The Obesity Epidemic: Characteristics of Successful Weight Management Programs and Colorado's Approach

Michele Singer
Utah State University

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THE OBESITY EPIDEMIC: CHARACTERISTICS OF SUCCESSFUL WEIGHT
MANAGEMENT PROGRAMS AND COLORADO’S APPROACH

by

Michele Singer

A thesis submitted in partial fulfillment of the requirement for the degree

of

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in

Nutrition and Food Sciences

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

2002
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ABSTRACT

THE OBESITY EPIDEMIC: CHARACTERISTICS OF SUCCESSFUL WEIGHT MANAGEMENT PROGRAMS AND COLORADO'S APPROACH

by

Michele Singer, Master of Dietetic Administration

Utah State University, 2002

Major Professor: Noreen B. Schvaneveldt MS, RD, CD
Department: Nutrition and Food Sciences

Obesity is rapidly growing in the United States with no sign of decreasing with current treatment options available to Americans (1). There are many treatments for obesity, but few are effective. The State of Colorado has numerous community nutrition programs available to its residents ranging from government programs such as universities and state health departments to healthcare providers and volunteer organizations such as the American Heart Association. Current treatments that are available for overweight and obese individuals include commercial programs, popular diet books, Internet programs, and individualized counseling. This paper will discuss different treatments and their efficacy, successful weight loss maintenance, and a proposed method to reduce the rapidly growing rate of obesity. (81 pages)
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The rate of obesity in the United States is growing rapidly. Between 1976 and 1994, the incidence of obesity increased more than 50 percent—from 14.5 percent of the adult population to 22.5 percent (1). This breaks down by age group to approximately 25 percent of U.S. adult females and 20 percent of U.S. adult males are obese. Obesity has doubled from approximately 15 percent in 1980 to an estimated 27 percent in 1999. The current interventions available for weight loss such as popular diet books, supplements, meal replacements, individualized counseling and Internet information are not helping to decrease the obesity epidemic. The Public Health Initiative, Healthy People 2010, set an objective for the year 2010 to reduce the amount of obese Americans to 15 percent (1). This literature review analyzes the efficacy of current treatments of obesity.
CHAPTER II

OBESITY EPIDEMIC

Obesity comes from the Greek expression: ob-edere, which means overeating and is defined as excess body fat relative to weight (2). Excess body fat is determined among obesity research by body mass index (BMI). BMI is expressed by body weight in kilograms divided by height in meters squared. A BMI greater than or equal to 30 is considered obese and a BMI of 25 through 29.9 is considered overweight.

Table I. Classification of Overweight and Obesity by BMI

<table>
<thead>
<tr>
<th>BMI kg/m²</th>
<th>Obesity Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
</tr>
<tr>
<td>Normal</td>
<td>18.5-24.9</td>
</tr>
<tr>
<td>Overweight</td>
<td>25-29.9</td>
</tr>
<tr>
<td>Obesity</td>
<td>30-34.9</td>
</tr>
<tr>
<td></td>
<td>Class I</td>
</tr>
<tr>
<td></td>
<td>35-39.9</td>
</tr>
<tr>
<td></td>
<td>Class II</td>
</tr>
<tr>
<td>Extreme Obesity</td>
<td>≥40</td>
</tr>
<tr>
<td></td>
<td>Class III</td>
</tr>
</tbody>
</table>

National Institutes of Health (3)
The prevalence of obesity is rising in the United States. The 1999 National Health and Nutrition Examination Survey (NHANES) indicates that an estimated 61 percent of American adults are either overweight or obese. This is a concern to the community due to increased health risk, economic cost, morbidity and mortality.

Obesity is the second leading cause of preventable death in the United States (4). Many health risks have been associated with obesity including hypertension, diabetes, heart disease, stroke, hyperlipidemia, gout, arthritis, sleep apnea, and depression.

Obesity increases healthcare costs due to increased risk of developing chronic disease. Obesity may increase physician visits, costs of medication, hospital visits, and methods of treatment. Direct and indirect economic costs also increase with the incidence of obesity (5). Direct costs include preventive, diagnostic, and treatment services such as physician visits, medications, and hospital care. Indirect costs associated with obesity include wages lost by people unable to work because of illness or disability, and loss of future earning from premature deaths. A 1995 study conducted at the University of Virginia Health Systems estimated that the economic impact of obesity in the United States amounted to $99.2
billion dollars annually (5). Approximately $51.64 billion of those costs were direct medical costs. The direct cost associated with obesity in this study represented 5.7 percent of the national expenditure in the United States. In the year 2000, the economic cost increased to $117.73 billion per year with more than half of that from direct medical cost (5).

According to the American Obesity Association, obesity claims 300,000 lives annually in the United States (6). The American Cancer Society studied mortality in regards to obesity and found that men and women with a BMI of 30 or greater had roughly 50 to 100 percent higher mortality than people with a BMI below 25 (7). Mortality of people with a BMI between 25 and 30 was increased by about 10 to 25 percent compared to people with a BMI below 25 (6,7).
CURRENT TREATMENTS FOR WEIGHT LOSS

Americans want to lose weight. According to self-reported data conducted by the Center for Disease Control Behavioral Risk Factor Surveillance System (BRFSS), only 20.1 percent of overweight participants and 13.5 percent of obese participants stated that they were not trying to lose or maintain their weight (8). Those desiring to lose weight want to improve their body image, social acceptance and improve quality of life. However, most people who are trying to lose weight do not use the recommended combination of reducing caloric intake and increasing physical activity. Over 70 percent reported using the following strategies once in four years: increased activity (82.2 percent), decreased fat intake (78.7 percent), reduced food amount (78.2 percent) and reduced calories (73.2 percent). The BRFSS is an ongoing telephone survey conducted in all states. Telephone interviewers ask Americans questions on physical activity, weight control, and diet (8). In 2000, Colorado rated higher than the national average for positive responses to questions such as eating fewer calories and fat in addition to using physical activity to lose weight or keep from gaining
weight. Colorado's averages are higher than the nationwide average, all averages are low considering the rate of obesity in the United States. In the table below these averages are noted.

Table II: Comparison of Nationwide Average vs. Colorado Average for Positive Responses in BRFSS Survey

<table>
<thead>
<tr>
<th></th>
<th>National Average Of Positive Responses</th>
<th>Colorado Average Of Positive Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating Fewer Calories</td>
<td>13.5%</td>
<td>14%</td>
</tr>
<tr>
<td>Eating Less Fat</td>
<td>27.4%</td>
<td>29%</td>
</tr>
<tr>
<td>Using Physical Activity For</td>
<td>60.7%</td>
<td>63.9%</td>
</tr>
<tr>
<td>Losing Or Maintaining Weight</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In 1992, Americans spent $33 billion on weight loss products and services (9). There are many treatments for overweight and obese individuals to choose, ranging from supplements to counseling. The weight management method chosen by the healthcare provider or by the patient will vary depending on the level of obesity, health condition, and the individual's motivation to lose weight. Many treatment options are used in conjunction with another treatment for a weight loss program. The following treatments for obesity will be discussed in this paper:
commercial programs, meal replacements, supplements, popular diet books, Internet programs, and individual counseling. These current treatments for weight loss have not reduced the rising numbers of obese Americans.
COMMERCIAL PROGRAMS

Commercial programs include Jenny Craig, Weight Watchers, and Nutrisystem, and self-help programs such as Overeaters Anonymous and Take Off Pounds Sensibly (TOPS). Commercial programs are up-to-date on scientific information. For example, the points system for Weight Watchers labels food point level from fiber and fat based on scientific research that a diet high in fiber and low in fat is effective for weight loss. Behavioral treatments are typically delivered in a group treatment setting with eight to twelve participants. The behavior modification treatments include group support, individualized counseling, or a self-help model. Most programs consist of weekly classes or meetings that last an average of 16 to 24 weeks for 60-90 minutes each session (10). Many programs include the use of food diaries for participant self-monitoring of food intake. The programs are usually taught by a successful weight loss participant of the program and not by professionals trained in the area of weight management.

The diets in the commercial programs reviewed are considered low calorie and try to reduce calories by 500-
1000 kcal/day (10). Some programs use a formal food plan, while others include pre-prepared foods, or no food plan (10). The programs typically produce a weight reduction of 1-2 pounds per week. The weight loss variability between participants can be large, with some participants not losing any weight while others lose more than two pounds per week. A four-week study on Weight Watchers and a self-help program studied short-term effects on weight loss, eating behaviors and mood. The results showed that Weight Watchers was better in all areas compared to the self-help program. The weight loss was 1.8 kg/4 weeks for Weight Watchers and .77 kg for the self-help program (11).

The table below compares the concept, diet, cost and efficacy of Weight Watchers, Jenny Craig, Take Off Pounds Sensibly, Overeaters Anonymous, and Nutrisystem.
Table III. Comparison of Commercial Weight Loss Programs by Concept, Type of Diet, and Cost. (11)

<table>
<thead>
<tr>
<th>Weight Watchers (1963)</th>
<th>Concept</th>
<th>Type of Diet</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Track points</td>
<td>Point system: 1200-2200kcal/day</td>
<td>$15 registration</td>
</tr>
<tr>
<td></td>
<td>Group support</td>
<td></td>
<td>$9.95 weekly</td>
</tr>
<tr>
<td>Jenny Craig</td>
<td>In-center or phone: 20-min one-on-one support.</td>
<td>60% carbohydrate 20% protein 20% fat 1200-2200kcal/day</td>
<td>Start-up: $200-370 Pre-prepared meals: $65 per week</td>
</tr>
<tr>
<td></td>
<td>Pre-prepared foods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOPS (1948)</td>
<td>Support groups</td>
<td>Based on diabetic exchanges</td>
<td>$20 per year</td>
</tr>
<tr>
<td>Overeaters Anonymous (1960)</td>
<td>Patterned after 12 steps of Alcoholics Anonymous</td>
<td>No official diet</td>
<td>Donations encouraged</td>
</tr>
<tr>
<td>Nutrisystem (1990)</td>
<td>Online weight management</td>
<td>60% carbohydrate 20% protein 20% fat</td>
<td>$50 per week</td>
</tr>
</tbody>
</table>
MEAL REPLACEMENTS

Meal replacements typically replace one to two meals each day as the strategy to decrease calories and promote weight loss. The advantage for meal replacements is that menu planning is not needed which can help to reduce calorie intake. Slimfast is a popular meal replacement. The use of Slimfast was examined in a five-year study conducted in Wisconsin (13). The self-managed meal replacement group went on a three-month active weight loss phase where they consumed two Slimfast beverages per day with weekly weigh-ins and then used the meal replacement if weight gain occurred. After five years, the control group showed a weight gain of 6.7 ± 10.2 kg for males and 6.5 ±10.7 kg in females. The group that replaced one meal a day with Slimfast showed a weight loss of -5.8 ±5.4 kg for males and -4.2±.9 kg for females. Slimfast is a product available in many local stores as an over-the-counter product and does not include behavior therapy or healthy lifestyle education (12). Another study in Germany was conducted using two different caloric levels (13). Group A with an energy-restricted diet of 1200 to 1500 kcal/day and Group B was prescribed a isocaloric diet in which two of the three meals were replaced with a liquid meal replacement.
(Slimfast). After three months both groups had the same caloric reduction and used meal replacements one time per day. During the three month weight-loss period the Group A participants lost 1.5 pounds ± .4 pounds, and Group B lost 7.8 pounds ± .5 pounds. After four years, Group A weight lost 3.3 pounds ± .8 pounds, and Group B weight lost 8.4 pounds ± .8 pounds (13). This study shows that meal replacements produce more weight loss during the initial three months and long-term (four years) as compared to a low calorie diet of 1200-1500 kcal/day.
Supplements

Supplements are often tailored as the “miracle cure” many people are looking for. Typically, the “miracle cure” is the over-the-counter supplement that a person will use to lose weight. Often this approach is used while not watching calorie intake or engaging in any physical activity. Over-the-counter drugs are marketed and tailored to attract the person trying to lose weight quickly and without effort. Over-the-counter drugs that claim weight loss benefits include the ingredients caffeine and ephedrine, green tea catechins, chitosan, chromium picolinate, conjugated linoleic acid, or garcinia cambogia. All of these substances have been studied in poorly designed trials that lacked randomization, blinding, or control groups (14). Allison et al found that there is insufficient data to prove that these substances are safe or that they are efficient in promoting weight loss (14). The Food and Drug Administration (FDA) has not approved these supplements, and adverse effects have been reported from arrhythmias, increased blood pressure and even death (14). These weight loss medications are not currently reviewed with the same regulations as prescription medications. The FDA will only
review a supplement if it is shown to present "a significant risk" (15). Producers of a supplement cannot advertise that the product is a treatment of the disease but can claim that it can reduce the risk of disease (15). The National Heart, Lung, and Blood Institute (NHLBI) guidelines do not recommend any use of herbal over-the-counter supplements to be used for weight loss (16). This is due to the insufficient research and testing done and the potential side effects these products may have.

The most widely used supplements are products that contain ephedra alkaloids (Ma Haung). This supplement claims to work by increasing energy expenditure. Supplements containing ephedra and caffeine have shown efficacy and weight loss in short-term studies (six months or less) (10). Ephedra is typically used for mild asthma relief or upper respiratory symptoms. In combination with caffeine, controlled trials have shown greater weight loss than a placebo (10).

Green tea catechins are prepared from green tea leaves. The leaves of camelia sinensis are heated or steamed to create green tea leaves. The catechins are a family of compounds, which include epigallocatechin gallate (EGCG) (10). EGCG is considered to be the most potent antioxidant in the family and appears to be able to enhance
sympathetic nervous system activity at the level of the fat-cell andrenoreceptor. In a recent study subjects were given green tea extract capsules containing a total amount of 150 mg caffeine and 375 mg of EGCG (10). The subjects spent three 24-hour periods in an energy chamber where they received a placebo or the EGCG capsules. Energy expenditure was elevated by 4.5 percent in the green tea group versus 3.2 percent in the placebo group (17). Caffeine occurs naturally in green tea and it has been difficult to separate out the effects of green tea or the caffeine.

Chitosan comes from the exoskeletons of crustaceans. This supplement binds to intestinal lipids working as a “fat blocker” (18,19). Two studies evaluated its effectiveness. One trial included 51 obese women who were treated with 1200-1600 mg of chitosan for eight weeks and experienced no weight loss (18). The second trial was on 34 overweight men and women treated for 28 days and there was not any greater weight reduction in the chitosan group compared to the control (19).

Chromium picolinate works by enhancing the effectiveness of insulin. In a study of 43 overweight females using 400 micrograms per day (mcg/d) of chromium, there was weight gain unless the subjects engaged in
physical activity, which lowered weight and insulin response to glucose (20).

Garcina cambogia or hydroxycitric acid (HCA) is extracted from the rind of a brindall berry. It inhibits citrate lipase, an enzyme that catalyzes the first step in the fatty acid synthesis outside the mitochondrion (10). In a study to evaluate the effectiveness of HCA on obese subjects, there was no significant difference in weight loss observed in the group given 1500 mg HCA/day (21).

Studies mentioned above utilizing these over-the-counter products did not incorporate any behavioral therapy. The supplements were taken for a period of time while no education was given or changes were made in lifestyle.
Popular Diet Books

Many popular diets are tailored to the overweight population for rapid weight loss. During a search of an online bookstore, www.amazon.com, 1214 matches were linked to the key word 'weight loss'. Almost 60 percent of the top selling diet books were published in 1999 or 2000 (10). The diet is usually based on a concept that sounds scientific and linked to some form of research, but is not backed up by scientific data nor proven effective. Most of these diets are restrictive in one or more macronutrients, limited in food choices, and hypocaloric. The majority of these diets may produce a weight loss but do not promote healthy lifestyle or behavioral changes. Many people tend to gain back the weight they lost when they return to eating their "normal" diet. A few of these popular diets are the Atkins diet, The Zone diet, Eat Right for Your Type, Volumetrics, the Glucose Revolution, Ornish diet, and Sugar Busters diet.

The Atkins diet is based on the concept that carbohydrates stimulate insulin secretion, which in turn stimulates appetite. Dr. Atkins, MD believes that carbohydrates make you feel hungry and that restricting carbohydrates in the diet produces a state of "benign
dietary ketosis”. People would then lose weight more rapidly than they would on a lower fat diet. The diet is a very low carbohydrate, high-fat diet. Carbohydrates are restricted to 20 g/day in the induction phase and 40 g/day after that. A typical American diet of 2000 calories per day contains about 300 g of carbohydrates per day. In studies of high fat diets, show relatively rapid short-term weight loss due to restricted calories and water weight loss. The Atkins diet is dietary intervention only and does not focus on physical activity or behavior modification (22).

Dr. Barry Sears, Ph.D. developed the Zone Diet (23). The diet promotes 30 percent protein, 30 percent fat and 40 percent carbohydrate. The diet is based on the belief that this diet was consumed by the hunter-gatherers and will optimize health. Dr. Sears reports that too little carbohydrate would produce excessive counter-regulatory hormones and too little insulin, and too many carbohydrates will produce high levels of insulin. Data in the book come from his work with elite athletes. The book does not provide evidence of efficacy in overweight individuals. The author does specify that the book is directed to individuals to optimize health, not lose weight. This book
focuses on diet alone and does not teach any lifestyle change or behavioral modification techniques.

Dr. Peter D'Adamo, MD wrote the "Eat Right For Your Type" book (24). His background "knowledge" is based on watching his father help individuals improve health by adapting a diet to their personal biology. Dr. D'Adamo advises that different diets be consumed by people based on their blood type. The book is divided into the different blood types and goes into detail on the appropriate diet, personality traits, and adverse health effects based on the individual's blood type. Scientific evidence to support that link between blood type and diet is weak. Dr. D'Adamo does not present any scientific evidence to evaluate the validity of any claims made in his book. This book does not teach any behavioral modification techniques to promote long-term weight loss.

Dr. Barbara Rolls, Ph.D. is the author of "Volumetrics" (25). She has conducted research on satiety with food intake. The book is based on the energy density of foods. Studies show that human subjects tend to overeat diets that contain high energy density foods. High fat foods typically contain high energy density along with some high carbohydrate foods (25). The theory of this diet is that you can consume more high density food and feel as
full as you would on a smaller amount than on low energy density foods thus feeling satisfied on smaller portions, decreasing the calorie intake, and ultimately losing weight. This book does incorporate a few behavioral techniques and encourages physical activity. This diet does not restrict any foods and encourages food variety and healthy food choices. This book can be helpful to a highly motivated individual who would like to try weight management on their own since it does include lifestyle and behavioral techniques.

Jennie Brand-Miller, Ph.D. and Thomas Wolever, MD, Ph.D. wrote "Glucose Revolution" (26). The concept of the book is that a low glycemic index diet will promote weight loss, improve athletic performance, manage diabetes, and reduce the risk of heart disease. The glycemic index for a food is a concept based on the observation that different forms of carbohydrates produce varying glucose and insulin responses following ingestion. It is calculated by measuring the incremental area under the blood glucose curve following ingestion of a test food containing 50 grams carbohydrate (usually glucose or white bread), and comparing it to the area under the blood glucose curve following an equal carbohydrate intake from the reference food. All tests are conducted after an overnight fast. A
low glycemic index may be beneficial to health but there are no long-term intervention studies demonstrating that this kind of a diet will produce a sustained weight loss (10). There are problems focusing on low glycemic indexes of certain foods. For example, an oat bran muffin has a glycemic index of 60 and M&M’s chocolate peanuts have a glycemic index of 33, which may lead to an assumption that the M&M’s are a better choice than the oat bran muffin.

The Ornish diet is an extremely low fat (10 percent) vegetarian diet (27). "Dr. Dean Ornish’s Program for Reversing Heart Disease" was written by Dr. Dean Ornish MD, and is based on well designed research and clinical experience (27). The diet was developed for treatment of coronary artery disease. Studies have shown that this diet is an effective way to produce modest improvements in coronary artery disease and modest sustained weight loss. This low fat diet approach has not been tested on overweight individuals, and it may be unrealistic for most Americans to attempt such an extreme fat restriction. The focus of the book is a diet plan specifically for cardiac patients and does not have an emphasis on behavioral therapy. The diet could be used for high-risk cardiac patients but not for the average American trying to lose weight.
"Sugar Busters" has four authors: three physicians and a CEO of a Fortune 500 company. The basic concept of the book is that Americans eat too much simple sugar. The sugars raise glucose and insulin levels, producing an accumulation of fat tissue. The book also states that removing sugar from the diet will prevent heart disease, improve glucose levels, and promote sustained weight loss (28). The diet is based on increased consumption of fruits, vegetables, and whole-grain foods. The authors have not done any research to prove effectiveness of the programs. They discuss glycemic index but do not support this theory with any scientific data. Eliminating sugar from the diet is close to impossible since sugar is found in all types of food including fruit and whole grains, which the diet recommends. But, increasing fruit, vegetables and whole grains is beneficial for any person for a healthy diet. The diet plan is not conducive to long-term weight loss since it does not encourage lifestyle change or any behavior modification.
INTERNET PROGRAMS

Internet programs are available in the comfort of your own home via Internet and email. Brown Medical School researched whether a structured Internet behavioral weight loss program produced a higher initial weight loss and changes in waist circumference over other weight loss education web sites (29). The behavior therapy group lost more weight and reduced waist circumference more than the education groups. Forty-five percent of participants in the behavioral group and 23 percent of the educational group lost five percent of their initial body weight. Nutrisystem, which was listed as a commercial program until recently, has now switched to an online approach. Another example of an online weight management program on the Internet is called nutricise.com. This weight management program includes individualized emails from a registered dietitian who will advise on food intake, physical activity and give continuous support. The program costs $99 for the first three months and then is $9.95 for each month thereafter.
INDIVIDUAL COUNSELING

Individual counseling is a one-on-one approach and is used to create an individualized treatment plan. A healthcare professional such as a Registered Dietitian, Care Manager, Nurse, or Physician administers individualized counseling. Physicians are most frequently approached on weight management and can be very influential in helping the patient to find a treatment option. Many primary care physicians are not treating obesity due to many barriers including the lack of time, patient non-compliance, inadequate teaching materials, lack of counseling training, inadequate reimbursement, and low physician confidence (30). Among the physicians that do discuss weight management issues, time spent has been reported to be five minutes or less (30).

Individualized counseling can be effective in addition to group therapy to target treatment specifically to the patient’s needs. A study published by the Journal of Consulting and Clinical Psychology was conducted to determine if individualized counseling was more efficient than group behavior therapy (31). The participant’s preferred treatment was noted. The weight loss was significantly greater in the group approach compared to the
individual approach whether or not it was the participants' preferred treatment. Combining group therapy and individualized care can increase weight loss by increased support from the group setting and meeting specific needs in individualized care.
The Centers for Disease Control show that in 1991 only four of 45 participating states had obesity rates (BMI greater than or equal to 30) of 15 to 19 percent and none had rates greater than 20 percent. By the year 2000, 49 states were within the highest two categories of obesity (i.e., 27 states having 15-19 percent obesity; 22 states having a population rate of 20 percent obesity or more). Obesity was determined as a BMI of 30 or greater. Colorado was the only state that had a rate of obesity at 10-14 percent of the population. In 2000, the trends showed the prevalence of obesity based on the location of the state. The east south central region (Tennessee, Alabama, Kentucky, and Mississippi) had the highest rate of obesity at 23.05 percent and the mountain region (Colorado, Montana, Idaho, Utah, New Mexico, Arizona, and Wyoming) had the second lowest rate of obesity at 17.1 percent. The lowest rate of obesity of 16.95 percent and was in the New England region consisting of Maine, New Hampshire, Vermont, Massachusetts, Connecticut and Rhode Island (1).
The following figure illustrates obesity trends in the United States in 2000. Centers for Disease Control (CDC) (1).

Obesity* Trends Among U.S. Adults
BRFSS, 2000
(*BMI ≥ 30, or ~ 30 lbs overweight for 5'4" person)

Successful weight loss and a reduction of the obesity epidemic can be accomplished. Recent research has found various successful treatments and approaches. A few of those programs will be discussed to identify effective treatments for weight loss. The programs are National Weight Control Registry, Thin for Life, behavior modification and physical activity.

Dr. James Hill, Ph.D. of the University of Colorado and Dr. Rena Wing, Ph.D. of the University of Pittsburg founded the National Weight Control Registry (NWCR) in 1993. The NWCR is a registry of people who have been successful in weight loss. There are over 2,000 people enrolled in the registry. NWCR participants must have lost at least 30 pounds and maintained that weight for at least one year. The participants are 18 years and older. The average weight loss was 60 pounds and was kept off for five years. About 50 percent of the participants cited that they lost the weight on their own without any formal program. The registry is not a treatment plan but important information on how these participants have lost weight successfully and maintained that weight loss (42).
When the participants enroll, they fill out a questionnaire on many areas related to their weight loss and maintenance. The participants then complete a questionnaire annually. The NWCR participants have reported substantial changes in eating and physical activity to lose and maintain their weight. The average calorie consumption was 1400 kcal/day with 24 percent calories from fat and expending 400 kcal/day in physical activity. The most frequently cited form of physical activity was walking. Using this database can be very useful when trying to develop a weight management program or community based intervention.

"Thin For Life" is a book written by Anne M Fletcher, MS, RD (43). The author conducted a similar type of research as the NWCR. She interviewed 160 successful weight loss masters with a weight loss of at least 20 pounds that had been maintained for a minimum of three years. Of the 160 participants, more than half achieved a weight loss of 50 pounds or more with an average weight loss of 63 pounds.

The book, "Thin For Life", is based on ten keys to success that the author found to be successful for the 160 participants. The first component is for the individual trying to lose weight to believe that they can be thin for
life. This tool is used to change the thought process and to understand that heredity can be overcome. The second key is to take the reins. This concept is based on the need to have proper reasons for wanting to lose weight. Successful weight loss can be achieved if weight loss is for the individual and not for somebody else. The book describes that it may take several tries to be successful but with the right reasons to lose the weight, it can be achieved. The third key is to find a way to lose weight that would work best for the individual. The participants found that weight loss is achieved by finding a program that is right for them or doing it on their own.

Accepting food facts is the fourth key. This is to stop "dieting" and learn the balance and benefits of a healthy diet. Nip it in the bud is the fifth key. To break the cycle of relapse and to pay attention to weight gain so action can be taken immediately. The sixth key is to learn the art of positive self-talk. We control many of our actions based on what we tell ourselves. The seventh key is to move it or lose it. Weight loss is difficult to achieve and maintain without physical activity. Face life head on is the eighth key. This component deals with emotional eating and learning to overcome this aspect.

Getting more out of life is the ninth key. This key
reminds the individuals to have positive thoughts and to change their mindset so they are doing the things they want to do instead of the things they have to do. The final key is not to go alone. The importance of support is key to successful weight loss and maintenance.
A recent survey of the top ten reasons people overeat showed that hunger was never mentioned (44). People tend to eat for many reasons such as boredom, social cues, or environmental stimuli. Psychologists have recognized that rarely do people eat from physical hunger. Weight loss treatments not only need to focus on restriction of calories and increased energy expenditure, but also on behavioral therapy.

The primary goal of behavioral therapy is to modify eating habits and physical activity. Behavioral therapy focuses on changing behavior to restrict calorie consumption and increase energy expenditure to produce a negative energy balance. This is accomplished through education and therapy. Behavioral treatments are usually provided in group settings and can be used alone or with individual counseling, meal replacements, very-low-calorie diets, weight management medications, and gastric bypass surgery. Treatments include support networks, body image, counseling, and teaching methods to avoid emotional eating to change habits and beliefs about eating and weight loss. Behavior therapy can be cost effective to health
organizations and commercial programs since more than one person can be treated at a time.

The U.S. environment promotes food intake and reduction of energy expenditure. Most Americans spend the majority of their time at work and very few occupations require substantial amounts of physical activity. Advances in technology have greatly reduced the need for increased energy expenditure. Remote controls, pay at the pump gas stations and automatic car washes are now common. Dependence alone on automobiles has decreased the need for physical activity. People drive to work, take the elevator, sit at a computer, drive through for lunch, communicate via email, and spend the evening watching TV. Increased energy intake is also encouraged in the U.S. environment. Restaurants serve large portion sizes for an inexpensive price. There is an increase in convenience foods. Eating out and convenience foods typically tend to be higher in fat and dense in kilocalories. Behavior therapy promotes awareness of environmental issues and deals with ways to increase energy output.

Studies have compared behavioral therapy plus dietary interventions against dietary intervention alone. These studies have shown that behavior therapy, used in combination with other weight loss approaches, provides
additional benefits in assisting patients to lose weight (45). Behavioral therapy gives participants tools, education and support in order to change unhealthy lifestyle factors. Behavior therapy works on psychosocial aspects of being overweight and how to deal with these emotional aspects. Support groups are formed for added support and interaction among participants. Environmental issues are typically addressed to help participants become aware of their surroundings and learn methods to overcome environmental issues that impede achievement of their weight loss goal.

Behavioral therapy groups typically address issues of negative self-talk, depression, self-esteem and body image. Obese and overweight people tend to be discriminated against, feel depressed, and have a low self-esteem (46). Negative beliefs about obesity are often seen in discrimination of overweight and obese people. In the United States, there is a large amount of pressure to be thin and that fat is a sign of laziness and poor self-control. A study by Roe and Eichwort reported that 16 percent of employers would not employ obese individuals under any circumstance and an additional 44 percent would employ them only under special circumstances (47). Landlords have also been studied on discrimination against
overweight individuals and have been found to be less likely to rent to overweight individuals (48).

Depression may be linked to obesity. Many obese patients become upset when they look into a mirror and this poor body image can lead to many social problems and low self-esteem. Americans try to resemble what they think they should look like based on magazines and models. Behavioral therapy allows people to understand that health should be the focus not what size clothing they wear.

Behavior therapy is successful because it not only focuses on the need to reduce calorie consumption and increase physical activity, but also focuses on the need to change behaviors and attitudes on weight. Issues are addressed that many participants may have not associated with their weight problems. Tools and techniques are then given to promote change. Examples of these tools and techniques are self-monitoring, cognitive behavior techniques, and the support network that is formed between the participants and the instructor.

Self-monitoring is the observation of ones behavior through documentation. Patients record activity and daily food and beverage intake. Recording will help increase the patient’s self-awareness of personal behaviors. Other behavioral issues can also be recorded such as mood, time
Studies conducted by Boutelle and Kirschenbaum used self-monitoring with behavior therapy. The eight-week study showed that the most consistent self-monitors lost more weight than the least consistent self-monitors. In addition, regardless of the overall consistency of self-monitoring, the participants lost the most weight during their two most consistent weeks compared to their least two consistent weeks (49).

Cognitive behavior therapy techniques that have been studied include cognitive rehearsal, social pressure, and cue avoidance. Cognitive rehearsal uses positive self-talk and rewards. For example, when in a situation where food is tempting, the individual will describe thoughts and feelings based on the situation and make positive self-statements on the situation. The next step would be to follow the positive self-talk statement and choose an alternative solution. Finally, the individual will reward himself/herself for resisting the situation. The individual will then plan ahead so that this alternative is thought of and used in difficult situations. Social pressure is the group support that enables the participants to receive help from others in difficult situations. Cue avoidance is changing the environment so that when a temptation arises there are no food cues available. For example, a stressful
situation arises where the typical response would be to grab a bag of cookies, but the environment has been changed so that there are no cookies available. In the studies reviewed by the National Institutes of Health evidence report, all types of cognitive therapy were effective. Cognitive rehearsal was more effective than social pressure and less effective than cue avoidance. Another study showed no benefits of one cognitive behavior technique compared to another.

The participants in behavior modification programs typically form support networks. Support increases interaction among participants and may increase the success of weight loss efforts. If a person feels supported, accepted, and encouraged by others, stressful situations during the program may be easier to endure. Social support may directly benefit an individual's health or it may act as a support for life stresses (50).
PHYSICAL ACTIVITY

Long-term weight loss maintenance has been difficult to sustain despite the weight loss treatment that is used. A study of 100 obese patients followed two years after treatment found that two percent maintained a weight loss of at least 20 pounds. Recent studies have found that after a behavioral weight loss program only .9 percent of men and 5.3 percent of women were maintaining successful weight loss after four years. But cross-sectional data showed that 2.6 percent of men and 28.9 percent of women had maintained 100 percent of their weight loss. But each study had a different measure of what success is. Success is defined as an intentional weight loss of at least ten percent of initial body weight and maintaining this weight for at least one year (51).

Most successful weight loss is a combination of eating fewer calories and using more energy through activity (52). Physical activity is the single best predictor of long-term weight loss. Physical activity can create an energy deficiency and therefore weight loss. Dr. Thomas E. Kottke, MD from the Mayo Clinic, Rochester, Minnesota, and associates, collected data on 1224 individuals in Olmsted County, Minnesota. Of these
subjects, 65.6 percent of the men and 47.9 percent of the women reported being overweight or obese. Most men (72.6 percent) and most women (85.1 percent) said that they were trying to lose weight or maintain their weight. However, only one-third of those trying to lose weight and one-fifth of those trying not to gain weight reported combining diet with at least 150 minutes of exercise per week.

Physical activity should be maintained on a regular basis to decrease weight gain. The University of Minnesota and Brown University studied the effects of a high level of physical activity (2500 calories per week) had on long-term weight loss. Obese participants were randomly placed into two groups: a behavioral treatment group burning 1000 kcal/wk, and a high physical activity group expending 2500 kcal/wk. After 18 months, the high physical activity group was expending 2317 kcal/wk and the 1000 kcal/wk group increased to 1629 kcal/wk. The high physical activity group lost more weight at the 6-12- and 18-month intervals. The results showed that a high level of activity can be achieved by obese participants and can be beneficial for long-term weight loss (53). Another study from University of Pennsylvania examined the effects of increasing lifestyle activity on long term weight loss. The two-year
study randomized participants into three different treatment conditions. These treatment conditions included structured on-site exercise, structured at home exercise, and lifestyle activity. All groups had the same 1200-1500 calorie diet. The results showed no significant differences in weight loss. The two-year follow up will help to determine if differing types of physical activity will influence long-term success in terms of weight loss or weight gain.
CHAPTER IV.

FEDERAL GOVERNMENT PROGRAMS

The President of the United States, George W. Bush, has developed an initiative to increase personal fitness called "Healthier US". The program is based on the need for improvement of health to achieve a better and longer life and has identified four concepts to create a healthier America. These include being physically active every day, eating a nutritious diet, getting preventive screenings, and making healthy choices. The program has two actions to promote physical fitness. The first is to revitalize the President's Council on Physical Fitness and Sports by adding a new chair and new members. The council will coordinate its activities with federal, state, and private entities to serve communities across the country more effectively. The second action is the Agency-Wide Activities to Promote Personal Fitness which will allow Federal agencies to review policies, programs, and regulations related to the four concepts mentioned above (physical activity, nutrition, screenings, and making healthy choices). The agencies will then propose revisions, modifications, or new actions to improve the programs and
forward the recommendations to the President within 90 days (32).

The Weight-control Information Network (WIN) of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and National Institutes of Health (NIH) provides health professionals and consumers with science-based information on obesity, weight control, and nutrition. WIN was established in 1994 and provides publications, taped lectures, abstracts, a quarterly newsletter entitled WIN Notes, as well as another program called Sisters Together: Move More, Eat Better. This program encourages healthy weight by physical activity and a nutritious diet for black women over the age of 18 (33).

The Centers for Disease Control (CDC) is a federal agency that is recognized as the lead for protecting and promoting health and safety of people of the United States. The CDC develops and implements disease prevention and control, environmental health, and health promotion and education activities designed to improve the health of the people of the United States. Since 1946, CDC has been collecting information and working with community organizations to improve the quality of life and improve health problems. Public health programs for adults sponsored by CDC include 5-A-Day for Better Health, ACEs:
Active Community Environments, Obesity and Overweight State Programs, and Well-Integrated Screening and Evaluation for Women Across the Nation (WISEWOMAN). These programs will be discussed in detail below. There are ten CDC facilities in the United States with one located in Fort Collins, Colorado (1).

The 5-A-Day Program is a national effort to increase the amount of fruits and vegetables consumed daily to five servings. It was put into effect to achieve the Healthy People 2000 objective to increase fruits and vegetables consumed per capita. In addition, the goal of 5-A-Day is to inform Americans that eating fruits and vegetables can improve their health and may reduce the risk of cancer and other chronic diseases. Government agencies, nonprofit groups and industry are targeted to use promotion, media, national and state-based programs, research, policy, and environmental strategies to enforce the behavior change (34).

The ACEs program is an initiative to promote walking, bicycling. The goals of ACEs are to encourage the development of pedestrian and bicycle friendly environments, promote active forms of transportation like walking and bicycling, and disseminate information related to Active Community Environments (35).
The Obesity and Overweight State Programs support state health departments and their partners in developing and implementing targeted nutrition and physical activity interventions to prevent chronic diseases, especially obesity. Six states were first given funding in October 2000 to implement programs directed towards this cause. Those states were California, Connecticut, North Carolina, Massachusetts, Rhode Island, and Texas. In 2001, six additional states received the funding, including Colorado, Florida, Michigan, Montana, Pennsylvania, and Washington (36).

WISEWOMEN provides low-income, under-insured and uninsured women ages 40-64 years with chronic disease risk factor screening, lifestyle intervention, and referral services in an effort to prevent cardiovascular disease. The screening includes blood pressure checks, cholesterol testing, and education on healthier diets and increased physical activity. By the year 2001, more than 10,000 low-income women had participated in the program (37).
CHAPTER V.
COLORADO STATE PROGRAMS

Treatment of obesity should start with understanding the causes of obesity. What factors of a specific region of the United States would contribute to a higher rate of obesity? The weather, climate, cuisine, food preparation, activities, and nutrition programs can be variances in the rates. Understanding these factors could help to determine why Mississippi has the highest rate of obesity at 24.3 percent and Colorado has the lowest rate at 13.8 percent (1). In this chapter, Colorado programs are described. Government, healthcare, and volunteer organizations are reviewed to determine possible reasons why the Colorado rate of obesity is the lowest in the United States.
Colorado State Health Department

The State Health Department of Colorado recently received funding from CDC’s Obesity and Overweight State Programs. The state health department is currently working on an action plan named Colorado Physical Activity and Nutrition State Plan 2010. The plan will be based on twenty Healthy People 2010 goals and objectives. There are three objectives for general obesity, three for nutrition, two for physical activity, three for physical activity in children, and two for access (increase of walking and biking). These national goals will then be changed to specifically match Colorado’s needs, and strategies determined for achievement of the goals. There are four task force groups made up of many community organizations who will determine the strategies. Some of the organizations involved are American Heart Association, Kaiser Permanente, Beef Council, Western Dairy Council, Colorado Department of Transportation, University of Colorado Health Sciences Center, Colorado State University Extension Program, USDA, and the Colorado Department of Education. The task force groups are divided into the assessment group, the community group, the school site group and the work site group. Each task force meets
regularly to develop strategies for implementing Colorado's goals. The groups will then write specific action steps to help the related community organization to implement the strategies. For example, the work site group (ex: Xcel energy) may write a strategy to increase stair use. The action step would be to put up signs by the elevators reminding employees to use the stairs. The final implementation would be the community organizations (i.e. Kaiser Permanente) to act as a resource for groups trying to implement the strategies (i.e. Xcel) with education information or referrals needed. That way if Xcel is having problems implementing the stair use, Kaiser Permanente could come for an inservice to employees or send educational pamphlets to be distributed.

A current program that the Colorado State Health department is implementing is the 10,000 steps per day and five fruits and vegetables per day or 10K/5-A-Day program. This program is being piloted in many different areas of Colorado including two Indian reservations in Iowoac, CO for the Mountain Utes and in Ignacio, CO for the Southern Utes. Work site pilot programs were initiated at the State Health Department, Kaiser Permanente, and the Colorado Department of Transportation (CDOT). In addition to 10K/5-A-Day, Alamosa CO has implemented a one percent or less
milk campaign to decrease consumption of whole and two percent milk and increase one percent and skim milk consumption.
Cooperative Extension Program

The Cooperative Extension Program in Colorado is based in Fort Collins at Colorado State University. The Food Science and Nutrition Cooperative Extension is the liaison between the University and the community. The main objectives of the program are: to answer consumer and professional questions on nutrition and food safety, to design, develop, and implement appropriate nutrition and food safety education programs for various populations within Colorado, to assist community programs and agencies in meeting specific food safety and nutrition education goals, and to apply research-based information to design and deliver unbiased, accurate nutrition, food safety, and health programs.

"The Cooperative Extension Program is currently submitting proposals to Colorado Trust for funding to focus on weight/activity in the Northwest area [of Colorado] and diabetes in the Southeast area [of Colorado]" states Jennifer Anderson, Ph.D, R.D who is a Professor and Extension Specialist for the Department of Food Science and Human Nutrition at Colorado State University.

Some of these initiatives will include a 10,000 steps per day program called "Colorado On the Move" that is implemented by the University Of Colorado Health Sciences Center and Dr. Jim Hill, Ph.D. Cooperative Extension is now finalizing a program developed by a Ph.D. student
called "On the Move" which is directed towards obese sedentary women.

In addition to development and implementation of programs, the Cooperative Extension website at www.ext.colostate.edu is a useful source for educational materials on healthy eating and physical activity (38).
Universities have a notable influence in communities by bringing awareness and professionally directed programs. The University of Colorado Health Sciences Center (UCHSC) has two noted programs that are directed towards treatment and prevention of overweight and obesity. The programs are Centers for Obesity Research and Education (C.O.R.E) and Colorado Weigh. The C.O.R.E. mission statement is:

"In response to the need to address obesity as a major threat to the public health, the Centers for Obesity Research and Education strive to: provide timely, relevant education and training about obesity and its management to primary care physicians and other health care professionals in our communities, be an educational and informational resource in the field of obesity, nationally and in the individual communities we serve, and raise the public awareness about the problem of obesity and the risk of excess weight including options for prevention and management in fostering health improvement."

Workshops are held across the United States on a monthly basis to inform providers on the latest information on treatment and prevention of overweight and obesity. The workshops are interactive to allow healthcare providers with hands-on experience they can immediately bring back to their individual practices. Workshop topics include: review of NIH-NHLBI obesity treatment guidelines, physician/health care provider as an agent of change,
providing an empathetic environment, skill-building in effective counseling/communication techniques, patient assessment, state-of-the-art approaches to nutrition therapy and exercise, and long-term approaches to weight loss and weight maintenance including medication and surgery (39).

*Colorado Weigh, a community weight loss program, has been in existence since spring of 2001. A registered dietitian and a psychologist developed the curriculum. Some of the information was taken from a former University of Health Sciences Center program called Weight Choice.*

*Colorado Weigh is a sixteen-week program taught by a registered dietitian. Classes are held at 6 locations throughout the Denver Metropolitan area. The cost of the program is $350 for the sixteen weeks or approximately $22 per class. Participants are weighed weekly and are required to wear a pedometer to count steps. Participants are given a pedometer, a fat and calorie counter book, and a weekly food journal. The program content is pre-determined by the University of Health Sciences Center staff. The topics of the class are as follows (40):

Week 1: Getting started: contracts, introduction
Week 2: Eating for Success, food guide pyramid, calorie and fat goal, goal setting
Week 3: Food labels, behavioral contracting
Week 4: Move those muscles, time management
Week 5: Menu planning and grocery shopping
Week 6: Changing your environment
Week 7: Eating for health, chronic diseases, fiber, calcium
Week 8: Rethink negative self talk
Week 9: Jumpstart your activity plan
Week 10: Ten week assessment
Week 11: Dining out
Week 12: Emotions and weight management
Week 13: Stress management
Week 14: Special occasions
Week 15: Tips from a successful maintainer, guest speaker
Week 16: Relapse prevention

*Colorado Weigh* requires food diaries and the use of pedometers. The instructor and participant set goals on the number of steps the participant is to complete daily. Individual instructors will bring in additional information for the participants in the program depending on their background and experiences. This program emphasizes the reduction of calories and fat and the increase in energy expenditure to lose weight. The program’s eating plan is based on the food guide pyramid, the need for variety of nutrients, and decreasing portion sizes.
Kaiser Permanente is Colorado’s oldest and largest group practice Health Maintenance Organization (HMO). There are more than 321,602 members in the six-county Denver/Boulder/Longmont metropolitan area. Kaiser operates 14 full-service medical offices and leases three mental health offices. Kaiser Permanente is the only hospital/healthcare organization that offers a weight management program. The weight management program is only one of the programs offered to its members by the Prevention Department. Other programs include work site health promotion and health education.

The weight management program is a one year program that focuses on nutrition education, physical activity, and behavior modification. The program is medically supervised, and includes five one-on-one visits with a Case Manager to individualize the care to each patient. These visits include measurements (weight, bodyfat analysis, heart rate, blood pressure, and waist circumference), blood work (if necessary), depression analysis, sleep disorder questionnaire, goal setting, and overview of medical history. The patients are instructed to attend the American Heart Association’s Slim for Life and
Active for Life programs as part of the year program.
Optional care would include obesity medications and gastric bypass surgery to those that qualify.
Community Programs in the area can be valuable resources for support, education, and weight loss. In Colorado, there are many community programs available. One of these is *Slim For Life* (SFL).

*SFL* was developed by a registered dietitian in Utah in 1979. The program was then adopted by the Utah Affiliate of the American Heart Association (AHA). The Colorado affiliate began offering *Slim For Life* in the fall of 1984. The program is now offered state wide at 24 locations for the general public.

*Slim For Life* is a healthy approach to weight management and disease prevention that focuses on nutrition, physical activity, and behavior modification. Participants are taught to make a permanent lifestyle change in order to live more "heart healthy". *Slim For Life* is a ten-week program taught by a registered dietitian. The class has between 12-20 participants. Participants are not weighed at all during the ten-week program. The cost of the program is $70 or $7 per class. Food diaries are optional for the participants to complete and provided if the participant is interested. The program
content is pre-determined by the SFL committee. The topics are as follows:

Week 1: Introduction

Week 2: Stages of change, goal setting

Week 3: Eating plan, hunger scale

Week 4: Food labels

Week 5: Physical activity

Week 6: Obstacles

Week 7: Long-term success strategies

Week 8: Chronic disease and cholesterol, fiber, fat

Week 9: Recipe modification

Week 10: Summary and goals

Slim for Life developed a follow-up class called Active for Life (AFL). AFL is also a ten-week program that is taught by a certified exercise professional. The class covers stress management and physical activity. The topics are as follows:

Week 1: Introduction, background information about activity

Week 2: Benefits of physical activity, activity pyramid

Week 3: F.I.T.T formulas, activity and health

Week 4: Strength and Endurance training

Week 5: Stretching

Week 6: Eating plan, water, AHA food certification program

Week 7: Stress
Week 8: Obstacles to exercise

Week 9: Safety

Week 10: Summary and goals
COLORADO ACTION FOR HEALTHY PEOPLE

Colorado Action for Healthy People (CAHP) has been in existence since 1985 and supports health promotion and disease prevention to reduce the risk of illness and death. CAHP is a non-profit organization that has received funding from the Colorado Trust and has helped more than 150 community based projects. The objective of CAHP is to improve employees' health and fitness, reduce absenteeism, increase work performance and boost an organization's morale and productivity. CAHP has helped more than 30 communities conduct the Colorado Action for Healthy People Health Assessment process, which is a way to identify and address priority health issues in a community. The most popular project of CAHP is Coming Alive. Coming Alive is a 10-week employee health exercise challenge offered to Colorado worksites. The purpose is to promote physical activity and encourage individuals to take an active role in improving health and fitness levels to reduce risk for heart disease. Coming Alive provides help to beginners of physical activity, enforce safety, educate exercise habits, provide social support for exercise, help with weight control, and promote maintenance of regular physical activity (41).
CHAPTER VI

PROPOSED METHODS FOR SUCCESSFUL WEIGHT LOSS MANAGEMENT

Any weight loss program can be successful if the program includes calorie deficit. Weight loss will be achieved regardless of the macronutrient content as long as the calories eaten are less than the calories expended. All popular diets as well as recommended diets by government and non-government organizations as described in chapter II result in weight loss. But it is important to understand that weight loss is not the same as weight maintenance. In order to have a successful weight management program weight maintenance needs to be a priority and as described in chapter III, behavioral therapy and physical activity is essential.

Obesity is a rapidly growing epidemic in our society. A healthcare provider needs to consistently update their skills regarding current research, new treatments, and new approaches. In addition, the care provider needs to be current with new fad diets, over-the-counter medications, and supplements and discuss pros and cons of each with their clients. In addition, the treatment approach needs to be individualized to the specific patient. Using these
three components plus the addition of behavior therapy, a successful weight management program can be established.

The American Dietetic Association (ADA) has developed a position statement regarding weight management stating that successful weight management for adults requires a life-long commitment to healthful lifestyle behaviors emphasizing eating practice and daily physical activity that are sustainable and enjoyable (54). All programs should incorporate behavioral therapy, which is critical to achieve long term weight loss. Using behavioral techniques will help the patient avoid lapses and ultimately relapses.

In treating obese patients it is helpful for the practitioner to have a “tool box” that includes various treatments that can be used for weight management. Not one program or treatment will work for all patients. A care provider should work with the patient to determine what type of treatment would be appropriate. Some patients may work best with group classes while others may prefer Internet or individual care. If a patient needs structured meal plans, a meal replacement may be a good approach for them. One patient may work best with group support weekly while another patient may prefer individual counseling every other month.
Prevention should be addressed in a weight management program. If further weight gain can be prevented, health risks will be decreased. In a prevention plan, maintenance of weight should be addressed. Other treatments for obesity can be modified for use in maintenance or prevention. These include increased physical activity and a decrease in caloric intake. Individual, group, and Internet resources can be used in addition to meal replacements.

For optimal weight loss success, the above recommendations should be carried out through a weight management center with many facilities located throughout the metropolitan Denver area, funded by the government and supported by volunteers and community organizations such as American Heart Association and the American Diabetes Association.

The ideal facility would have all types of treatment options available. Interested individuals would be assessed for which specific treatments they need to support them with their weight loss efforts. The cost of the treatments would be full price, discounted or free depending on income level and treatment choice.

In this type of setting, many different healthcare providers would be on staff including doctors, dietitians,
certified personal trainers, physiologists, nurses, laboratory technicians, and case managers. All staff would be kept up to date on obesity treatments and work together to overcome the obesity epidemic.
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APPENDIX

Glycemic Index
Glycemic Index

The following formula is to measure glycemic index.

\[
\text{Glycemic Index} = \frac{\text{Blood Glucose area after test food}}{\text{Blood glucose area after Reference food}} \times 100
\]