

Science Review: Weight Loss Maintenance

Introduction

Maintaining weight loss is important for the management of many of the complications of obesity, including reductions in blood pressure, glucose, and insulin concentrations, and may reduce the risk of diabetes and all-cause mortality.^{1,2} Due to adaptive physiological changes that occur following weight loss, as well as the need for continued implementation of positive diet and lifestyle changes, maintaining long-term weight loss can be a challenge, and the odds of weight regain are very high. Significant research efforts have focused on strategies that would promote weight-loss maintenance. Expert Working Groups have made specific evidence-based recommendations to support the clinical management of body weight maintenance.³⁻⁵

Research Highlights

- Data from the National Weight Control Registry has shown that increase in leisure-time physical activity, limiting television viewing time, practicing dietary restraint, self-weighing, and monitoring practices including other dietary changes are associated with weight maintenance success.⁶⁻⁹
- Expert Working Groups agree that meeting with healthcare practitioners is important for weight maintenance and that formal weight maintenance programs should be set up with follow-up for at least 1 year,^{4,10,11} and these programs should focus on behavior change⁴ and continued physical activity of at least 200-300 minutes per week,^{4,5,10} as well as individualized dietary work with emphasis on maintaining appropriate caloric intake and inclusion of meal replacements (MRs) as an option.⁴

Mechanisms of action of weight regain

Weight regain is defined as “increase in weight after initially successful weight loss.” Evidence suggests that compensatory physiological adaptations to weight loss favor weight regain, such as:

- Alterations in levels of circulating hormones: Perturbation in key appetite-related hormones following weight loss promotes weight regain by decreasing appetite and increasing hunger level.¹² One study demonstrated that, following a 10-week weight-loss diet, these hormonal changes can persist long-term (~1 year).¹³
- Reductions in energy expenditure: Total energy expenditure (TEE) following weight loss is reduced partly due to a reduced body mass and enhanced metabolic efficiency.¹⁴ Furthermore, resting energy expenditure (REE)—the minimum energy needed to maintain vital physiological functions such as heartbeat and breathing, which accounts for roughly > 60% of TEE—drops disproportionately following weight loss, thus significantly reducing the efficacy of the original weight-loss regimen.¹⁵

Challenge of maintaining long-term weight loss

In one large population study using primary care electronic health records from family practices in the UK, the odds of achieving a 5% weight loss within 1 year for individuals with Class I Obesity (BMI 30-34.9 kg/m²) were 1 in 12 men and 1 in 10 women.¹⁶ In a population-based survey in the US, only 1 in 6 overweight and obese adults reported ever having maintained weight loss of at least 10% for 1 year.¹⁷

Expert Working Group recommendations

Several Expert Working Groups have made specific evidence-based recommendations to support the clinical management of body weight maintenance.³⁻⁵ (Table 1)

Table 1. Expert Working Group recommendations for weight maintenance support

| Program structure | |
|-----------------------|--|
| AHA/ACC/TOS* 2013 | <ul style="list-style-type: none"> • Individuals who have lost weight should be advised to participate long-term (1 year) in a comprehensive weight-loss maintenance program. • Face-to-face or telephone-delivered weight-loss maintenance programs that provide regular contact (monthly or more frequently) with a trained interventionist who helps participants engage in high levels of physical activity (i.e., 200-300 min./week), monitor body weight regularly (i.e., weekly or more frequently), and consume a reduced-calorie diet (needed to maintain lower body weight). |
| Dietary intervention | |
| AND* (2016) | <ul style="list-style-type: none"> • Recommend portion control and MRs or structured meal plans as part of a comprehensive program. • Individualize the meal pattern to distribute calories at meals and snacks throughout the day, including breakfast. • Prescribe an individualized diet (including patient preference and health status) to maintain nutrient adequacy and reduce caloric intake for maintaining a lower body weight. • Advise overweight and obese adults that as long as the target reduction in calorie level is achieved, many different dietary approaches are effective. |
| Physical activity | |
| ACSM* (2009) | <ul style="list-style-type: none"> • Some studies support the value of 200 to 300 min./week of physical activity, and more physical activity may be necessary to prevent weight regain after weight loss. |
| Behavior modification | |
| AND* (2016) | <ul style="list-style-type: none"> • The following behavior strategies can be considered: cognitive restructuring, contingency management, relapse prevention techniques, slowing the rate of eating, social support, stress management, stimulus control, and cue reduction. |

*AHA/ACC/TOS: American Heart Association/American College of Cardiology/The Obesity Society; AND: Academy of Nutrition and Dietetics; ACSM: American College of Sports Medicine

Clinical evidence supporting long-term weight maintenance

Attendance at sessions

- In the 2-year “Keep It Off” randomized controlled trial, sustained supportive phone- and mail-based intervention was shown to have improved weight maintenance compared with brief intervention alone.¹⁸
- In the Look AHEAD study (a randomized trial in which 5,145 adults with overweight/obesity were assigned to an intensive lifestyle intervention or a usual care group), frequent attendance of treatment sessions was associated with long-term success.¹⁹

Self-monitoring body weight

A review of recent scientific literature found that daily self-weighing may be effective in producing weight loss and weight-loss maintenance.²⁰ Daily self-weighing may enhance weight control in the following ways:²⁰

1. Viewing graph over time provides feedback directly to the individual that can help guide choices on food intake and exercise.
2. The scale may act as a negative or positive reinforcement for behaviors causing gain or loss in body weight.
3. The act of weighing may act as a priming stimuli, sensitizing the individual to the environment that may cause eating. Additionally, early recognition by both the patient and the practitioner that weight loss or maintenance is veering off the optimal trajectory permits early intervention.

Use of meal replacements

In a meta-analysis (20 studies; n=3,017 participants) that evaluated the effects of different weight-loss maintenance approaches after an initial low-calorie diet (LCD), use of MRs was seen to have significant benefit for longer-term (> 12 months) weight-loss maintenance: Compared with control (LCD), extended use of MRs improved weight-loss maintenance by 3.9 kg (95% CI: 2.8 – 5.5 kg; p < 0.001).²¹

Self-monitoring of diet and lifestyle

Greater compliance with completion of self-monitoring logs to record daily food and beverage consumption was associated with higher weight-loss maintenance success during a 12-month weight-maintenance study following weight loss.²²

Strategies from the National Weight Control Registry (NWCR)

NWCR, a US-based database founded in 1993, provides insights into the relationship between different variables and long-term weight maintenance, helping to identify the lifestyle modification practices of individuals who have successfully lost weight. Factors identified with weight-maintenance success include:

- Increase in leisure-time physical activity⁷
- Limited TV viewing time (< 10 hours per week)⁶
- Dietary restraint⁷
- Frequency of self-weighing^{6,7,9}
- Eating breakfast⁹
- Self-limiting of sugar-sweetened beverages to limit total energy intake^{8,9}

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