

Very Low-calorie Diets

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WIN Weight-control Information Network

What is a very low-calorie diet?

A very low-calorie diet (VLCD) is a doctor-supervised diet that typically uses commercially prepared formulas to promote rapid weight loss in patients who are obese. These formulas, usually liquid shakes or bars, replace all food intake for several weeks or months. VLCD formulas need to contain appropriate levels of vitamins and micronutrients to ensure that patients meet their nutritional requirements. Some physicians also prescribe VLCDs made up almost entirely of lean protein foods, such as fish and chicken. People on a VLCD consume about 800 calories per day or less.

VLCD formulas are not the same as the meal replacements you can find at grocery stores or pharmacies, which are meant to substitute for one or two meals a day. Over-the-counter meal replacements such as bars, entrees, or shakes should account for only part of one's daily calories.

When used under proper medical supervision, VLCDs may produce significant short-term weight loss in patients who are moderately to extremely obese. VLCDs should be part of comprehensive weight-loss treatment programs that include behavioral therapy, nutrition counseling, physical activity, and/or drug treatment.

Who should use a VLCD?

VLCDs are designed to produce rapid weight loss at the start of a weight-loss program in patients with a body mass index (BMI) greater than 30 and significant comorbidities. BMI correlates significantly with total body fat content. It is calculated by dividing a person's weight in pounds by height in inches squared and multiplied by 703.

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Use of VLCDs in patients with a BMI of 27 to 30 should be reserved for those who have medical conditions due to overweight, such as high blood pressure. In fact, all candidates for VLCDs undergo a thorough examination by their health care provider to make sure the diet will not worsen preexisting medical conditions. Lastly, these diets are not appropriate for children or adolescents, except in specialized treatment programs.

Very little information exists regarding the use of VLCDs in older adults. Because adults over age 50 already experience depletion of lean body mass, use of a VLCD may not be warranted. Also, people over 50 may not tolerate the side effects associated with VLCDs because of preexisting medical conditions or the need for other medicines. Doctors must evaluate on a case-by-case basis the potential risks and benefits of rapid weight loss in older adults, as well as in patients who have significant medical problems or are on medications. Furthermore, doctors must monitor all VLCD patients regularly—ideally every 2 weeks in the initial period of rapid weight loss—to be sure patients are not experiencing serious side effects.

Health Benefits of a VLCD

A VLCD may allow a patient who is moderately to extremely obese to lose about 3 to 5 pounds per week, for an average total weight loss of 44 pounds over 12 weeks. Such a weight loss can rapidly improve obesity-related medical conditions, including diabetes, high blood pressure, and high cholesterol.

The rapid weight loss experienced by most people on a VLCD can be very motivating. Patients who participate in a VLCD program that includes lifestyle treatment typically lose about 15 to 25 percent of their initial weight

during the first 3 to 6 months. They may maintain a 5-percent weight loss after 4 years if they adopt a healthy eating plan and physical activity habits.

Adverse Effects of a VLCD

Many patients on a VLCD for 4 to 16 weeks report minor side effects such as fatigue, constipation, nausea, or diarrhea. These conditions usually improve within a few weeks and rarely prevent patients from completing the program. The most common serious side effect is gallstone formation. Gallstones, which often develop in people who are obese, especially women, are even more common during rapid weight loss. Research indicates that rapid weight loss may increase cholesterol levels in the gallbladder and decrease its ability to contract and expel bile. Some medicines can prevent gallstone formation during rapid weight loss. Your health care provider can determine if these medicines are appropriate for you.

Maintaining Weight Loss

Studies show that the long-term results of VLCDs vary widely, but weight regain is common. Combining a VLCD with behavior therapy, physical activity, and active follow-up treatment may help increase weight loss and prevent weight regain.

In addition, VLCDs may be no more effective than less severe dietary restrictions in the long run. Studies have shown that following a diet of approximately 800 to 1,000 calories produces weight loss similar to that seen with VLCDs. This is probably due to participants' better compliance with a less restrictive diet.

For most people who are obese, their condition is long-term and requires a lifetime of attention even after formal weight-loss

treatment ends. Therefore, health care providers should encourage patients who are obese to commit to permanent changes of healthier eating, regular physical activity, and an improved outlook about food.

Endnote: This fact sheet is an updated, modified version of a previously published review article appearing in the August 25, 1993 issue of the Journal of the American Medical Association. Both the review article and this fact sheet were developed with the advice of the Clinical Obesity Research Panel, formerly known as the National Task Force on Prevention and Treatment of Obesity.

Additional Reading

Active at Any Size. Revised October 2006.

Better Health and You: Tips for Adults. Part of the series *Healthy Eating and Physical Activity Across Your Lifespan.* Revised March 2006.

Dieting and Gallstones. Revised July 2008.

Weight Cycling. Revised May 2008.

Weight Loss for Life. Revised July 2006.

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1 WIN Way
Bethesda, MD 20892-3665
Phone:
(202) 828-1025
Toll-free number:
1-877-946-4627
FAX: (202) 828-1028
Email:
WIN@info.niddk.nih.gov
Internet:
<http://www.win.niddk.nih.gov>

The Weight-control Information Network (WIN) is a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) of the National Institutes of Health, which is the Federal Government's lead agency responsible for biomedical research on nutrition and obesity. Authorized by Congress (Public Law 103-43), WIN provides the general public, health professionals, the media, and Congress with up-to-date, science-based health information on weight control, obesity, physical activity, and related nutritional issues.

Publications produced by WIN are reviewed by both NIDDK scientists and outside experts. This publication was also reviewed by Rena Wing, Ph.D., Professor of Psychiatry and Human Behavior, Brown University.

This fact sheet is also available at <http://www.win.niddk.nih.gov>.