have referred to this as “collaborative obesity care.” In all cases, patients would receive behavioral weight management within the primary care practice, which has the potential advantage of capturing individuals at the point of treatment and fully integrating weight management with patients’ other health care.

The provision of behavioral counseling using either of these models may be impractical in many primary care practices because of the increased volume of patient visits (resulting from high-frequency counseling), lack of physical space, or costs of hiring additional staff. Some PCPs may be able to refer patients to programs or professionals who provide counseling as part of an integrated health system. This may include the use of call centers that provide counseling remotely. Other options include face-to-face self-help or commercial programs in the community that have been empirically validated (e.g., Weight Watchers). Alternatively, PCPs could refer patients to obesity-treatment specialists in the community (e.g., registered dietitians, physicians, bariatric surgeons). With all of these options, patients will benefit from the PCP playing an active role in monitoring changes in their weight and health, congratulating them on their successes, and reminding them of the need for long-term behavior change.
Evidence supporting the different models of behavioral intervention in primary care

The next sections of this review examine studies relevant to the different models of behavioral intervention described earlier. For studies of PCP counseling and collaborative obesity treatment, we identified trials that were conducted in primary care practice and incorporated health care providers from the practice. Several studies were included that attempted to simulate primary care practice by using PCPs inexperienced in weight management as lifestyle interventionists in randomized trials. Thus, this review differs from the recent Task Force analysis which examined primary care relevant studies, many of which included highly trained lifestyle interventionists and were not conducted in primary care settings. We thought that limiting studies in this manner would provide the most appropriate estimates of the results that could be expected from the CMS proposal to have primary care providers deliver intensive behavioral counseling to obese patients in their home practices. (The results of high-intensity behavioral interventions, as delivered in RCTs in academic medical centers, have been reported in numerous other reviews.4,11,12)

Brief behavioral weight loss counseling provided by PCPs

Four randomized trials22–26 assessed the effects of physician-delivered weight loss counseling in primary care practice. Martin et al.22 randomly assigned low-income African-American women, with a mean age of 41.7 years and BMI of 38.8 kg/m², to either usual care, consisting of as-needed medical treatment, or a six-month weight loss intervention, consisting of brief monthly PCP counseling sessions. Counseling visits lasted approximately 15 min and included personalized recommendations for changing diet and physical activity. At six months, patients who received PCP counseling lost a mean of 1.4 kg, compared with a gain of 0.3 kg for usual care (P = 0.01). However, there were no significant differences between groups at the 18-month follow-up,23 as shown in Table 1.

Christian et al.24 examined PCP counseling in patients with type 2 diabetes, with a mean age of 53.2 years and BMI of 35.1 kg/m². Patients were randomly assigned to either a control group, consisting of quarterly PCP visits and printed health education materials, or a lifestyle intervention that included brief PCP-delivered motivational interviewing during quarterly visits. Patients in the intervention group completed computer-based assessments of their motivation for lifestyle change, which PCPs used to guide their counseling recommendations. At 12 months, the intervention group lost 0.1 kg, compared with a gain of 0.6 kg in controls (P = 0.23).

Ockene et al.25 evaluated the effects of brief PCP counseling in patients with hyperlipidemia, with a mean age of 49.3 years and BMI of 28.7 kg/m². Forty-five PCPs were randomly assigned to provide one of three interventions: usual care, physician-delivered nutrition counseling, or physician-delivered nutrition counseling, plus an office-support program. The nutrition intervention was based on a brief patient-centered counseling model, with sessions of 8–10 minutes. The office support program assisted PCPs in implementing the counseling protocol by providing in-office prompts and counseling algorithms. Patients in the three groups were seen an average of 3.4 times over one year. Those who received the combination of physician-delivered counseling and office support lost significantly more weight (2.3 kg) at one year than those in usual care (0.0 kg; P < 0.001). There were no significant differences between the group that received physician-delivered counseling alone (−1.0 kg) and the two other treatment arms.

In a similar study, Cohen et al.26 assessed the effectiveness of PCP counseling in patients with hypertension, with a mean age of 59.5 years and BMI of 34.1 kg/m². Eighteen resident physicians were randomly assigned to usual care or to nutrition counseling training. Those in the latter group were instructed in standard weight loss methods (e.g., calorie control, healthy food alternatives), and their patients were offered monthly counseling visits. Patients in the two groups had an average of 5.2 and 9.7 visits, respectively, over one year. At month six, patients of physicians who received nutrition counseling training lost 1.8 kg, compared with a gain of 0.6 kg for usual care (P = 0.04). However, as shown in Table 1, there were no significant differences between groups at one year.

Summary

Collectively, these four studies22–26 suggest that low- to moderate-intensity, brief lifestyle counseling, provided by PCPs, is unlikely to
Table 1. Studies of brief primary care provider (PCP) counseling, provided alone or with meal replacements or pharmacotherapy

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Interventions</th>
<th>Number of postrandomization visits</th>
<th>Weight change at follow-up, kg</th>
<th>Weight change at follow-up, % of initial weight at follow-up, %</th>
<th>≥5% loss of initial weight at follow-up, %</th>
<th>Attrition at follow-up, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief PCP counseling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christian et al.</td>
<td>310</td>
<td>1. Quarterly PCP visits</td>
<td>4</td>
<td>+0.6 ± 0.4^a</td>
<td>11^a</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Quarterly PCP visits + PCP counseling</td>
<td>4</td>
<td>-0.1 ± 0.4^a</td>
<td>21^b</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Cohen et al.</td>
<td>30</td>
<td>1. Usual care</td>
<td>5.2</td>
<td>+0.6 ± 0.6^a</td>
<td>+1.3 ± 0.8^a</td>
<td>-</td>
<td>Not stated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Usual care + PCP counseling</td>
<td>9.7</td>
<td>-1.8 ± 0.9^b</td>
<td>-0.9 ± 1.0^a</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Martin et al.</td>
<td>144</td>
<td>1. Usual care</td>
<td>0</td>
<td>+0.3 ± 0.4^a</td>
<td>+0.1 ± 0.5^a</td>
<td>12^a</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Usual care + PCP counseling</td>
<td>6</td>
<td>-1.4 ± 0.5^b</td>
<td>-0.5 ± 0.4^a</td>
<td>7^a</td>
<td>44</td>
</tr>
<tr>
<td>Ockene et al.</td>
<td>1,162</td>
<td>1. Usual care</td>
<td>3.4</td>
<td>-</td>
<td>0.0^a</td>
<td>-</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. PCP training</td>
<td>3.1</td>
<td>-</td>
<td>-1.0^b</td>
<td>-</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. PCP training + office support</td>
<td>3.6</td>
<td>-</td>
<td>-2.3^b</td>
<td>-</td>
<td>37</td>
</tr>
<tr>
<td>Brief PCP counseling + meal replacements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ashley et al.</td>
<td>113</td>
<td>1. RD counseling</td>
<td>26</td>
<td>-3.4 ± 1.1^a</td>
<td>-</td>
<td>-</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. RD counseling + meal replacements</td>
<td>26</td>
<td>-7.7 ± 1.5^b</td>
<td>-</td>
<td>-</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. PCP/RN counseling + meal replacements</td>
<td>26</td>
<td>-3.5 ± 1.1^a</td>
<td>-</td>
<td>-</td>
<td>34</td>
</tr>
<tr>
<td>Brief PCP counseling + pharmacotherapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Hauptman et al.</td>
<td>635</td>
<td>1. PCP guidance + placebo</td>
<td>10</td>
<td>-4.7 ± 0.6^a</td>
<td>-1.7 ± 0.6^a</td>
<td>24.1^a</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. PCP guidance + orlistat, 60 mg TID</td>
<td>10</td>
<td>-6.9 ± 0.6^b</td>
<td>-4.5 ± 0.6^b</td>
<td>33.8^b</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. PCP guidance + orlistat, 120 mg TID</td>
<td>10</td>
<td>-8.0 ± 0.6^b</td>
<td>-5.0 ± 0.7^b</td>
<td>34.3^b</td>
<td>44</td>
</tr>
<tr>
<td>Poston et al.</td>
<td>250</td>
<td>1. RD/RN counseling</td>
<td>13</td>
<td>+0.6 ± 0.3^a</td>
<td>+1.7 ± 0.5^a</td>
<td>9.4</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Orlistat, 120 mg TID</td>
<td>13</td>
<td>-2.3 ± 0.6^b</td>
<td>-1.7 ± 0.8^b</td>
<td>24.1</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. RD/RN counseling + orlistat, 120 mg TID</td>
<td>13</td>
<td>-2.9 ± 0.5^b</td>
<td>-1.7 ± 0.7^b</td>
<td>26.8</td>
<td>34</td>
</tr>
<tr>
<td>Wadden et al.</td>
<td>106</td>
<td>1. Sibutramine, 10–15 mg daily</td>
<td>8</td>
<td>-5.0 ± 1.0^a</td>
<td>-</td>
<td>42</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Sibutramine, 10–15 mg daily + PCP counseling</td>
<td>8</td>
<td>-7.5 ± 1.1^a</td>
<td>-</td>
<td>56</td>
<td>19</td>
</tr>
</tbody>
</table>

Note: Values shown for weight change are mean ± SEM. For each study, under “weight change” (at month 6 and at follow-up) and “≥5% loss of initial weight at follow-up,” values labeled with different letters (a, b) are significantly different from each other at $P < 0.05$.

^a Attrition is defined as the percentage of participants who did not contribute an in-person weight at the end of the study. An intention-to-treat analysis was used in most studies, except for three that used a completers’ analysis.25–27

^∗ This study did not report the standard deviations or standard errors of weight loss.

^† This study included two additional groups, both of which included intensive group lifestyle modification. The results of these groups are not displayed here.

RD, registered dietitian; RN, registered nurse; TID, three times per day.
produce clinically significant weight loss (≥5% of initial weight) in overweight/obese patients (although losses of 2–4.9% may have some clinical benefit). Weight losses in the intervention arms ranged from only 0.1 to 2.3 kg, losses that generally are not associated with significant health improvements. (In most cases, a loss of 5 kg corresponds to a loss of 5% of initial weight.) The low frequency of treatment contact is likely responsible for these modest outcomes, although the brief duration of treatment visits (i.e., 10–15 min) also may be a factor. Increasing the frequency of PCP visits to at least twice monthly could be expected to increase weight loss, as suggested by the Task Force’s review. This possibility is suggested by results of a study by Ashley et al., in which PCPs delivered brief behavioral counseling to community volunteers recruited from advertisements (i.e., not primary care patients), as shown in Table 1.

Participants, who had a mean age of 40.4 years and BMI of 30.0 kg/m², were assigned to (1) group behavioral counseling, delivered by registered dietitians in 26 one-hour sessions; (2) the same intervention combined with meal replacements, which have been shown to increase weight loss compared with the use of conventional reducing diets; or (3) PCP counseling delivered in 26 brief (10–15 min) biweekly sessions that included the use of meal replacements. All participants received the LEARN manual, which was the basis of counseling sessions. At one year, patients who received group treatment, with or without meal replacements, lost 7.7 kg and 3.4 kg, respectively, whereas those treated by PCPs lost 3.5 kg (the first condition was superior to the two others, P = 0.03; these results are for a completers’ analysis). Further study is needed to determine whether the 3.5 kg loss achieved by PCPs was attributable to the high frequency of visits (i.e., 26 in one year), the use of meal replacements, or the combination of the two factors.

**Brief PCP counseling plus pharmacotherapy**

Trials in academic medical centers have shown that adding weight loss medication to lifestyle counseling increases mean weight loss. Three RCTs examined the effectiveness of lifestyle counseling plus pharmacotherapy, provided by PCPs as part of interventions that modeled brief office visits in primary care. Hauptman et al. studied the effectiveness of orlistat (a gastric and pancreatic lipase inhibitor) in primary care patients, with a mean age of 42.5 years and BMI of 36 kg/m², who were randomly assigned to placebo, 60 mg of orlistat TID, or 120 mg of orlistat TID. All patients were prescribed a reduced-calorie diet during year one and a weight-maintenance diet during year two. They also received brief dietary guidance from their PCPs, along with educational videotapes and printed materials. As shown in Table 1, weight losses at month 24 were 1.7, 4.5, and 5.0 kg for the three groups, respectively (P = 0.001 for both orlistat groups compared to placebo).

Poston et al. also tested orlistat in a primary care simulated study of patients with an average age of 41.0 years and BMI of 36.1 kg/m². Participants were randomly assigned to brief weight loss counseling alone, consisting of 15- to 20-min monthly sessions with a nurse or registered dietitian, orlistat alone (120 mg TID), or the combination of brief weight loss counseling and orlistat. Patients in the counseling arms received the LEARN manual. At 12 months, the groups that received orlistat alone or combined with brief weight loss counseling both lost a mean of 1.7 kg, compared with a gain of 1.7 kg for lifestyle counseling alone (P < 0.001 for both orlistat groups compared to counseling alone). There were no significant differences between the two medication groups.

In a similar study, Wadden et al. assessed the effects of sibutramine, a serotonin–norepinephrine reuptake inhibitor, which was removed from the market in 2010 because of concerns that it increased the risk of cardiovascular events. Patients had a mean age of 43.6 years and BMI of 37.9 kg/m² and were randomly assigned to sibutramine (10–15 mg daily), accompanied by eight brief PCP visits over 12 months to monitor blood pressure and pulse, or sibutramine plus brief PCP lifestyle counseling, provided during the eight brief visits. Patients in the latter group completed homework assignments from the LEARN manual, including daily food and activity records. Patients who received sibutramine plus PCP counseling lost significantly more weight at week 18 than did those who received sibutramine alone (8.4 kg vs. 6.2 kg, P = 0.05). At month 12, however, differences between groups were no longer significant.
Summary

These three studies suggest that the addition of pharmacotherapy to brief PCP-delivered lifestyle counseling will increase the likelihood that patients achieve clinically meaningful weight loss (≥5% of initial weight), as compared with brief counseling alone. This conclusion, however, is tempered by the fact that sibutramine was removed from the market, and there have not been trials, in primary care settings, of two newly approved weight loss medications. Studies are needed to determine whether lorcaserin, as well as the combination of phentermine/topiramate, significantly improve weight loss when added to brief PCP lifestyle counseling, compared with counseling alone. Cost-effectiveness analyses will be required in these trials, given the expense of the medications.

Collaborative obesity treatment within primary care practice

Four recent studies evaluated the effectiveness of collaborative obesity treatment, in which auxiliary health professionals were trained to provide weight loss counseling in conjunction with a PCP who addressed patients’ routine medical care. Tsiatis et al. developed a model in which medical assistants served as lifestyle interventionists (coaches). Patients, with a mean age of 49.5 years and BMI of 36.5 kg/m², were randomly assigned to a control group, consisting of quarterly PCP visits and printed weight loss materials, or to brief counseling, which included quarterly PCP visits, along with eight brief (15–20 min) counseling sessions with a trained medical assistant. The lifestyle intervention was adapted from the Diabetes Prevention Program (DPP). At six months, patients in the brief counseling and control groups lost 4.4 kg and 0.9 kg, respectively (P < 0.001). In addition, 48% of patients in the former group lost 5% or more of their weight, compared to 0% in the control group (P = 0.0001). However, as shown in Table 2, there were no significant differences between groups at a one-year follow-up (as a result of weight regain following treatment termination at month six).

Wadden et al. expanded on the previous study by assessing the effects of brief monthly lifestyle counseling, delivered by medical assistants, over a two-year period. This investigation was one of three independent, yet coordinated trials (collectively known as the Practice-based Opportunities for Weight Reduction (POWER) trials) that were funded by the NHLBI to test the effectiveness of behavioral weight loss counseling in primary care settings. Participants had a mean age of 51.5 years and BMI of 38.5 kg/m² and were randomly assigned to (1) usual care, consisting of quarterly PCP visits and printed weight loss materials, (2) brief lifestyle counseling, consisting of quarterly PCP visits combined with brief monthly counseling sessions with a trained medical assistant, or (3) enhanced brief lifestyle counseling, which was the same as the second arm, but allowed patients to use meal replacements or weight loss medication (orlistat or sibutramine). The medical assistants followed abbreviated lessons adapted from the DPP, with visits of 10–15 minutes. Weight losses in the three groups at month six were 2.0, 3.5, and 6.6 kg, respectively, with all three groups differing significantly (P < 0.05) from each other. As shown in Figure 2, weight losses at 24 months were 1.7, 2.9, and 4.6 kg, respectively. Weight decreased by ≥5% in 21.5, 26.0, and 34.9% of patients in the three groups, respectively. Enhanced brief lifestyle counseling was superior to usual care on both measures of success (P = 0.003 and P = 0.02, respectively). A secondary analysis that removed participants treated by sibutramine, and examined those treated principally by meal replacements, revealed a loss of 4.1 kg in the enhanced counseling group (which differed significantly from usual care; P < 0.05).

Kumanyika et al. compared the results of low-versus moderate-intensity behavioral counseling, as defined by the Task Force (i.e., < monthly contact vs. once-a-month sessions). Patients had a mean age of 47.2 years and BMI of 37.2 kg/m² and were randomly assigned to either low-intensity care, consisting of brief PCP counseling every four months, or to moderate-intensity care, which included brief PCP counseling every four months, plus brief (15–20 min) monthly lifestyle counseling visits with a trained auxiliary provider (e.g., medical assistant). At one year, patients in the two groups lost 0.6 kg and 1.6 kg, respectively (P = 0.15).

A study by terBogt et al. compared weight losses in patients, with an average age of 56.1 years and BMI of 29.6 kg/m², assigned to either usual care or lifestyle counseling with a NP. The counseling arm consisted of four face-to-face visits and one telephone session with the NP, who followed a set of computerized treatment guidelines. At month
Table 2. Studies of collaborative obesity care that included auxiliary health professionals in the site's primary care practice

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Interventions</th>
<th>Number of treatment visits</th>
<th>Months of postrandomization follow-up</th>
<th>Weight change at month 6, kg</th>
<th>Weight change at follow-up, kg</th>
<th>≥5% loss of initial weight at follow-up, % of subjects</th>
<th>Attrition at follow-up, %*</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCP + auxiliary health professionals</td>
<td></td>
<td>1. Brief PCP counseling</td>
<td>4</td>
<td>12</td>
<td>—</td>
<td>—</td>
<td>10.2*</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Brief PCP counseling + MA counseling</td>
<td>16</td>
<td>12</td>
<td>—</td>
<td>—</td>
<td>22.5b</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>261</td>
<td>ter Bogt et al.43</td>
<td>457</td>
<td>12</td>
<td>—</td>
<td>—</td>
<td>10.2*</td>
<td>28</td>
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<td></td>
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<td>—</td>
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<td>2. Quarterly PCP visits + MA counseling</td>
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<td>12</td>
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<td>10.2*</td>
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<td></td>
<td></td>
<td>2. Brief lifestyle counseling (quarterly PCP visits + MA counseling)</td>
<td>33</td>
<td>24</td>
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<td>—</td>
<td>10.2*</td>
<td>28</td>
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<td>3. Enhanced brief lifestyle counseling (quarterly PCP visits + MA counseling + meal replacements/medication)</td>
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<td>24</td>
<td>—</td>
<td>—</td>
<td>10.2*</td>
<td>28</td>
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<td>10.2*</td>
<td>28</td>
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<tr>
<td></td>
<td></td>
<td>2. Counseling + meal replacements + medication</td>
<td>46</td>
<td>24</td>
<td>—</td>
<td>—</td>
<td>10.2*</td>
<td>28</td>
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</table>

Note: Values shown for weight change are mean ± SEM. For each study, under “weight change” (at month 6 and at follow-up) and “≥5% loss of initial weight at follow-up,” values labeled with different letters (a, b, c) are significantly different from each other at P < 0.05.
*Attrition is defined as the percentage of participants who did not contribute an in-person weight at the end of the study. An intention-to-treat analysis was used in these studies.
**Weight losses represent percentage weight change.
†In this study, lifestyle counseling was provided by a registered dietitian, social worker, professional counselor, or marriage and family therapist who was not necessarily from the primary care practice site.
PCP, primary care provider; MA, medical assistant; NP, nurse practitioner.

12, participants in the intervention and usual care groups lost 1.9% and 0.9% of initial weight, respectively (P < 0.05).

Summary
The results of these four studies21,40,42,43 suggest that collaborative obesity treatment that incorporates auxiliary health providers as lifestyle coaches is modestly more effective than PCP counseling alone in treating obesity in primary care settings. The greater weight loss is probably attributable to the greater frequency of visits offered by auxiliary health professionals (typically monthly) as compared with PCPs (typically quarterly). However, weight losses remained modest with collaborative treatment, ranging from 1.6 to 4.6 kg in the intervention arms. The most favorable results were observed with patients who received monthly lifestyle
counseling from medical assistants, combined with meal replacements or weight loss medication.\textsuperscript{40}

The benefit of increasing the number of treatment modalities (e.g., meal replacements, pharmacotherapy), as well as treatment intensity (i.e., high-frequency visits), was demonstrated by Ryan \textit{et al.}\textsuperscript{44} in a pragmatic trial that created obesity specialty clinics for extremely obese patients covered by a common insurance plan. Patients had a mean age of 47.2 years and median BMI of 46.1 kg/m\textsuperscript{2}. They were self-referred to one of seven regional specialty clinics, established at existing primary care practices, and were randomly assigned to either usual care, which included instructions for an internet weight loss website, or an intensive medical intervention, which initially consisted of a three-month low-calorie, liquid diet (890 kcal/day), followed for the next four months by 10 sessions of group behavior modification, combined with weight loss medication (e.g., sibutramine, orlistat, or diethylpropion). From months 8–24, participants were offered monthly group lifestyle modification, weight loss medication, and one meal replacement per day. Lifestyle counselors were drawn, when possible, from primary care staff and included a registered dietitian, social worker, professional counselor, and marriage and family therapist. As shown in Table 2, patients in the intervention group lost 8.3\% of initial weight at month 24, compared with 0\% for the control group (\textit{P} < 0.001), as determined by a last-observation-carried-forward analysis. (Data also were analyzed using a baseline-carried-forward analysis, in view of two-year attrition of approximately 50\%, and revealed mean losses of 4.9\% and 0.2\%, respectively.) These results indicate that PCPs can be trained to provide treatments that will induce clinically meaningful weight loss in their obese patients. Additional study is required to determine whether such treatment is cost-effective, compared with other interventions that may be available in the community.

**Collaborative obesity treatment supported by remotely delivered counseling**

Behavioral weight loss counseling is increasingly being delivered by telephone,\textsuperscript{45–47} smart phones,\textsuperscript{18} and the Internet.\textsuperscript{49,50} Remotely delivered counseling induces somewhat smaller weight losses than face-to-face interventions\textsuperscript{50} but appears to be less expensive and more convenient for patients (i.e., no travel costs) and capable of reaching more individuals (particularly those in rural areas). Remote delivery, using call centers and similar methods, also could appeal to primary care practices by reducing patient volume at the site, while also providing external expertise (i.e., weight loss counseling) that primary care staff may not possess. Technological advances also could allow call center staff to communicate patients’ progress to primary care staff,
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if the two parties were part of an integrated health system.

Five studies \(^{47,51–54}\) have examined the use of remotely delivered counseling with patients in primary care practices (see Table 3). Appel et al.\(^ {47}\) examined the effectiveness of a behavioral weight loss intervention delivered remotely or in-person, in both cases by interventionists not affiliated with the primary care practices. (This investigation was one of the POWER trials, described previously.) Patients, with a mean age of 54.0 years and BMI of 36.6 kg/m\(^2\), were randomly assigned to (1) a control group, in which weight loss was self-directed; (2) remote support only, consisting of a behavioral weight loss intervention delivered by phone (i.e., 12 initial weeks of 20-min calls, followed by similar monthly calls), e-mail, and Internet; or (3) in-person support, which included the same components provided in the second arm, with the addition of individual and group counseling sessions (participants in the two intervention groups were offered a total of 33 and 57 treatment contacts, respectively). Trained health coaches delivered both interventions. At month 24, weight losses in the three groups were 0.8, 4.6, and 5.1 kg, respectively (see Fig. 3). Weight decreased by 5% or more in 18.8, 38.2, and 41.4% of patients in the three groups, respectively. Both intervention groups were superior to usual care on both measures of success (\(P < 0.001\)).

Logue et al.\(^ {51}\) conducted a two-year study of a telephone-delivered weight loss intervention in primary care practice. Overweight and obese patients, ranging in age from 40 to 60 years, were randomly assigned to either augmented usual care, consisting of 10-min, semiannual counseling sessions with a dietitian, or transtheoretical model-chronic disease care, which included the same components as the first arm, accompanied by 15-min monthly telephone calls with a weight loss advisor trained in stages-of-change interventions. Patients in the latter group also were mailed stage-specific, behavioral weight loss materials. After two years, weight losses in the two groups were 0.2 kg and 0.4 kg, respectively (\(P = 0.5\)).

Ely et al.\(^ {52}\) examined the treatment of obesity in rural primary care settings. Patients, with an average age of 49.5 years and BMI of 36 kg/m\(^2\), were randomly assigned to either usual care, which included educational weight loss materials, or a chronic care intervention consisting of eight telephone-delivered

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**Figure 3.** Mean weight change according to randomized group (Call-Center–Directed = remote support only; In-Person–Directed = in-person support; Self-Directed = control). At month 24, both intervention groups lost significantly more weight than the control group (\(P < 0.001\)), with no significant difference between the intervention groups. Reprinted from Ref. 47.
motivational interviewing sessions with a masters-level counselor. PCPs also provided personalized weight loss recommendations to patients in the latter group. Weight losses at month six were 1.0 kg and 4.3 kg for the usual care and intervention groups, respectively (P = 0.01).

In another POWER trial, Bennett et al.\textsuperscript{53} tested the effectiveness of a primary care intervention in predominantly low-income patients with hypertension. Patients, with a mean age of 54.5 years and BMI of 37 kg/m\textsuperscript{2}, were randomly assigned to either usual care or a behavioral intervention for weight loss and hypertension self-management. The intervention was delivered through a study-specific website and an interactive voice response system, both of which provided patients with tailored feedback. Patients in the intervention group also were offered 12 group support sessions and received 18 telephone-counseling calls from trained community health educators. Weight losses at month 24 were 0.5 kg and 1.5 kg in the usual care and intervention groups, respectively (P < 0.05).

Bennett et al.\textsuperscript{54} also examined the effects of a web-based intervention in primary care patients with hypertension, who had a mean age of 54.4 years and BMI of 34.6 kg/m\textsuperscript{2}. Patients were randomly assigned to (1) usual care, which included printed weight loss materials; or (2) a comprehensive weight loss website that promoted behavior change. Patients in the latter group also received four 20-min motivational coaching sessions delivered by a dietitian, two in-person and two by telephone. At week 12, those in the intervention arm lost 2.3 kg, compared with a gain of 0.3 kg for usual care (P < 0.05).

**Summary**

These five trials\textsuperscript{47,51–54} suggest that primary care practices can help their patients achieve clinically meaningful weight loss by offering remotely delivered, high-intensity behavioral counseling. Appel et al.\textsuperscript{57} obtained the most promising results, in which 12 weekly telephone sessions, followed by monthly calls thereafter, induced a mean loss of 6.1 kg at month six, with maintenance of a 4.6 kg loss at month 24. However, these patients also received an interactive-web based program in which they recorded their weight, food intake, and physical activity. Thus, the efficacy of telephone-based counseling alone cannot be determined in the present study. Ely et al.,\textsuperscript{52} however, also obtained an average 4.3 kg weight loss in six months in a program that provided eight telephone counseling sessions during this time. Studies that provided moderate- or low-intensity phone counseling (often combined with other electronic contact) generally produced smaller weight losses, although randomized trials are needed to assess the effects of intervention intensity. Further studies of call-center–delivered behavioral counseling, which include a cost analysis, clearly are warranted.

**Referral options in the community for PCPs**

The right-hand side of Figure 1 shows referral options in the community that are available to PCPs and their patients. These include a variety of community\textsuperscript{55,56} and commercial-based programs,\textsuperscript{57,58} many of which provide face-to-face meetings and increasingly offer telephone- or Internet-supported counseling. Alternatively, PCPs may refer patients to professionals who specialize in obesity management, including registered dietitians, psychologists, exercise specialists, and bariatric physicians or surgeons. The next few sections only briefly summarize these options. Interested readers are referred to more thorough reviews.\textsuperscript{4,8,59}

**Commercial programs**

Two studies\textsuperscript{57,58} evaluated the effectiveness of a commercial program with patients referred from primary care practices. Jebb et al.\textsuperscript{57} compared the weight losses of 772 patients, with a mean age of 47.4 years and BMI of 31.4 kg/m\textsuperscript{2}, who were randomly assigned to either usual care (as provided in their primary care practice) or Weight Watchers. Patients assigned to the latter group were given one year free access to an in-person Weight Watchers program in their area. (Weight Watchers offers weekly group support meetings, in combination with a balanced, reduced-calorie diet and instruction to increase physical activity.) At month 12, mean weight losses were 1.8 kg and 4.1 kg in the usual care and Weight Watchers groups, respectively (P < 0.0001). Approximately 25% and 45% of participants in the two groups lost 5% of initial weight (P < 0.05).

Jolly et al.\textsuperscript{58} compared the effectiveness of usual care to several commercial weight loss programs offered in the United Kingdom. A total of 740 overweight/obese adults, referred from primary care.
Table 3. Studies of collaborative obesity care supported by remotely delivered counseling

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Interventions</th>
<th>Number of treatment visits</th>
<th>Months of postrandomization follow-up</th>
<th>Weight change at month 6, kg</th>
<th>Weight change at follow-up, kg</th>
<th>≥5% loss of initial weight at follow-up, % of subjects</th>
<th>Attrition at follow-up, %∗</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appel et al.57</td>
<td>415</td>
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<td>−0.8 ± 0.6a</td>
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<td>3. In-person support (telephone + electronic-based + in-person counseling)</td>
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<td>0.3 ± 0.3a</td>
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<td>−2.3 ± 0.5b</td>
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<td>−1.5 ± 0.4b</td>
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<td>−1.0 ± 0.9a</td>
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<td>6</td>
<td>—</td>
<td>−4.3 ± 0.8b</td>
<td>—</td>
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<td>Logue et al.51</td>
<td>665</td>
<td>1. Brief RD counseling</td>
<td>4</td>
<td>24</td>
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<td>−0.2 ± 0.4c</td>
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<td>2. Brief RD counseling + telephone counseling</td>
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<td>24</td>
<td>—</td>
<td>−0.4 ± 0.4b</td>
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<td>38</td>
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</table>

Notes: Values shown for weight change are mean ± SEM. For each study, under “weight change” (at month 6 and at follow-up) and “≥5% loss of initial weight at follow-up,” values labeled with different letters (a, b) are significantly different from each other at P < 0.05. ∗Attrition is defined as the percentage of participants who did not contribute an in-person weight at the end of the study. An intention-to-treat analysis was used in most studies, except for one that used a completers’ analysis.22

RD, registered dietitian.

care practices, were randomly assigned to one of six programs: Weight Watchers; Rosemary Conley; Slimming World; National Health Service (NHS) Size Down; general-practice counseling (in primary care); and pharmacy-based counseling. A seventh randomized arm allowed participants to choose a weight loss program from the six options. Weight losses at 12 weeks ranged from 1.4 kg (general practice counseling) to 4.4 kg (Weight Watchers). Weight Watchers and another commercial program (Rosemary Conley) were superior to the exercise-only comparator group (2.0 kg; P = 0.001 for Weight Watchers). Additional data supporting the effectiveness of Weight Watchers in primary care patients were reported from a retrospective, uncontrolled study by Mitchell et al.60

The efficacy of other commercial programs was examined previously by Tsai and Wadden.59 Since that report, both Jenny Craig61,62 and Nutrisystem63 have been evaluated in randomized trials, ranging from three to 24 months. These studies were not conducted in primary care practices, but the generally favorable results would appear relevant to PCPs and their patients. Cost data are needed to help primary care health systems, insurers, and obese individuals identify which programs are both effective and affordable.

Obesity specialists
PCPs also can refer patients to obesity specialists in the community who can provide more targeted evaluation and additional options for treatment.
Specialists include registered dietitians, particularly those who have completed the American Dietetic Association’s Weight Management Certification Program, which provides training in the delivery of evidence-based interventions (http://www.cdrnet.org/wtmgmt/CertificateOfTraining.cfm). Bariatric physicians frequently prescribe weight loss medications, such as phentermine and orlistat, and likely soon will include the newly approved lorcaserin and the combination of phentermine and topiramate. To achieve optimal weight loss, medications must be prescribed in combination with behavioral counseling and must be taken long term to facilitate the maintenance of lost weight.

Medically supervised low- and very-low-calorie diets are another option offered by bariatric physicians. Numerous studies have reported mean losses of 15–25% of initial weight with these approaches, but patients usually regain 35–50% of their weight within two years following treatment. As a result, few long-term differences in weight loss have been detected in patients prescribed very-low-calorie diets (< 800 kcal/d) versus more moderately restricted diets of conventional food (1,000–1,800 kcal/day). Medically supervised programs also are likely to cost more than $100 per week, when the costs of food and physician monitoring are included.

PCPs may consider bariatric surgery with patients with extreme obesity (BMI ≥ 40 kg/m²) who have not been successful with lifestyle modification and pharmacotherapy. Patients with a BMI ≥ 35 kg/m² and comorbid medical conditions also may qualify for surgery. In addition, the FDA has approved laparoscopic adjustable gastric banding (LAGB) for patients with a BMI of 30–34.9 kg/m² and type 2 diabetes (although it currently is unclear whether insurance companies will reimburse the cost of surgery for this population). The most commonly used procedures in the United States are Roux-en-Y gastric bypass (RYGB), LAGB, and sleeve gastrectomy (SG). RYGB produces long-term (≥2 years) weight loss of 25–30% of initial weight and LAGB of about 15–20%, with SG generally falling in between. Weight loss achieved with bariatric surgery is associated with improvements in comorbid conditions, particularly with the remission of type 2 diabetes in patients who undergo RYGB. However, bariatric surgery also carries the highest risk of complications, including perioperative mortality, among the weight loss options considered in this review. Patients also may regain their weight if they fail to adhere to the postoperative diet.

Conclusions and future directions

The provision of behavioral weight loss counseling by PCPs and auxiliary health providers in primary care practices has met with limited success, in most cases producing mean weight losses of only 1–3 kg in 6–24 months of intervention. These modest weight losses are most likely attributable to infrequent treatment contacts, typically at monthly to quarterly intervals, as well as to the brief duration of visits, usually 10–15 min. This low intensity of treatment may be all that can be readily accommodated in busy outpatient practices, in which providers must respond to a variety of acute illnesses that may seem more pressing than obesity.

The low-intensity treatments tested in primary care settings contrast sharply with the weekly group and individual interventions (with 30- to 90-minute sessions) that have been delivered by weight loss specialists (e.g., registered dietitians, psychologists) in academic medical centers and that have produced mean losses of 7–10% of initial weight. It is not fair to compare the results of (underfunded) pilot studies conducted in primary care with findings from costly efficacy trials that often are implemented without sufficient thought concerning whether the intervention can be widely disseminated. However, the efficacy trials do tend to underscore the importance of frequent patient-provider contact (i.e., high-intensity interventions), as revealed by the task force’s review.

CMS’s mandate that primary care providers offer high-intensity behavioral interventions to their obese patients, thus, seems appropriate, given the importance for weight loss of frequent patient-provider contact. CMS’s provision of 14 counseling sessions during the first six months is close to the 16 visits provided in the DPP in the first six months, at which time participants lost a mean of 7 kg. However, the decision to provide 15-min visits with PCPs, rather than the 30-min sessions used in the DPP, is not supported by sufficient evidence demonstrating the efficacy of the shorter visits. Moreover, as revealed by the present review, there is little evidence that physicians, NPs, and PAs can help most obese patients achieve clinically meaningful weight losses (≥5% of initial weight).
et al., reviewed above, comes closest to meeting CMS’s proposed treatment paradigm. For one year, patients had brief (10- to 15-min), every-other-week visits with a physician or nurse who provided behavioral weight loss counseling (following the LEARN Manual), combined with the use of meal replacements (provided free of charge). Participants lost a mean of only 3.5 kg at the end of the year, despite being provided the 26 office visits and the meal replacements, the latter which usually increase weight loss by 30% or more compared with the consumption of a conventional reducing diet.

Physicians, NPs, and PAs in primary care undoubtedly could be instructed in delivering effective behavioral weight loss counseling, in the same manner that auxiliary health professionals were trained to do so in several of the studies reviewed above. However, other professionals, particularly registered dietitians, already possess the knowledge and skills required to provide effective behavioral counseling and can do so at a substantially lower cost than physicians and the other providers currently approved by CMS. Ultimately, physicians and their health care practices must decide whether they can afford to spend their time providing behavioral weight loss counseling, with its demand for weekly and then twice-monthly sessions for the first six months. Practices would have to hire more physicians, NPs, and PAs to provide routine medical care to patients whose former PCPs’ schedules were now filled delivering behavioral weight loss counseling. Hiring registered dietitians and other lifestyle interventionists to counsel obese patients would appear to make more economical sense for primary care practices, integrated health systems, and CMS than deploying physicians, NPs, and PAs in this effort.

Remotely delivered, high-intensity behavioral weight loss counseling was perhaps the most promising approach identified by this review. Appel et al., found that 12 weekly telephone sessions (20-min), followed thereafter by monthly calls, induced a mean loss of 6.1 kg at six months and of 4.6 kg at 24 months. These losses were equivalent to those of participants who were offered a traditional face-to-face intervention that combined group and individual visits. Participants in Appel’s study also received an Internet-based program. However, additional trials, conducted outside of primary care practices which used telephone-counseling alone, have found equivalence of this approach with comparable on-site interventions.

Remotely delivered lifestyle counseling, whether provided by a primary care practice, or by a call center with which it has contracted, would appear to be a very convenient option for patients. More important, it would support PCPs in their efforts to offer intensive behavioral counseling, as recommended by the Task Force, without overwhelming the practice schedules of already harried providers. Further study is needed to determine whether remotely delivered weight loss counseling is as effective as it appears to be and can delivered, at a minimum, at a lower cost than CMS pays for on-site counseling delivered by PCPs.

Acknowledgments
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Conflicts of interest
Thomas Wadden serves on advisory boards for Novo Nordisk and Orexigen Therapeutics, each of which is developing weight loss medications. None of the other authors have any potential conflicts of interest to disclose.

References
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