

Adult Behavioral Weight Loss Treatment

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In the United States, obesity is the second leading cause of preventable death^{1,2} and associated with increased risk of developing hypertension, Type 2 diabetes, cardiovascular disease and death, stroke, as well as a variety of cancers, urinary incontinence, arthritis, and sleep apnea.^{3,4} Fortunately, even modest weight loss of 7-10% of body weight among obese individuals can improve blood pressure, high-density lipoprotein-cholesterol, low-density lipoprotein-cholesterol, triglycerides, blood glucose levels, increased cardiorespiratory fitness, and quality of life.⁵⁻⁸

The **Diabetes Prevention Program (DPP)**⁷ and the ongoing **Look AHEAD (Action for Health in Diabetes)** trial support the benefits of modest weight losses. In DPP, participants with impaired glucose tolerance (or “pre-diabetes”) were randomly assigned to receive an intensive lifestyle intervention, pharmacotherapy or placebo. Participants in the lifestyle condition achieved a 7% weight loss at 6 months and maintained a 5% weight loss at 3 years; these weight losses reduced their risk of developing Type 2 diabetes by 58%. The lifestyle intervention was nearly twice as effective as medication in reducing the incidence of diabetes.^{7,9} Look AHEAD, an NIH-funded clinical trial, was designed to investigate the impact of weight loss on cardiovascular morbidity and mortality in over 5000 individuals with Type 2 diabetes. Participants were randomly assigned to either a **lifestyle intervention (ILI)** or a **diabetes education and support control (DSE)** group and followed over 12 years. Although long-term data are not yet available, early findings are striking. At one year, ILI participants lost an average of 8.6% of their weight compared to 0.7% in the DSE group, and improvements in mean fitness also were significantly better in the ILI condition.¹⁰ Moreover, these changes were associated with improved diabetes control (i.e. HbA_{1c} levels) and CVD risk factors (i.e. blood pressure, triglycerides, HDL-cholesterol, and urine albumin / creatinine), and reduced medication use in the ILI group compared to the DSE group. These studies demonstrate that behavioral weight loss interventions consistently produce weight losses of 7-10% of initial body weight and such weight losses are associated with substantial health benefits.

KEY COMPONENTS OF BEHAVIORAL WEIGHT CONTROL

Behavioral weight loss treatments like those used in DPP and Look AHEAD (also referred to as “lifestyle interventions”, or “standard behavioral treatment”) focus on changing diet and physical activity to promote weight loss, and emphasize behavioral strategies and skills to implement and maintain these lifestyle changes.⁸ The goal is to produce a 10% reduction in body weight, with a weekly goal of between 0.5-1.0 kg / week.⁸ Treatment programs are relatively standard and are administered in a closed group format using treatment manuals; the sessions are typically led by behavioral psychologists, dietitians, and/or exercise physiologists and include structured lessons on nutrition education, physical activity, and behavioral skills. Groups have somewhere between 10 and 20 patients and meet for 60-90 minutes weekly for 20-24 weeks; many programs also offer biweekly or monthly sessions for another 20-52 weeks because continued contact and accountability is associated with better long-term weight loss.¹¹ Decades of research have identified several areas that are essential to long-term weight control, including a calorie restricted diet, engaging in high levels of physical activity, and self-monitoring of key behaviors.

Dietary Prescriptions

Most behavioral programs emphasize a moderately restricted calorie diet based on the participant’s initial body weight; i.e., 1200-1500 calories, and 30% calories from fat. Initially, a sample meal plan is often provided. Nutrition lessons focus on label-reading and portion control, as well as education about energy balance and how to make healthy food choices while staying within the calorie prescription. Participants are encouraged to use meal replacement products such as low calorie frozen entrees, meal replacement bars and shakes, as well as other pre-portioned packaged foods (e.g., yogurt, individual packets of oatmeal). The use of such products lets participants track calories throughout the day without having to weigh and measure foods.

Physical Activity

Physical activity is one of the best predictors of longer-term weight control, and is a critical element of behavioral programs, particularly in the maintenance phase. In standard programs,

participants are instructed to increase their physical activity gradually until achieving at least 200 minutes per week in moderate intensity activity (i.e. at least 40 minutes a day 5 times per week). Participants are encouraged to do an activity similar to brisk walking and are allowed to accumulate time spent in multiple short bouts of activity (at least 10 minutes in length). Many behavioral programs give participants pedometers or encourage them to purchase pedometers, with the goal of achieving at least 10,000 steps per day.

Data from the **National Weight Control Registry (NWCR)**, a self-selected group of over 5000 adults who have on average lost over 70 pounds and maintained it almost 6 years, suggest that levels of physical activity much higher than typically prescribed may be necessary to sustain long-term weight loss. On average, NWCR members reported expending approximately 2800 kcal/week,¹² markedly higher than the 1000 kcal/week typically prescribed in standard behavioral weight loss programs. This translates to roughly 60-90 minutes of moderately intense PA on 6 days / week, and is consistent with the 60-90 minutes of daily activity recommended in recent public health guidelines for the *maintenance* of weight loss.¹³ In a recent randomized clinical trial, Jeffery and colleagues¹⁴ compared the effects of a moderate (i.e. 1000 kcal/week) versus a high (i.e., 2500 kcal/week) exercise prescription within a weight loss program; those in the high exercise group achieved better long-term weight losses at 12 and 18 months.

Self-Monitoring

Self-monitoring is an essential component of behavioral weight loss and has been associated with successful long-term weight loss.¹⁵⁻¹⁶ Participants are instructed to keep detailed records of their dietary intake, including the calories and fat grams in all foods and beverages they consume, as well as their minutes of structured activity and their weight. A food diary increases patients’ awareness of their food choices and highlights problematic eating patterns. Programs that provide pedometers ask participants to record the number of steps they take each day in their diary. At the end of the first week, the days are averaged and participants are encouraged to add 250 steps per day each successive week, until reaching 10,000 steps per day.

Recent studies support frequent self-monitoring of weight.^{12,17-18} In fact, 44% of NWCR members reported weighing themselves daily,¹² and more recent findings with registry participants indicate that decreased frequency of self-weighing is independently associated with greater weight regain over time.¹⁹ Within standard programs, patients are instructed to self-monitor their weight at least weekly and no more than once per day. The scale provides participants with information about the effects of eating and exercise behaviors and serves as a cue for action. When their weight is in the desired range, we encourage patients to reward themselves in some small way (e.g., a new book). If their weight is not within the desired range, we encourage patients to make additional changes in their behaviors.

OTHER KEY BEHAVIOR MODIFICATION SKILLS

Stimulus control: Patients are taught to reduce the cues that prompt eating and increase the cues that encourage physical activity. For example, patients are instructed to reduce the visibility of high fat foods in the home and increase the visibility of cues for exercise, such as sneakers or work-out equipment.

Problem-solving: Patients are taught to deal with situations that make it difficult to reach healthy eating and activity goals.

Goal setting: The importance of both short- and longer-term goal setting is emphasized in behavioral weight control. Daily and weekly goals for eating and activity behaviors and weight loss are encouraged, and patients are taught to set these goals using the S.M.A.R.T. principle: specific, manageable, attainable, realistic, and time-limited.

Social support and assertiveness training: Patients are taught the importance of developing and maintaining social support for behavior changes made during the program, and are encouraged to access support both within the group and in their home and work environments. Furthermore, patients learn how to assert themselves in social situations as it relates to eating and activity.

Cognitive restructuring: Patients are taught how to identify and modify maladaptive thoughts that may contribute to overeating and physical inactivity. For example, negative thoughts can take the form of dichotomous thinking (e.g., "If I'm not able to exercise for 45 minutes, I might as well not do it at all") and rationalization (e.g., "It's been a really tough week, I deserve to eat whatever I want tonight"). Patients are taught to identify their own thinking patterns and

challenge / replace negative thoughts with more realistic / adaptive statements.

Relapse prevention: Based on Marlatt and Gordon's theory of relapse,²⁰ behavioral programs emphasize that slips are a natural part of the weight loss process, and we teach patients to anticipate problematic situations and plan strategies for coping with these situations.

RESEARCH AT THE WEIGHT CONTROL AND DIABETES RESEARCH CENTER

At the Weight Control and Diabetes Research Center (WCDRC), our primary aim is to develop methods for the prevention and treatment of obesity and related medical illnesses. We provide services to members of the community free of charge through our ongoing clinical trials. Currently, we are working to improve upon existing treatments: 1) by targeting high-risk groups and tailoring treatment to them; 2) by modifying the home environment; 3) by adding individual sessions as an adjunct to group treatment; and 4) by testing different dietary prescriptions. Ongoing studies in these areas are described briefly below.

TARGETING HIGH RISK GROUPS

Young adults are at particularly high risk for weight gain and obesity. The average weight gain that occurs between the ages of 18 and 35 is 30 pounds, and the largest gains tend to oc-

cur among those who are already overweight. Despite increased risk, young adults are typically underrepresented in standard treatment programs and little is known about what treatments will be most effective with this age group. We recently conducted a pilot study in which we targeted young adults between the ages of 21 and 35. *Live Well* was a brief (10-week) program tailored to address problem areas of particular relevance to young adults, such as fast food, alcohol and sweetened beverage consumption. In preliminary findings, participants achieved significant weight losses at post-treatment, and on average, maintained those losses at 10-week follow-up. Frequent weighing was associated with greater magnitude of weight loss at follow-up, suggesting that, similar to older adults, self-weighing may be an important weight control tool for this age group. Additional studies designed to improve recruitment and treatment success for young adults are in the planning stages.

[*Latinos are at increased risk for obesity, and studies designed to treat this group are also ongoing at the WCDRC. See the Marquez, Leabey, and Wing article in this issue for details.*]

MODIFYING THE HOME ENVIRONMENT

One of the central tenets of adult behavioral weight control is that cues in the environment are important determinants of

Table 1. Key Components of Adult Behavioral Weight Loss Treatment

Dietary Prescriptions

- Low calorie, low fat diet
- 1200-1500 calories per day, depending on initial weight
- No more than 30% calories from fat

Physical Activity Prescriptions

- Gradually build up to at least 200 minutes / week of structured activity
- Emphasis on moderate intensity aerobic activity (e.g., brisk walking)
- Increase lifestyle activity (e.g., take stairs instead of elevator)
- Aim to exercise at least 5 of 7 days each week

Self-Monitoring

- Keep detailed food records
- Track minutes of structured activity
- Wear a pedometer and work toward goal of 10,000 steps daily
- Weigh frequently (no more than once per day)

Other Behavioral Skills

- Stimulus control
- Goal setting
- Problem solving
- Cognitive restructuring
- Social support and assertiveness training
- Relapse prevention

behavior. An ongoing randomized clinical trial focuses on helping participants modify their home environments. In *Lifestyle Eating and Activity Program (LEAP)*, an 18-month behavioral program, participants are randomized either to a standard care group or a modified home environment group. Participants in the *LEAP at Home* group receive help with making physical modifications to their homes (e.g., exercise equipment and serving/measuring equipment are provided if not readily available) and also have a support partner from their home (e.g., spouse, child) who attends all group meetings and actively engages in the weight loss program with them.

INCORPORATING INDIVIDUAL SESSIONS AS AN ADJUNCT TO GROUP TREATMENT

Group obesity treatment has been shown to produce greater weight losses than individual treatment, and is as effective in improving psychological functioning as well; therefore, standard programs are conducted in a group format. However, those individuals who do not experience early success in standard programs (i.e. not meeting weekly weight loss goals during the early weeks of treatment) tend not to fare as well over the course of the program. We are currently conducting a randomized trial to examine whether providing individual “getting back on track” sessions for participants will improve their overall weight loss. In the *Strive for 5* program, participants are randomized to either a standard behavioral or modified program; participants in the modified program will receive brief individual sessions instead of attending group meetings when they are not meeting their weekly weight loss goals.

TESTING DIFFERENT DIETARY PRESCRIPTIONS

Another trial is examining the effect of limiting snack foods (“junk foods”) that are usually high in fat and calories, with few nutrients. A diet that has many different types of these foods is also usually high in calories and fat, which makes it hard to lose weight. In the *Healthy Habits* study, participants are randomly assigned either to an 18-month standard program or to a program in which they are instructed to specifically limit the number of different snack foods they consume to two, as a way of helping them stay within their overall calorie and fat prescriptions.

STUDYING OTHER HEALTH PROBLEMS THAT MAY IMPROVE WITH WEIGHT LOSS

The WCDRC has been involved in several other studies examining the health benefits of modest weight losses. For example, overweight women often have trouble with urinary incontinence. We have shown that modest weight losses of 5-10% can improve this problem. Recently, considerable attention has been focused on liver problems, including **non-alcoholic steatohepatitis (NASH)**, that can occur with obesity. We have demonstrated that modest weight losses can improve these problems.

A new research area at the Center involves the impact of weight loss on migraine headache frequency and severity. Recent population-based studies indicate that individuals with migraine who are also obese may be at elevated risk for more frequent and disabling headaches. To date, no studies have examined whether weight loss may contribute to reduction in headache activity among overweight and obese migraineurs.

Finally, men who are overweight and/or sedentary have been found to have an increased risk of problems with erections. The WCDRC is planning a trial to determine whether weight control can improve health and quality of life.

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