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ABSTRACT

Nutrition is well-recognized as a necessary component of educational programs for physicians. This is to be valued in that of all factors affecting health in the United States, none is more important than nutrition. This can be argued from various perspectives, including health promotion, disease prevention, and therapeutic management. In all cases, serious consideration of nutrition related issues in the practice is seen to be one means to achieve cost-effective medical care. These modules were designed to provide more practical knowledge to health care providers, and in particular primary care physicians. This module is designed to provide information for the physician which will assist in the counseling of overweight patients, to help them achieve and maintain weight loss, and to help distinguish among all overweight persons those who specifically need to lose body fat. Included are the learning goals and objectives, self-checks of achievement with regard to goals, references for the physician and for the physician to give to the patient, and a "Guide to Changing Eating Habits" for physicians. (CW)

9 Dietary Management in Obesity

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Nutrition in Primary Care

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The Nutrition in Primary Care Series Contains These Modules:

1. Nutrient Content of Foods, Nutritional Supplements, and Food Fallacies
2. Appraisal of Nutritional Status
3. Nutrient and Drug Interactions
4. Normal Diet: Age of Dependency
5. Normal Diet: Age of Parental Control
6. Normal Diet: Adolescence
7. Normal Diet: Pregnancy and Lactation
8. Normal Diet: Geriatrics
9. Dietary Management in Obesity
10. Dietary Management in Diabetes Mellitus
11. Dietary Management in Hypertension
12. Dietary Management in Hyperlipidemia
13. Dietary Management in Gastrointestinal Diseases
14. Dietary Management for Alcoholic Patients
15. Nutritional Care of Deteriorating Patients
16. An Office Strategy for Nutrition-Related Patient Education and Compliance

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9 Dietary Management in Obesity

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9 Dietary Management in Obesity

Nutrition in Primary Care

Tables and Figures

Introduction

Obesity is one of the most common and perhaps the most vexing problem that the physician sees in daily practice.[1] In the Virginia Study,[2] obesity ranked ninth in frequency as a problem seen by family physicians. It has been estimated that 10 to 50 million persons in the United States are overweight or obese. Treatment of obesity is difficult; only one-fourth of the patients treated lose weight, many of whom regain lost weight as soon as the treatment program is discontinued.[1]

How can you distinguish among all overweight persons those who specifically need to lose body fat? How can you help patients achieve and maintain weight loss? The answers to these and other questions related to the treatment of the obese patient are included in this module.

Goals

Upon completion of this unit of study, you should be able to:

1. *Distinguish between overweight and obesity, and judge the appropriateness of a weight reduction regimen for each;*

2. *Evaluate a patient's typical diet history and develop an appropriate caloric reduction plan, taking into consideration the patient's lifestyle, socioeconomic status, activity level, and psychological factors;*

3. *Suggest a total weight reduction plan which includes recommendations for appropriate diet, exercise, and behavior modification techniques; and*

4. *Answer patients' questions concerning weight-reduction group programs, such as Weight Watchers, and the merits and drawbacks of fad diets.*

What Is Obesity?

Obesity is an excessive accumulation of adipose tissue. Diagnosis can be made by observation, clinical judgment, and history. Practical methods of diagnosis include the use of height/weight tables and skinfold measurements.

Obesity can be defined as an excess of body fat causing body weight to be more than 20% above desirable values. In clinical practice, obesity is often used erroneously and interchangeably with "overweight," which is defined as weight over a given standard; the standard is usually given in relation to height. The most widely used tables of "desirable weight" are provided by the Metropolitan Life Insurance Company. Desirable weight is defined as that weight at which the lowest mortality rate occurred among individuals taking out life insurance policies. The Fogarty modification of their table shown in Table 9–1 is a frequently and easily used measure of desirable body weight for various heights in men and women.

The degree of overweightness can be expressed in several ways. One method is to calculate the percentage of actual weight to "desirable" weight using Table 9–1. For example, a 5 feet 5 inches tall woman who weighs 140 pounds has a "desirable" weight of 123 pounds (see Table 9–1) and is 114% of her "desirable" weight (140/123 × 100). Weight

Table 9–1 Guidelines for Body Weight

Height*		MEN Weight (lb)*			WOMEN Weight (lb)*		
Ft	in	Average	Acceptable weight		Average	Acceptable weight	
4	10				102	92	119
4	11				104	94	122
5	0				107	96	125
5	1				110	99	128
5	2	123	112	141	113	102	131
5	3	127	115	144	116	105	134
5	4	130	118	148	120	108	138
5	5	133	121	152	123	111	142
5	6	136	124	156	128	114	146
5	7	140	128	161	132	118	150
5	8	145	132	166	136	122	154
5	9	149	136	170	140	126	158
5	10	153	140	174	144	130	163
5	11	158	144	179	148	134	168
6	0	162	148	184	152	138	173
6	1	166	152	189			
6	2	171	156	194			
6	3	176	160	199			
6	4	181	164	204			

*Height without shoes, weight without clothes

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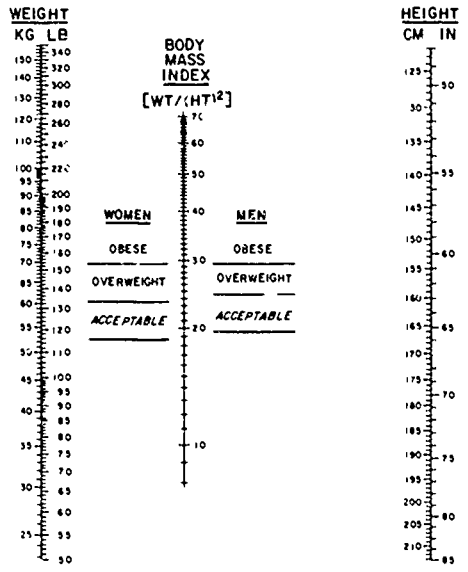
Figure 9–1 A Nomogram for Body Mass Index



*To use this nomogram, place a ruler or other straightedge between the body weight in kilograms or pounds (without clothes) located on the left-hand line and the height in centimeters or in inches (without shoes) located on the right-hand line. The body mass index is read from the middle of the scale and is in metric units.

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and height can also be related by various ratios such as the body mass index weight/(height)^2, which is well correlated with body fat. A nomogram for obtaining body mass index using height and weight is shown in Figure 9–1.

The most widely used and practical criterion for measuring obesity is the skinfold thickness measurement. Measurements of skinfold thickness from four separate sites — biceps, triceps, subscapular, and suprailiac areas — provide a reliable estimate of body fatness. Module 2 on appraisal of nutritional status contains information on the correct procedure for measuring skinfold thickness.

In the Ten State Nutrition Survey, obesity in adults was defined as skinfold measurements greater than the 85th percentile of measurements for young adult white males (>18.6 millimeters) and young adult white females (>25.1 millimeters). The subscapular skinfold thickness of women and the circumference at the waist of men appear to be the best measuring sites for determining who is overweight and, of those, who is obese. Measurements of body density (weight of the body in and out of water) and isotope dilution techniques (body water, ^{40}K cell mass, and fat mass) provide the most accurate measurements of body fat but are not practical for routine use.

In addition to clinical judgment and anthropometric measurements for determining overweight and obesity, eliciting and evaluating a patient's diet history and other relevant information can alert you to the beginning of an undesirable weight trend. Additional history information should include recent changes in weight, diet, activity level, and behavior; changes in body weight over the past year; and the presence of psychosocial problems. Answers to these questions will give you appropriate information upon which discussion of weight control can be based.

Who Are the Obese?

Age, sex, genetics, socioeconomic conditions, and physical activity affect the degree of body fat. The incidence of obesity is higher in low socioeconomic levels and a sedentary lifestyle is associated with obesity among Americans. Obesity is more frequent among women than among men.

Age, sex, genetics, socioeconomic conditions, and level of physical activity affect the amount of body fat a person possesses. At birth, the human body contains approximately 12% fat, which by age six months increases to 30% and then declines to 18% by the age of ten. Females at the age of puberty show an increase in body fat, whereas males decrease body fat at this same age. By age 18, females have approximately 20 to 25% body fat and males have approximately 15% to 18%, the percentages frequently rise in both sexes to 30% to 40% during adulthood.

Socioeconomic conditions clearly play a role in the development of obesity. Racial differences may also occur but are often difficult to separate from environmental and socioeconomic factors. Obesity is more common in women than men, in

black women than in white women, in white men than in black men, and in those of lower socioeconomic status than in those of higher socioeconomic status.[3] According to the 1979 Build and Blood Pressure Study of the Association of Life Insurance Medical Directors and the Society of Actuaries, the average American man has become heavier during the past 20 years and the average American woman has become lighter.[4]

Obesity — What Causes It?

Excess body fat occurs when the amount of ingested kilocalories is higher than the kilocalories expended. The constancy of body weight in humans suggests that the body regulates its storage of kilocalories within narrow limits. Yet the regulatory mechanisms, if they exist, are not known. Causative factors for obesity include genetics, physical inactivity, composition of the diet, and psychological causes of overeating; endocrine alterations and hypothalamus obesity do occur but are considered rare causes of obesity.

Excess fat occurs when the ingested kilocalorie level exceeds the kilocalorie level expended as energy. Because there appears to exist a constancy of body weight in the adult human and in animals, it has been suggested that the body regulates its storage of kilocalories within narrow limits. Support for this hypothesis comes from studies such as force-feeding animals by tube and conscious overeating by humans resulting in weight gain. When the tube feeding or conscious overeating is stopped, body weight decreases to its initial level.[5] Conversely, forced starvation produces weight loss which rapidly rises to, but does not exceed, the prestarvation weight when food is again available.

The nature of the regulatory mechanisms that operate to control constancy of body weight is unknown. What is known, however, is that these mechanisms can fail when overriden by genetically transmitted obesity, a high kilocalorie diet, inactivity, and various psychological conditions.

Control mechanisms for food intake appear to be integrated in the hypothalamus, the long-term regulation in the ventromedial portion and the short-term regulation in the lateral portion. Destruction of the ventromedial portion results in increased food intake followed by a rise in body weight and obesity. Destruction of the lateral hypothalamus decreases food intake.

Table 9–2 Summary of Mechanisms Proposed for Control of Food Ingestion

1. Central hypothalamus control[6]
2. Peripheral signals
   a. Stomach size
   b. Caloric content of food[7]
3. Neural factors
   a. Blood glucose levels[7]
   b. Blood amino acid imbalances[8]
   c. Serum fatty acids and glycerol levels[9]
4. Hormonal factors
   a. Insulin[8,10]
   b. Cortisol
   c. Thyroxine deficiency
   d. Hypogonadism
5. External, environmental factors
   a. Sight, smell, taste, time of day, food availability, lighting[11]
   b. Physical inactivity

In addition to hypothalamic control of food ingestion, several other control mechanisms have been proposed, such as peripheral signals, neural and hormonal factors, and external environmental cues. Because it would require an entire module in itself to discuss these mechanisms, Table 9–2 lists these mechanisms along with references to publications which give further information.

Genetics as a cause of obesity is firmly established,[6] occurring by dominant or recessive modalities, or it may be polygenic. Clear-cut genetically transmitted obesity syndromes have been identified. The importance of genetic factors in obesity is well illustrated in that a very high correlation exists:

1. Between body weights of twins living together and separately;
2. Between mother and natural child;
3. Between father and natural child; but
4. Not between parents and an adopted child.

Among obese children, more than 80% had one or both parents who were obese.[8]

Genetic factors may play an important role in the development of obesity either by direct transmission or by providing the biochemical and physiological mechanisms upon which environmental factors can operate.[12] One possible expression of genetics is the number of adipocytes a person possesses. Typically, the early period of life is characterized by an increase in both the number and size of adipocytes. The multiplication of the number of adipocytes throughout the growing years terminates at adolescence. After puberty, it appears that the number of fat cells does not change, but fat can continue to be stored by increasing the size of the already formed adipocytes. Obesity developed during childhood is termed "hypercellular" obesity, whereas obesity developed during adulthood is termed "hypertrophic."[13,14]

At present, none of the genetic forms of obesity can be detected at birth. The critical periods for the appearance of progressive childhood obesity are in the first 2 years of life and between ages 4 and 11 years. Even with the poor prognosis for childhood obesity, children represent a serious and major challenge to you.

The composition of the diet can be a direct contributor to obesity. Rodents consuming either a high-fat or a high-carbohydrate diet become obese. Caloric consumption greater than caloric expenditure will result in weight gain, but it is important to look not only at total kilocalories, but also at the carbohydrate, protein, and fat components of the caloric intake.

What Are the Consequences of Obesity?

The physiological, psychological, social, and economic problems associated with obesity are numerous. The benefits of weight reduction are the disappearance of the abnormalities which weight gain has produced and the removal of the stigma associated with obesity.

In addition to the general discomfort of extra pounds, the problems associated with obesity are numerous. Health consequences include higher mortality rates from sudden death, hypertension, diabetes mellitus, coronary artery disease, cardiovascular accidents, angina pectoris, hyperuricemia, respiratory disorders, gastrointestinal disorders, kidney disease and kidney stones, malignancy of the endometrium and possibly the breast, osteoarthritis of the weight-bearing joints, and an increased risk of accidents, surgical complications, and suicide.

Social stigma is also associated with obesity. Evidence indicates that an obese person often is not well liked by most people or by himself.[15] Obesity may be the basis for ridicule and negative social pressure resulting in job discrimination and difficulty in being admitted to college. Bray[12] states:

Physicians often find the obese unattractive as patients and find it difficult to sympathize with their problems. These negative attitudes of many in the medical profession reflect in part the frequent failure in treating obese patients, as well as attitudes of disapproval, which they often transfer to obese patients.

Assessment of Obesity

When a person seeks your assistance regarding being overweight, there is a minimum amount of information you should have before suggesting treatment. Bray suggested a flow chart for use in evaluating an overweight patient. (Figure 9–2.)

Minimum information required to properly assess overweightness and obesity includes height, weight, body mass index (Figure 9–1), and measurement of skinfold thickness; the functional status parameters such as glucose tolerance and blood pressure; and serum triglycerides and cholesterol levels.

What Are the Current Treatments of Obesity?

In the treatment of obesity, a number of approaches including "fad diets" and drugs have been used with limited success. Surgical treatment is currently recommended for only a very limited number — those for which all other methods have failed. The best approach to weight reduction appears to be nutritionally sound dietary management coupled with physical activity and behavior modification.

Several modalities are available for treating the obese patient: diet alone, diet plus behavior modification therapy, drug therapy, and surgical treatment. To be successful, the goal of each must be to reduce kilocalorie intake to a level below expenditure on a long-term basis.

Fad Diets

Because the interest in dieting is enormous and the market is profitable, diet-quacks will continue to advocate "new, miraculous" ways to lose weight. Consumers evidently do not recognize the logic that if any of these fad diets were any good, new ones would not continually be invented. Unfortunately, there are several fad diets available from which to choose, including.

- *One-emphasis diets* — An ineffective, nutritionally imbalanced diet based on the premise that one food can lead to weight loss (grapefruit or Mayo diet, banana diet)
- *Low carbohydrate diets* — A recurring phenomenon of the last century; marketed under such names as Calories Don't Count Diet, DuPont Diet, Air Force Diet, Drinking Man's Diet, Dr. Frederick's Low Carbohydrate Diet, Doctor's Quick-Weight Loss Diet (Stillman or Water Diet), and Dr. Atkins's Diet Revolution.
- *Low protein, carbohydrate-unrestricted diets* — The most popular one is Doctor's Quick-Inches-Off Diet (Stillman Diet, 1969), which is basically a vegetarian diet.
- *Protein-sparing diet* — The Last Chance Diet has received negative notoriety after reports of death and serious complications probably caused by protein/amino acid imbalances and hypokalemia.

Table 9–3 includes advantages and problems associated with various types of diets used in the treatment of obesity.

Anorectic Drugs

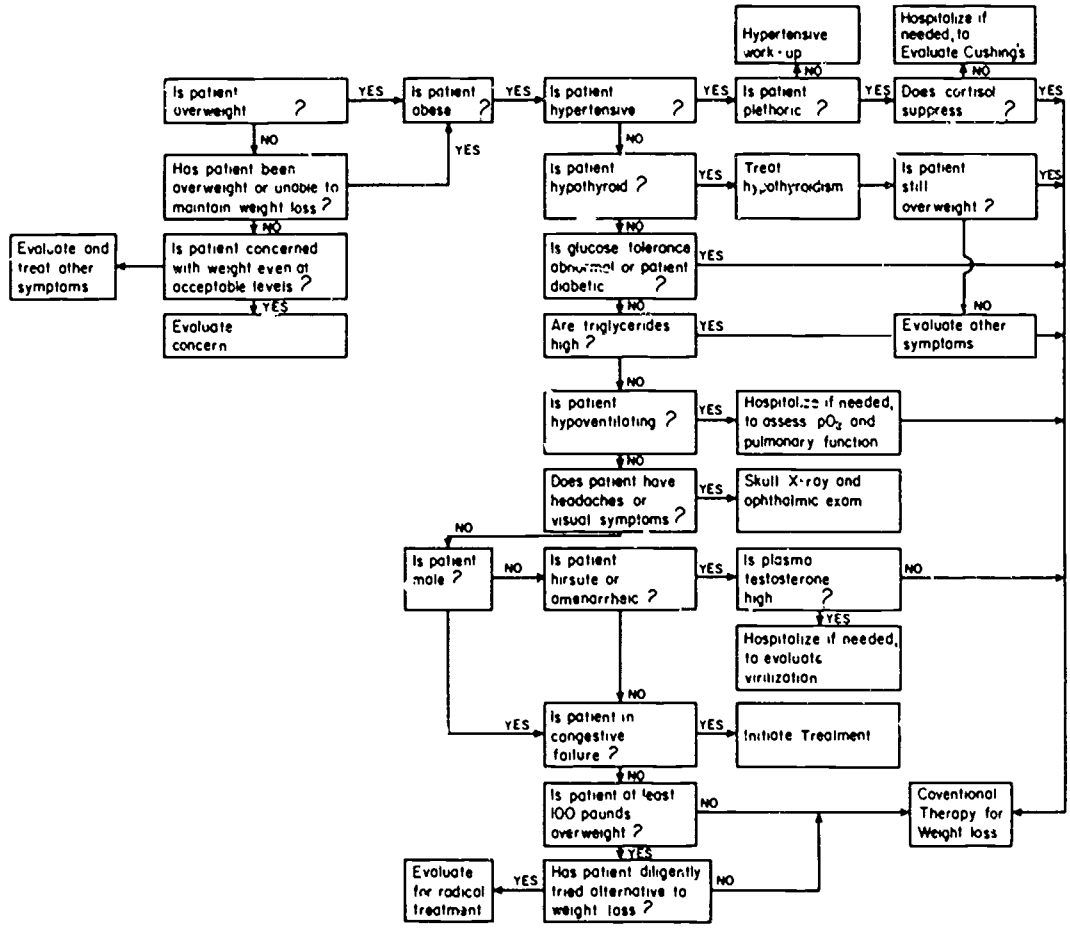
Anorectic drugs have shown favorable results when used as adjunctive therapy in weight loss programs. It must be remembered, however, that anorectic therapy for the purpose of controlling hunger must be an adjunct to, and not a substitute for, modification of eating patterns.

Drugs to suppress the appetite include amphetamines (which are the most potent) and nonamphetamines (which have variable potency levels). Most appetite-suppressant drugs increase locomotor activity and stimulate the central nervous system, some having the effects of increasing heart rate and blood pressure.

Do anorectic drugs really work, and if so, who should or should not receive them? In controlled studies, obese patients receiving anorectic drugs appear to lose significantly more weight than patients receiving a placebo.[17] [18] During the initial phase of a weight-reduction plan, anorectic agents may be used as a crutch to promote favorable, motivating results. In addition, anorectic agents may help when the patient is:

- Discouraged because of poor weight loss or relapse to overeating.

Figure 9–2 Algorithm for Evaluating an Obese Patient



Bray, G. A., Jordan, H.A., and Sims, E.A.H. "Evaluation of the Obese Patient I. An Algorithm." *Journal of the American Medical Association*, 235:2008, 1976. Used with permission of the American Medical Association, © 1976, Chicago, IL

- Emotionally upset due to a difficult life.
- In a situation which makes dieting more difficult.
- At a plateau in weight loss.

Contraindications against using anorectic agents for weight loss include patients who have:

- Severe hypertension.
- Hyperthyroidism.
- Advanced arteriosclerosis.
- Glaucoma.
- Extreme anxiety.
- Taken MAO inhibitors within two weeks.
- Known amine sensitivity.

When selecting an anorectic drug, thought must be given to its potential for abuse. The amphetamines have a high rate of abuse, whereas the following nonamphetamines have a potential for low abuse (Schedule III of the Drug Enforcement Agency for Mazindol and Schedule IV for the other three drugs):

1. Diethylpropion (use with hypertensive patients).
2. Fenfluramine (should not be used with patients with a history of depression; best choice for diabetics).
3. Mazindol (use with hypertensive patients).
4. Phentermine.

Table 9–3 Advantages and Problems Associated With Types of Diets Used in the Management of Obesity

Diet	Advantages	Possible Problems
Low Calorie Diets	Safe, nutritionally balanced, weight loss primarily fat.	Weight loss may be slower, depending upon degree of calorie restriction.
Complete Nutritional Liquid	Safe, nutritionally balanced, weight loss primarily fat, controls hunger.	Sometimes monotonous, attrition rate high.
Low Carbohydrate diet, High Protein diet, High Fat diet	Rapid initial weight loss followed by slower but substantial weight loss. Highly effective diet due to low carbohydrate intake and reduced serum insulin levels. Hunger reduced, palatable, socially acceptable.	Elevated serum cholesterol and triglyceride levels, ketosis, electrolyte imbalance (hyponatremia and hypokalemia), hyperuricemia, dehydration, specific blood changes in calcium, thiamin, riboflavin, ascorbic acid, folic acid, and vitamin A, dizziness, fatigue.
Low Protein/Low Fat (Rice Diet)	Nutritionally incomplete. Is erroneously considered beneficial for the kidneys, blood pressure, and heart function.	To be safe, this diet should be undertaken only under strict medical supervision. Bland, boring, does not educate the patient on good eating patterns. Nutritionally incomplete.
Fasting	Decreases hunger, decreases serum insulin, basal metabolic rate and blood pressure, fastest weight loss	Dehydration, ketosis, loss of bone and muscle tissue, gout, vitamin and mineral deficiencies, fatigue, apathy, low serum potassium levels, atrial arrhythmias, positional hypotension, hyperuricemia, renal stones, psychological symptoms, sudden death.
Protein-Sparing-Modified-Fast (PSMF)	Rapid weight loss in first few days.	Unacceptable danger with the exclusive use of low-quality liquid protein formulas. Modified PSMF programs should be undertaken only under medical supervision if at all. Ketosis, gout, hypokalemia, cardiac arrhythmias, hypotension, psychological symptoms, sudden death.

Adapted from Health Learning Systems, Inc.: *Dialogues in Nutrition*, Vol 3, No 1, "Obesity-An Overview"

Other types of drugs used in the treatment of obesity have not proven useful. The gastrointestinal hormone cholecystokinin has been shown to decrease food intake in rats and monkeys but not in humans. Glucagon, although associated with a reduction of food intake in humans, has not been studied as a treatment for obesity. Calorigenic drugs such as thyroid hormone can be effective in promoting weight loss; but the long-term effects pose significant problems, and the overall long-term effects appear to be no better than when diet alone is used. They should not be used for obesity. Use of growth hormone to increase basal metabolic rate may be feasible in obese patients pending further testing. Human chorionic gonadotropin, postulated to increase fat mobilization, shows little effect in treating obesity. Drugs aimed toward decreasing intestinal absorption are currently being tested in the treatment of obesity.

Surgical Treatment for Obesity

When the risks of morbidity and mortality in the grossly obese are substantial, surgical treatment for obesity may be indicated. Surgery should be considered only for patients who are at least 50 kilograms overweight. Some patients have medical problems which are aggravated by obesity and therefore may qualify for surgery at a lower weight. These include patients with hypertension, diabetes mellitus, pickwickian syndrome, or serious orthopedic problems. Before being accepted for surgery, patients should have tried to lose weight seriously without success on previous occasions. Surgery is contraindicated in patients with liver disease, renal failure, inflammatory bowel disease, and progressive myocardial disease.

The various intestinal-bypass procedures produce weight loss secondary to decreased food intake and malabsorption of ingested fat, carbohydrate, and protein. Surgical complications include operative mortality, pulmonary embolism, gastrointestinal hemorrhage, pancreatitis, renal failure, and serious wound infection. Post-operative medical complications include diarrhea (several watery stools daily), rectal irritation and hemorrhoids, liver disease, bacterial overgrowth, and polyarthritis.

Nutritional problems include hypoproteinemia, hypoalbuminemia, decreased plasma vitamins including B_{12}, A, and E, and decreased plasma minerals including potassium, calcium, and magnesium. Serum cholesterol decreases post-operatively, probably secondary to increased conversion of cholesterol to bile acids and subsequent bile acid excretion. Increased oxalate absorption secondary to increased calcium/fatty acid complex excretion and consequent renal oxalate stone formation is a frequent post-surgical problem.

Gastric operations and jaw wiring are also employed for treating obese patients. Gastric operations, including gastric bypass, gastroplasty, and gastric stapling, appear to have fewer related nutritional problems than does intestinal bypass surgery. Jaw wiring prohibits eating solid foods and allows consumption of liquid foods only. Although weight loss is possible on a solely liquid diet, weight loss can be prevented by the intake of large amounts of high-caloric liquids. Weight loss that does occur while the jaws are wired is frequently regained when the wires are removed.

Low Calorie Weight-Reduction Plan

An ideal reducing diet regimen is most effective when individualized to the patient. Some of the factors that may be considered are age, the degree of overweightness, normal level of activity, socioeconomic and ethnic factors, and weight history of the patient. An effective weight-reduction program should also be based on mutually agreed upon realistic goals, established by the patient and dietary counselor. It is paramount for the counselor to ascertain from the patient what his expectations and motivations are regarding weight loss.

To ascertain the motivation of the patient for weight reduction and the patient's weight reduction goals, several questions should be asked. When you have answers to questions such as the following, the patient and you can establish appropriate goals together which meet both medical and personal objectives:

- What does the patient want to weigh?
- How long does the patient expect it will take to achieve this weight?
- Why does the patient want to lose weight?

If you believe the patient's attitude will not support weight loss, it may be best to postpone the weight-reduction program. Some attitudes and conditions which may necessitate postponing weight reduction include:

- Limited intelligence.
- Unstable emotional status.
- Insufficient motivation.
- Unrealistic expectations.
- The "You cure me, Doctor" attitude.
- The "Nothing works for me" attitude.

The weight reduction diet must meet the patient's basic nutrient needs, supplying 100% of the Recommended Dietary Allowances (RDA). The RDA can be met when the guidelines of The Basic Four Food Groups are followed (see Module 1 on the nutrient content of foods). A 1,000 kilocalorie diet for the female and 1,200 kilocalorie diet for the male are the lowest caloric levels possible to obtain a nutritionally balanced weight-loss plan. Less than a 1,000 kilocalorie intake cannot meet the RDA unless vitamin/mineral supplements are taken. It is recommended that carbohydrate intake not be less than 50 to 100 grams daily for an extended period.

To plan a reducing diet, the first step must be to calculate the energy requirement for the patient. The nomogram in Figure 9–3 can be used to assess caloric expenditure. The second step is to use this level of caloric expenditure and work with the patient to establish a daily caloric level which will support weight loss. Then establish a meal pattern consistent with the level which the patient feels is practical for his reduction diet.

All diets in which kilocalorie intake is less than kilocalorie expenditure will result in a rapid, initial water loss and subsequent weight loss due to the breakdown of liver glycogen and labile protein stores. Following this initial weight loss, lasting two to four days depending upon kilocalorie intake and expenditure, a steady but less rapid weight loss will occur which represents adipose tissue loss.

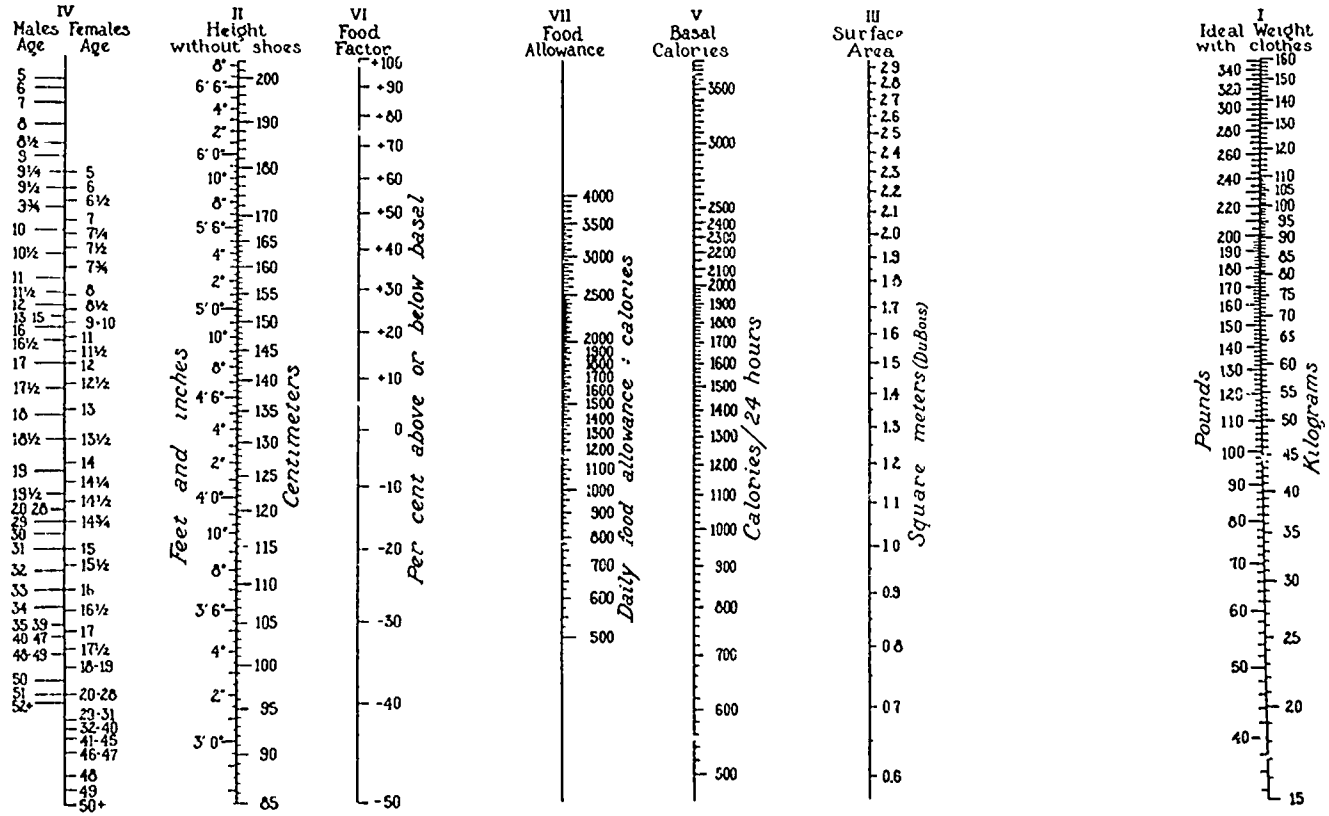
The initial, rapid loss of body weight associated with any diet where kilocalorie intake is less than kilocalorie expenditure is due to loss of liver glycogen, labile protein stores, and water stored with these substances in an amount three to four times greater than these substances by weight. Therefore, with a loss of one gram of glycogen or labile protein (4 kilocalories), 3 to 4 grams of water are also lost. If, for example, a person consumes 500 kilocalories fewer per day for three days than he expends, 125 grams of liver glycogen and labile protein stores are lost per day plus an additional 375 to 500 grams of water equal to a total of 500 to 625 grams, or 1.1 to 1.4 pounds, per day. Thus, the initial rapid weight loss is predominantly water.

However, this trend is self-limiting since stores of labile protein and liver glycogen are not large and are exhausted within two to four days. After that, weight loss represents loss of adipose tissue. Because water storage in adipose tissue is low (15% by weight), adipose tissue is an energy-rich storage tissue. One pound (454 grams) of adipose tissue, 15% or 68 grams of which is water, 85% or 386 grams of which is triglyceride, stores approximately 3,500 potential kilocalories.

After the initial water loss, further weight loss is slower and more steady until plateaus are reached. During this slow but steady weight loss period, you and the patient should decide if the caloric consumption level is feasible for the patient to follow and if it is medically and nutritionally appropriate for achieving the desired weight loss. A weight-reduction diet of approximately 500 kilocalories of intake fewer per day than expended will result in a 1 pound weight loss of adipose tissue per week. A weight loss of 1 to 2 pounds of adipose tissue per week is desirable. The lower the intake of carbohydrate (not below 50 to 100 grams daily), the faster the weight loss due to the lowered insulin/glucagon ratio and the effect that this altered ratio has on stimulation of gluconeogenesis and lipolysis and inhibition of lipogenesis.

Practical suggestions which may help the person who diets include increasing the intake of vegetables, fruits, and cereals/grains and decreasing the intake of fat and sugar, particularly the high carbohydrate, high-caloric foods and drinks such as pies, cakes, concentrated sweets, alcohol, highly sweetened beverages, and fried foods. Foods with no or limited caloric value which may be en-

Figure 9–3 Nomogram for Estimating Caloric Needs



Directions for Estimating Caloric Requirement To determine the desired allowance of calories, proceed as follows. 1. Locate the ideal weight on Column I by means of a common pin. 2. Bring edge of one end of a 12 or 15-inch ruler against the pin 3 Swing the other end of the ruler to the patient's height on Column II. 4 Transfer the pin to the point where the ruler crosses Column III 5 Hold the ruler against the pin in Column III 6 Swing the left hand end of the ruler to the patient's sex and age (measured from last birthday) given in Column IV (these positions correspond to the Mayo Clinic's metabolism standards for age and sex). 7 Transfer the pin to the point where the ruler crosses Column V. This gives the basal caloric requirement (basal calories) of the patient for 24 hours and represents the calories required by the fasting patient when resting in bed 8 To provide the extra calories for activity and work, the basal calories are increased by a percentage To the basal calories for adults add. 50 to 80 per cent for manual laborers, 30 to 40 per cent for light work or 10 to 20 per cent for restricted activity such as resting in a room or in bed To the basal calories for children add 50 to 100 per cent for children ages 5 to 15 years. This computation may be done by simple arithmetic or by the use of Columns VI and VII. If the latter method is chosen, locate the "per cent above or below basal" desired in Column VI By means of the ruler connect this point with the pin on Column V. Transfer the pin to the point where the ruler crosses Column VII This represents the calories estimated to be required by the patient.

couraged in the patient's diet include those listed in Table 9–4.

Spices and Seasonings

The sample pattern of a 1,200 kilocalorie diet shown in Table 9–5 is included to show that on a 1,200 kilocalorie diet, the food can be palatable, attractive, and nutritionally adequate. Its caloric content is composed of 25% fat, 21% protein, and 54% carbohydrate. Table 9–6 was used to calculate the kilocalorie, protein, carbohydrate, and fat content of the diet and is a very good table for patients to carry with them in order to "count calories." You should encourage the patient to eat according to The Daily Food Guide which includes four basic food groups in amounts shown as follows for the adult:

- *Meat Group:* 4 oz lean meat, fish, or poultry and 1 egg daily.
- *Milk Group:* 2 cups skim milk or the equivalent in cottage cheese or low-fat cheese.
- *Fruits and Vegetable Group.* 2 fruits (one of which is a citrus fruit) and 2 vegetables (one of which is a green leafy or deep yellow vegetable, eaten every other day).
- *Bread/Cereal/Grain Group:* 4 servings daily.

Above all, patients should be encouraged to make changes in eating behaviors that will remain with them permanently. Motivating patients to make proper diet a life-long goal requires continual reinforcement. When a dietitian is available, the patient should be referred for instruction and follow-up.

For the patient who believes that a reduction diet is impossible to follow due to financial cost, the following suggestions may be helpful.

- Reduce the amount of food and the intake of high-caloric, high-cost snack foods and beverages such as pop, beer, candy, and potato chips.
- Prepare foods at home or carry lunch instead of buying prepared foods or eating out.
- Shop in supermarkets and buy in amounts that cost less per serving as long as the quantity can be used without spoilage. Store brands and unbrands may be good values. Shop with a list and a full stomach. Purchase foods in season. Watch for grocery specials and use coupons for items needed.
- Avoid buying special "diet" foods; instead, modify regular foods such as by rinsing canned sweetened fruit. Read labels to get more nutritional value for the food dollar.
- Use grains, legumes, eggs, powdered skim milk, and low-cost protein foods such as poultry and frozen fish.
- Obtain help and booklets from the local county extension service, such as "Money Saving Main Dishes," or from the Consumer Service of the U.S. Department of Agriculture, Washington, DC 20250.
- Find out if the patient and family qualify for food stamps and programs of prepared meals or have access to a local food-buying cooperative.

If the patient has a large amount of weight to lose, it may be helpful to establish short-term immediate goals such as a consistent loss of one pound per week for four weeks following the rapid initial weight loss. Once each short-term goal is achieved, another goal should immediately be set.

Table 9–4 Low-Calorie Foods Acceptable on a Low-Calorie Diet

Beverages	Vegetables
Coffee or tea, without cream, milk or sugar	Asparagus
Clear broth or bouillon or consomme'	Broccoli
Unsweetened lemon juice	Brussels sprouts
	Beet greens
	Beets
	Cauliflower
	Celery
	Chard
	Cucumber
	Dandelion greens
	Green beans
	Kale
	Lettuce
	Onions
	Pepper
	Radish
	Sauerkraut
	Spinach
	Watercress
	Spices and Seasonings

A "no weight gain for two weeks" goal is very appropriate during plateau periods which occur frequently due to metabolic changes associated with weight loss.

Long-term goals with regard to weight loss must be realistic. A realistic target date to reach a goal will prevent early discouragement and dropping out from the program. An example of a realistic long-term goal is a 20 to 30 pound weight loss over a 4- to 5-month period of time. Other long-term goals in addition to weight loss should be to

- Change eating patterns to maintain weight loss
- Improve total physical condition.
- Prevent medical consequences associated with obesity.
- Control concurrent medical problems.

If a patient does not achieve the desirable weight but stabilizes a few pounds above this weight (this is a frequent occurrence), the patient should be helped to accept this weight and avoid the disappointment-overeating-weight gain cycle that frequently occurs.

Behavior Modification Techniques

Behavior modification is an important aspect of any weight-reduction program. Techniques of behavior modification are based upon the control of stimuli for eating and on positive reinforcement.

Behavior modification techniques are aimed at the identification of habits which have led to over-

Table 9–5 Sample 1,200 Kilocalorie Daily Diet Plan

Food	Kilocalories
Breakfast	
Toast, 1 slice or Cereal, 1/2 cup unsweetened	65
Egg, 1 or Ham, 1 ounce, lean	70
Margarine, 1 teaspoon	45
Milk, 1/2 cup skimmed	45
Orange juice, 1 cup	80
Lunch	
Lean meat, fish, poultry, cheese, 2 ounces	140
Bread, 1 slice or Muffin, 1 or macaroni, 1/2 cup	65
Vegetables, raw as desired	0
Margarine, 1 teaspoon	45
Milk, 1/2 cup skimmed	45
Fruit, 1/2 cup unsweetened or 1 small raw fruit	50
Dinner	
Lean meat, fish, poultry, cheese, 2 ounces	140
Potato, peas, lima beans, or corn, 1/2 cup, cooked	80
Vegetable, 1/2 cup cooked	30
Milk, 1 cup skimmed	90
Fruit, 1/2 cup unsweetened or 1 small raw fruit	50
Evening Snack	
Fruit, 1 small fresh fruit	50
Popped corn, unbuttered, 3 cups	130

Table 9–6 Carbohydrate, Protein, Fat, and Kilocalorie Content of Foods in Basic Food Groups

Food	Carbohydrate (gram)	Protein (gram)	Fat (gram)	Kilocalories per serving
Milk Group				
1 cup whole milk	12	8	10	170
1 inch cube cheddar cheese	1	6	9	110
1 ounce Swiss processed cheese	1	6	9	110
1/2 cup cottage cheese	3	16	5	120
1 cup 2% (lowfat) milk	12	8	5	125
1 cup skimmed (non-fat dry) milk	12	8	0	80
Meat Group				
1 ounce beef (baby beef, chipped beef, chuck tenderloin, round, rump), lamb, pork, (ham, center), veal, poultry (without skin), fish and shellfish	0	7	3	55
1 ounce beef (ground, corned), pork (loin, arm, Canadian bacon), liver, heart, kidney, egg, peanut butter (2 tablespoons), 1 egg	0	7	5	73
Beans (white, pinto, lima and cowpeas, 1/2 cup)	25	8	0	125
Lunch meat (2 ounces), 1 frankfurter, 2 ounces sausage, 3 slices fried bacon	0	9	16	185
Bread Group				
Bread (1 slice), 1/2 small bagel or English muffin or hotdog roll or hamburger bun, 1 tortilla, 3/4 cup unsweetened ready-to-eat cereal, 1/2 cup cooked cereal or spaghetti or macaroni or noodles, 3 cups popped corn (unbuttered), 4 to 6 2" square crackers, 1/3 cup corn, 1/2 cup green peas, 1/2 cup potato, 1/4 cup yam, 1 2-inch biscuit or muffin, 1 waffle or pancake	15	2	0	70
Fruit Group				
Small fresh apple or orange or pear or peach, 1/2 cup applesauce or berries or grapefruit, 1/4 cup grape juice, 1/3 cup apple juice/cider, 2 medium apricots, 1/2 small banana, 10 to 12 large cherries or grapes (unsweetened)	10	0	0	40
Vegetable Group				
1/2 cup all vegetables except those in bread and meat group and the following which are negligible in kilocalories: lettuce, radishes, watercress, endive, parsley, Chinese cabbage, escarole	5	2	0	25
Fat Group				
1 teaspoon margarine or oil or butter or lard or mayonnaise, 1 tablespoon commerical salad dressings	0	0	5	45

eating and the specific techniques to change these habits. Several techniques that help patients recognize and restructure eating patterns have been identified.[16] These are best introduced slowly over a ten-week period and include:

- Recording intake of food and activities associated with eating.
- Identifying behaviors or situations which lead to overeating.
- Eliminating inappropriate cues to eating.
- Slowing the act of eating.
- Teaching patients how to follow their diet when eating out.

Behavior modification, coupled with diet, short-term adjunctive use of anorectic agents, and physical activity, appears to be most successful in promoting weight loss.

One of the first steps in the behavior modification program is to ascertain an accurate picture of the patient's eating patterns. The patient should be asked to keep a one- to two-week food diary, reporting what was eaten, how much was eaten, where and when the food was eaten, and how the patient felt while eating (such as angry, happy, bored, sad), what the patient did while eating (such as reading the paper, writing letters, talking), how long it took to eat the meal, and how hungry the patient was when eating. You may think of other questions which would be appropriate to help patients understand reasons for their eating patterns. It is important, through this first step, for patients to find out what their eating patterns are, how much they eat, and when and why they overeat, before they seek to modify eating behaviors.

Behavior modification techniques include the recommendation that the patients give themselves a reward such as a dollar per pound weight loss, given to themselves weekly with the understanding that they can buy whatever they want, except food.

Appendix A at the end of this module is a handout you can use with patients to help implement behavior modification techniques. As stated on the handout, you can duplicate these instructions for office use without needing to obtain permission from the author.[16] For further discussion of behavior modification techniques, please refer to the Resources for the Physician and the Resources for the Patient at the end of this module.

Physical Activity

Physical activity should be a part of weight reduction programs. Although home exercise programs meet with little success, most obese persons should be advised to engage in daily activities and an enjoyable sport to be done daily with a companion whenever possible. Patients should also be encouraged to use the most energetic means of doing routine tasks, whenever feasible, such as walking up stairs instead of riding the elevator or walking instead of using the car. Above all, the counselor should frequently remind the patient that exercise *does* burn up calories and has added benefits as well, such as:

- Improved cardiovascular function.
- Improved muscle tone.
- Improved physical appearance.
- Improved mental attitud.

If you or the patient desire additional information on the caloric expenditure per given task or sport and how one can calculate energy expenditure for various types of activities, several references are available.[12,16,19]

Self-Help Groups

Since weight control is often a lifelong problem, the patient needs help from a supportive, nonjudgmental counselor and family to change habits and lifestyle. Community self-help groups, where patients receive added motivation, often contribute extra help.

Many reasons, including vanity and medical complications, are given by the obese patient for seeking help. Because the chances for achieving and maintaining weight loss are slim, the patient must possess a high degree of motivation. Similarly, all persons assisting in the care of the obese person must exhibit a supportive, nonjudgmental attitude and be able to provide sympathetic understanding of the emotional problems and difficulties encountered by the patient when weight loss is attempted.

Table 9-7 Community Support Groups for Weight Reduction

ORGANIZATION	NATIONAL ADDRESS	PROGRAM	DIET	COST
DIET WORKSHOP, INC.	111 Washington St. Brookline, Mass. 02146	Founded - 1965 Franchise in U.S. and Canada 4 part program: diet, nutrition behavior modification, exercise Weekly classes Work closely on diet with each member Both men and women in classes School atmosphere	Recently introduced 6 cycle diet based on 3 balanced meals per day. Progresses from 750 calories to 1,200 calories in 6 weeks.	Registration fee plus weekly fee. Varies with franchise.
OVEREATERS ANONYMOUS	World Service Office 2190 190th Street Torrance, California 90504	Founded - 1960 Volunteer organization Follows steps of alcoholic program (AA) Preserve anonymity-strong spiritual basis Regular meetings plus phone support Fellowship of men and women who share experiences that may solve common problem.	Expected to get diet from physician. Three eating plans provided. Three moderate meals per day. No between-meal foods except low-calorie beverages.	None. May donate.
TOPS (Take Off Pounds Sensibly)	4575 S. 5th Street P.O. Box 07489 Milwaukee, Wis. 53207	Founded - 1948 International, non-profit social organization Separate clubs for men and women Weekly meetings, magazine Competition over pounds lost with awards Maintenance program clubs Sponsor research	Diet from physician. Recommend no special foods.	Nominal annual dues.
WEIGHT WATCHERS INTERNATIONAL, INC.	800 Community Dr. Manhasset, New York 11030	Founded - 1963 Franchise-International Similar to TOPS - members weigh in and are acclaimed for losses Program includes diet, nutrition education and behavior modification Publications include Cookbook and Magazine	Strict diet using Recommended Dietary Allowances as basis. Reduction and maintenance level diets. No substituting foods. No meal skipping.	Registration fee plus weekly fee. Varies with franchise.

The family can either assist or hinder the dieting person. It is not unusual to find that a family member may not support the dieting person for personal and perhaps selfish reasons. For example, many men desire a plump spouse, and many women fix meals that are too large as a demonstration of their affection for their husband and children. You should discuss the risks of overweightness with the dieting person's family members and attempt to gain their support for the patient. They should also be told that patients who are most successful at losing weight are those who have supportive families.

Many community self-help groups are available as an adjunct to the total weight-reduction program. Such organizations, using group support, frequently add the extra motivation needed by many patients to adhere to the weight-reduction program. Table 9–7 lists four such community support groups which have demonstrated success as an adjunct to weight-reduction programs.

It should be remembered that follow-up visits must be a part of the total weight-reduction program. During the follow-up visit, the discussion should center upon the patient's progress and problems which the patient may be experiencing with various parts of the program, time should also be spent in supporting and motivating the patient to continue following the program. Initial weekly and later bimonthly visits should be instituted during periods of active weight loss. When the weight goal or an acceptable weight has been achieved, it would be helpful to schedule monthly visits to assist in maintaining the lowered body weight.

Summary

In the treatment of obesity, several approaches including "fad diets" have been used with limited success. The best approach to weight reduction appears to be nutritionally sound dietary management coupled with physical activity and behavior modification. If anorectic drugs are used, they must be used for a short term and as an adjunct to, not a substitute for, modification of eating patterns. An ideal reducing diet regimen is most effective when individualized to the patient and based upon mutual and realistic goals established by the patient and the dietary counselor. A low-carbohydrate intake should not be less than 50 to 100 grams daily for an extended period. Since weight control is often a lifetime problem, the patient needs help from a supportive, nonjudgmental counselor to change habits and lifestyle Community self-help groups provide added motivation.

Test Your Knowledge

1. Mrs. C.T. comes to you desiring to lose weight. She is 5 feet 3 inches tall, medium frame, and weighs 167½ pounds. Using Table 9–1, find the midpoint of her "desirable weight."

2. Using Figure 9–1, plot her height and weight. Which of the following is she?
   a. Acceptable weight
   b. Overweight
   c. Obese

3. From your work-up procedures, you find she is 35 years old, divorced, mother of two children, has an elevated blood pressure of 160/100, has normal levels of fasting blood glucose and lipids and is not hypothyroid, pickwickian, or hirsute. She gives you the following typical dietary intake.

Breakfast: 1 poached or fried egg
1 sl toast
1 tsp margarine
½ c 2% milk

Lunch: If at home (3 times per week):
1 c 2% milk
6 lg cookies
1 lg banana
If at work (4 times per week):
2 c casserole
1 c mashed potatoes
2 hard rolls
½ c fruited gelatin
½ c applesauce
12 oz diet Pepsi

Snack: Candy, "a lot"

Dinner: 4 oz meat
1 med potato
¼ c gravy
½ c cooked vegetable
salad, occasionally
water

Snack: Pie, cake, sweets,
chocolate candy;
"I crave sweets"

You also learn that she works in a restaurant 4 days a week and does domestic work 3 days a week. She participates in no planned sports in addition to her work. You therefore decide that she has a moderately active life-style. She receives food stamps and aid for dependent children. Mrs. C.T. states that she has tried to lose weight several times without success but has not been a member of any commercial weight control group because she believes they are "too expensive." She states she eats quickly when upset, which is often, as she does not like her work at the restaurant.

Using Figure 9–3, estimate her food allowance from Column VII.

4. Assuming a daily energy expenditure of 1,800 kilocalories, what kilocalorie level of weight reduction would you choose for Mrs. C.T.?

5. Read the Guide to Changing Eating Habits, Ideas to Lose Weight, which is in Appendix A at the end of this module, and suggest several behavior modification techniques for Mrs. C.T.

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Resources for the Physician

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Hafen, B.Z. (ed.): *Overweight and Obesity: Causes, Fallacies, Treatment*. Provo, UT, Brigham Young University Press, 1975. 205 University Press Building, 84602. 410 pp. (softcover, $8.95)
Seventy-five previously published essays and research papers on the etiology and treatment of obesity comprise this basic reference.

National Dairy Council: *Food Models B012A*. Rosemont, IL, 60018. ($6.00 per set)
146 full-color photographic, life-size models. A variety of daily meals, snacks, and standard food portion sizes can be depicted with the Food Models. Cultural foods are included.

Stuart, R.B. and Davis, B.: *Slim Chance in a Fat World. Behavioral Control of Obesity*. Champaign, IL, Research Press Company, 1972. Box 3177, 61820. 240 pp. ($6.95, professional edition).
An excellent approach to the solution of obesity through behavior modification. Stresses the role of activity in conjunction with diet. A well-documented book.

Bray, G., (ed.): *Obesity in Perspective*. Washington, DC, Department of Health, Education, and Welfare, 1970. U.S. Government Printing Office, 20402, Pub. No. (N.I.H.), 75-708. 107 pp. ($5.65)
A monograph, the product of a Conference on Obesity held at the National Institutes of Health, reaffirms the complex nature of obesity and emphasizes the need for research on psychological, physiological, and biochemical determinants of this important health derangement.

Seelig, R.A. *Obesity*. Alexandria, VA, United Fresh Fruit and Vegetable Association, 1979. (727 N. Washington St. 22314, free).
A 10-page monograph providing a concise report on present knowledge about etiology and treatment of obesity.

Weight Watchers International, Inc. *A Rational Approach to Weight Control*. Manhasset, N.Y., Weight Watchers International, Inc., 1978 (800 Community Drive, 11030).
Brochure available without charge which provides nutritional analysis of the Weight Watchers eating plan, a menu plan of a typical day's diet and a well-referenced discussion of the role of exercise, drug therapy, and intestinal bypass surgery in the treatment of obesity.

Resources for the Patient

Books

Bowen, A.: *The Diabetic Gourmet*. New York, Harper & Row, ($8.95)
Includes discussion of nutritional principles, recipes with nutrient content and exchanges per serving and instructions for calculating, revising, and creating recipes. Useful for reduction diets as well as diabetic diets.

Deutsch, R.M.: *The New Nuts Among the Berries* Palo Alto, CA, Bull Publishing, 1977. P.O. Box 208, 94302. 359 pp. (hardcover $8.99, softcover $4.95)
New and old dietary fads and their promoters and followers are documented

Jones, J.: *The Calculating Cook: A Gourmet Cookbook for Diabetics & Dieters*. San Francisco, 101 Productions, 1972. 192 pp. (hardcover $7.95, softcover $4.95)
A gourmet cookbook with menus and recipes using the Exchange System

Judd, H.S., Terril, J. and Langewalter, E.: *California Weight Loss Program* Palo Alto, CA, HSJ Publishers, 1976. ($1.95 plus 50¢ postage) Nutritional guidance accompanies the psychologic techniques. Particularly suited to the do-it-yourself dieter as opposed to a person who responds to group therapy.

Konishi, F.: *Exercise Equivalents of Foods*, Carbondale, IL, Southern Illinois University Press, 1974. P.O. Box 3697. 75 pp. (hardcover $6.95; Archturus Paperbacks Service, 1975, paper $1.95)

Nidetch, J.: *Weight Watchers New Program Cookbook*, New York, The American Library, Inc., 1978. 10019. 378 pp. ($9.95)
Over 600 recipes plus menus. Complete updated program used by Weight Watchers. Recipes follow the categories of the basic Weight Watchers Food Plan.

Stuart, R.B. and David, B.: *Slim Chance in a Fat World* Champaign, IL, Research Press Company, 1972. Box 3177, 61820. condensed edition, 93 pp. ($3.95)

Books No Longer in Print – May be Obtained From the Library

Glenn, M.B.: *But I Don't Eat that Much*. New York, E.P. Dutton, 1974, 237 pp
Questions that are most frequently asked by individuals facing problems of obesity are answered. Facts concerning the approach to weight loss appear medically and scientifically accurate.

Katch, F.I. and McArdle, W.D.: *Nutrition, Weight Control, and Exercise* Boston, MA, Houghton Miffin, 1977. 365 pp.
A unique combination of theoretical and practical information on nutrition and physiology as it pertains to exercise and weight control is included.

Ferguson, J.M.: *Habits, Not Diets. The Real Way to Weight Control*. Palo Alto, CA, Bull Publishing, 1976. 252 pp
A one volume do-it-yourself program recommended to both professionals and lay persons as a realistic self-help method for controlling overeating.

Osman, J.D.: *Thin from Within*. New York, Hart Publishing, Inc., 400 pp
The relationship of foods, energy intake and expenditure, and weight are discussed as well as behavior modification techniques. A food composition table listing calories and nutrients is included.

Solomon, N. and Knudson, M.: *Dr. Solomon's Easy, No-Risk Diet* Coward, McCann, & Geoghegan, Inc., 1974. 287 pp.
Based upon an exchange program, and including some commercially prepared ready-to-eat foods, this book should help any individual plan a nutritionally sound reducing diet.

Booklets That May Be Purchased

Irvin, M.H.K.: "Overweight — A Problem for Millions." Public Affairs Pamphlet No. 364A, Public Affairs Pamphlets, 381 Park Avenue South, New York, NY, 10016, 24 pp. ($.50)

U.S. Department of Agriculture: "Food and Your Weight." Home and Garden Bulletin No. 74. Washington, DC, U.S. Government Printing Office, 20402, November, 1977. 38 pp. ($1.00)

U.S. Department of Health, Education, and Welfare: "Facts About Obesity." DHEW Publication No. (N.I.H.) 76-974. Washington, DC, U.S. Government Printing Office, 20402, 1977. 20 pp. ($1.10)

The Chicago Nutrition Association publishes Nutrition References and Reviews. This annotated listing includes recommended and not-recommended books for laypeople. An edition is due in 1980. The 975 edition is available for $2.00 from.
Chicago Nutrition • Nutrition References
550 South Fourth Avenue • Des Plaines, IL 60016

Pamphlets

Harvard Medical School of Health Letter
79 Garden Street
Cambridge, Massachusetts 02138
A concise, well-written, authoritative pamphlet of medical, nutrition, food, and other information for the public. $12.00 per year subscription.

Weight Watchers International, Inc. "Overweight and Your Health . . . The Vital Connection." Manhasset, NY, Weight Watchers International, Inc. (800 Community Drive, 11030).
A presentation to lay people of the medical complications of obesity; a useful doctor's office handout to accompany diet instruction.

Answers

1. Midpoint of desirable weight = 116 pounds.
2. She plots to be overweight, yet close to obese. She is 144% of her "desirable weight," indicating obesity. Her subscapular skinfold measurement confirms obesity with a measure of 29.0 mm.
3. Food allowance = 1,800 kilocalories assuming a +20% food factor in Column VI.
4. A 1 pound per week weight reduction (equivalent to 3,500 kilocalories per week or approximately a 500 kilocalorie reduction per day less than expenditure) would indicate a 1,300 kilocalorie weight-reduction diet. Negotiate this level with the patient; obtain her acceptance of this level. Give her suggestions for how to cut excess kilocalories from her typical intake, substituting low caloric foods from Table 9-4. Offer suggestions for low cost foods.
5. Give the patient a copy of the Guide to Changing Eating Habits: Ideas to Lose Weight (see Appendix A) — a behavior modification technique handout — and discuss it with her. Ascertain her motivation level to follow a reduction diet and her physical activity program. Consider whether her current attitude or life situation provides any indication that weight reduction should be postponed.

Appendix A

Guide to Changing Eating Habits: Ideas to Lose Weight

Eating habits contribute to the problem of excess weight. As with other habits, your eating patterns are a learned response to certain stimuli. For example, you may be stimulated to eat because you feel angry—or because you see or smell food. However, other cues to eating may be less clear-cut. Frequently, the most obscure cues are related to emotions or activities. You may nibble when you're anxious, bored, or watching television. You may not be hungry, but you still have an impulse to eat. Here is what happens when such cues become habit:

Cue ⟶	Behavior ⟶	Consequence
(anxiety, boredom, television)	(eating)	(relief of boredom, more enjoyment of TV)

The key to weight control is learning how to change this type of behavior.

The following suggestions may help. First, keep a food diary to identify the times and places you eat too much. As you become more aware of your eating habits, you'll learn to eliminate some of the cues that lead to overeating. Next, choose one or two suggestions listed here and incorporate them into your daily routine. Every week or so, choose one or two more suggestions. Go slowly. Although these suggestions appear to be very simple, they are deceptively so. It would be very frustrating to try to change all your eating habits at once. In fact, trying too much right away may reduce your chance of making successful changes in your eating patterns that could lead to permanent weight loss. Remember, it took time to put on weight. It will take some time to get rid of it.

Changing Eating Habits: Guide for Physicians

Situation	Physician Statement/ Question	Objective	Patient Example	Possible Behavior Change
Setting up the weight reduction program	"Keep a food diary for 1-2 weeks."	Without being judgmental, allow the patient to discover problem areas.	The patient may note that he drinks more alcohol than he had realized.	After calculating calories, the patient may limit himself to one glass of wine rather than two beers before dinner.
Review of diet diary: The patient has forgotten to list meals fully	"Your diet diary is very helpful. What you've noted is very clear."	Verbally reward the patient's efforts, even if marginal. A reprimand punishes the patient for seeking help.		
	"When do you write down what you've eaten?"	Prompt the patient to consider his commitment to the weight reduction program. Offer suggestions on how other patients keep the diary.	The patient may try to remember everything he's eaten at the end of the day.	The patient keeps a list in a pocket or purse so he can immediately write down what he eats.
Review of diet diary	"Have you noticed that you eat at certain times or in certain situations?"	Help the patient become aware that eating may be associated with certain times or activities.	The food diary reveals snacking at 3-4 PM every day. Or the patient may eat a doughnut during coffee breaks at work.	The patient goes for a walk at 3 PM or gets involved in some enjoyable activity. Or the patient avoids the office canteen. He takes a walk during coffee breaks or finds a place to have coffee only.
Review of diet diary	"You may find that your hunger pangs will fade away if you delay snacking for about 20 minutes."	Encourage an active response to conditioned impulses to eat.	The patient is used to snacking at 10 AM or 3 PM.	The patient delays eating for 30 minutes. When the hunger pangs fade, the patient learns that the impulse to eat doesn't come from real hunger.
Review of diet diary	"Have you noticed that you combine eating with other activities, such as reading or watching TV?"	Promote awareness of eating habits. Show the patient how eating is involved with other activities that become cues to eat.	A businessman reads a newspaper during lunch. He is not aware of what he is eating.	The patient reads the newspaper before or after—but not during—lunch. He becomes more aware of what he is eating.
Suggesting a diet; implementing a reward system	"As you lose weight, reward yourself for your efforts. Losing weight is a form of reward, of course, but what else would you like to have?"	Encourage the patient to give himself something he likes that is suitable for a frequent reward.	The patient chooses money as a reward. He decides on what he wants to buy.	The patient gives himself $1 for every pound (0.45 kg) he loses. He uses this money to buy something he really wants, decided on ahead of time.

Changing Eating Habits: Guide for Patients

Suggestion	Why It's Important	What May Happen
Keep a food diary for 1-2 weeks. List everything you eat—how much, when, and how often.	You may be able to spot certain patterns of eating that lead to high caloric intake.	You may learn that drinks and hors d'oeuvres before lunch and dinner account for one-quarter of your total recommended caloric allowance. Limit yourself to one glass of wine and eliminate nibbling.
Keep a list with you at all times.	It's easier—and much more effective—to write down what you've eaten right away.	You may find that you eat foods that you've never really noticed, such as: ▪ Extra sugar in cereal or coffee ▪ Nibbles of food from a child's plate ▪ A piece of candy or a snack as you pass by a container
Change your daily schedule if you crave food at a particular time or in certain situations. Try to arrange activities where you can't eat during the "danger" times.	The impulse to eat at a specific time may be a conditioned response. This impulse will gradually disappear if you stop reinforcing the cue (time or activity) with food (eating).	If you arrange to be busy at times you ordinarily snack, you may not notice your "hunger" or impulse to eat. Be sure that the activity you choose is truly enjoyable so it can compete with the urge to eat.
Set a kitchen timer for 20-30 minutes when you feel like snacking. Make a bargain with yourself that you'll eat only after the timer goes off.	Hunger pangs may last only about 20 minutes.	Your "hunger" fades away if you ignore it or delay eating.
When you eat, make it your only activity. Do not eat and also read, watch TV, or drive a car.	Eating should be an isolated activity, completely separated from any other activity that may serve as a cue to eat. Making eating a conscious act—rather than unconscious—will help you to become more aware of every bite and to savor it	You may learn to enjoy eating more. By concentrating on every bite, you may better appreciate taste and texture.
Reward yourself for losing weight. Choose a reward that you'd really like, other than food.	Eating is often a reward. By giving yourself something you'd really like to have or do, you can help change your eating behavior.	You may decide to give yourself $1 for every pound (0.45 kg) you lose. Decide on what you want to buy ahead of time. Use your reward money to buy something you really want: It may be fun.

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Situation	Physician Statement/ Question	Objective	Patient Example	Possible Behavior Change
Follow-up appointment: Helping the patient become aware of cues to eat	"When you have unpleasant feelings, do you eat? Or, when you are happy or excited, do you eat?"	Guide the patient toward insight that he may eat when he feels angry, depressed, anxious, frustrated, or bored.	The patient recognizes that he soothes bad feelings with food.	The patient may learn to talk about feelings rather than feeding them.
Follow-up appointment: Helping the patient change eating habits	"It's very important to slow down eating. It takes 20 minutes for your stomach to signal your brain that it's full."	Give the patient information that will help him understand how to control overeating.	The patient ordinarily eats too fast. He may gulp his food without savoring the taste.	The patient slows down the eating process. He avoids stuffing himself, and he begins to enjoy the taste and texture of his food.
Follow-up appointment: Helping the patient become aware of cues to eat	"Have you noticed that you may be more sensitive to the sight and smell of food than other people?"	Help the patient recognize that he is sensitive to food cues. Awareness that sensory cues play a role in overeating may help the patient avoid tempting situations.	The patient has an urge to eat each time he passes a bakery.	The patient learns to walk or drive down another street to avoid going by the bakery.
Follow-up appointment: Helping the patient become aware of cues to eat	"Is food plainly visible in your home or at work?"	Help the patient recognize the sight cues that may trigger eating. Motivate the patient to make food less visible.	The patient keeps a jar of candy on his desk at work.	The patient removes the jar or puts it in a place out of sight and reach.
Follow-up appointment: Helping the patient become aware of cues to eat	"Are serving dishes left on the dinner table during meals?"	Help the patient recognize that visual cues lead to overeating, such as eating second helpings.	The patient may note that serving dishes are usually left on the table.	The patient would have to go to the kitchen for a second helping if serving dishes are kept off the table.
Follow-up appointment: Helping the patient become aware of cues to eat	"Have you thought about your eating habits at work?"	Help the patient identify the cues to eating in his total life.	The patient eats at his desk.	The patient eats in the cafeteria or uses a placemat at his desk to change the physical situation.
Follow-up appointment: Helping the patient become aware of cues to eat	"Can you see how your customary eating habits can turn into cues to eat? Do you see why you need to learn new habits?"	Positively reinforce patient awareness of eating habits that contribute to overeating. Help the patient focus on habits that can be changed.	The patient has noticed that he snacks throughout the house.	The patient agrees to eat at one specific place at home.

Changing Eating Habits: Guide for Patients

Suggestion	Why It's Important	What May Happen
Identify the emotions that are connected with your eating. Do you eat when you're bored, nervous, or angry? Or do you eat when you are happy or excited?	Emotions often play a role in overeating, directly or indirectly. Eating may be a conditioned response to a certain emotion.	You may find that you eat when you are angry: Anger (cue) → eating (behavior) → feeling soothed (consequence).
Eat slowly. Put your fork down between each bite and swallow your food before picking up your fork again. Take a 2-minute break at some point during a meal.	It takes 20 minutes for food to be absorbed and your gastrointestinal tract to signal your brain that you've eaten enough.	By slowing down the eating process, you give your body a chance to respond to the food you've eaten. You may feel fuller on less food.
Avoid situations that are obviously tempting.	The sight and smell of food are powerful stimuli to eat. You don't even have to think about these stimuli to be affected. You may be more sensitive to the sight and smell of food than other people.	If you feel like buying a doughnut or roll when you pass a bakery, you can avoid the temptation by understanding why you're tempted. Even better, you can avoid the temptation by taking a different route or crossing the street before you get to the bakery.
Make food less visible at home and at work: ▪ **Store food in opaque containers in the kitchen and refrigerator** ▪ **Remove all displayed food, including candy and nut dishes** ▪ **Replace junk food with low-caloric snacks, such as carrots and celery**	You may be able to cut down on the impulses to eat if food is less visible. In addition, you are introducing conscious decision-making into the process of dealing with an impulse to eat.	In the time it will take to find a snack, you'll have time to ask yourself, "Do I really want it?"
Remove all serving dishes from the table at meals. Keep them out of sight.	Once again, you're eliminating a visual cue to eating. A serving dish on the dinner table is an open invitation to one last spoonful of mashed potatoes.	Instead of being able to just reach for a second helping absentmindedly, you'll have to make a conscious decision to go to the kitchen.
Choose a special place to eat at work or eat lunch in a restaurant.	Eating at your desk can result in having a continual cue to eat.	You may find that you are less tempted to snack during the day. If you must eat at your desk, use a special placemat and utensils to make yourself more aware of eating.
Choose one place to eat in your home. It can be at a table in the dining or family room, but eat all meals and snacks at this place. Be sure to choose an attractive, comfortable place to eat.	Eating in different places throughout your home eventually leads to increased stimuli to eat since so many physical situations are associated with eating.	Your environment for eating may improve. You may become more aware of the eating that contributes to overeating.

Some Abbrevations Used in the Nutrition in Primary Care Series

ATP	adenosine triphosphate
c	cup
cc	cubic centimeter
CNS	central nervous system
FDA	Food and Drug Administration
gm	gram
IBW	ideal body weight
IU	International Units
kcal	kilocalorie
kg	kilogram
lb	pound
lg	large
MCV	mean corpuscular volume
MDR	minimum daily requirement
med	medium
mEq	milliequivalent
mg	milligram
MJ	megajoule
ml	milliliter
oz	ounce
RDA	Recommended Dietary Allowances
RE	retinol equivalents
sl	slice
sm	small
Tbsp	Tablespoon
TPN	total parenteral nutrition
t	teaspoon
USDA	United States Department of Agriculture