WEIGHT REDUCTION IN TWO CARDIAC PATIENTS: A CLINICAL APPLICATION OF VIDEOTAPE REPLAY AND BEHAVIOR MODIFICATION

by

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A FIELD STUDY

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"Health is not a commodity that can be given or bestowed by one individual on another... health is a quality that each individual has to pursue for himself."

Sommers (1973)

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CHAPTER I

INTRODUCTION

Context of the Study

Newer definitions of nursing practice make the utilization of the most recent scientific advances of allied disciplines both an opportunity and an obligation to the individual practitioner. One such advance has been in the technology of closed circuit television which has made it both practical and available. Recent years have also seen a renewed interest in the psychotherapeutic approach known as behavior modification in a variety of disorders. The superiority of this mode has been especially evident in the treatment of eating disorders (Stunkard, 1972). It seems particularly important that nurses know of these developments in that leadership for the use of behavior modification in the treatment of obesity has largely come from the allied disciplines of psychology and social work. The present study will describe a method developed to teach cardio-vascular patients how to change their eating habits and thus lose weight. Videotape replay was used to facilitate the teaching therapy.

The use of closed circuit television in patient therapy and student teaching has been described in the literature. Closed circuit television was used in the rehabilitation of cardiac patients as early as

1965. The therapeutic usefulness of encouraging cardiac patients to express the emotional feelings surrounding their illness was investigated by a group at Duke University (Verwoert, Nowlin, and Agnello, 1965). Schools of nursing have been enthusiastic about the use of closed circuit television particularly in instruction of specialized nursing skills (Quiring, 1972). It would seem reasonable that the next step is for nurses to explore the use of this powerful tool in patient teaching situations.

At the 1972 A. N. A. Convention, Virginia Cleland singled out six goals for the reorganization of the nursing care system. One of these goals was increased utilization by the nursing profession of the behavioral sciences. Cleland states that out of the kind of conceptualization and abstract thinking of nurses who have been involved in this field has come a great deal of nursing theory that has increased the quality of nursing (Cleland, 1972).

The application of operant techniques to nursing problems has been reported by several authors (O'Neil, Whitney, 1966 and Fowler, Fordyce, and Bernie, 1969). The focus of operant learning theory is on observable behavior and environmental events. Thus operant learning theory offers nursing the opportunity to evaluate the effects of specified nursing functions on individual patients. Functional analysis of behavior into its component parts of stimulus, response, and consequences allows for the demonstration of the variables

affecting the individual and his particular problem. A more scientific approach can then be taken in the nurse-patient relationship to solve patients' problems. The operant learning theory also relates well to the newer definitions of nursing function as is illustrated in the 1973 Oregon Nurse Practice Act (Oregon Nursing Association, 1973). It reads as follows:

> The practice of nursing means the diagnosing and treating human responses to actual or potential health problems through such services as identification there of health teaching, health counseling and providing care supportive to or restorative of life and well being and executing medical regimens prescribed by a licensed or otherwise legally authorized physician or dentist.

Primary responsibility for the prevention and treatment of obesity would appear to be an appropriate function for nursing and one that has not been fully recognized. Perhaps one reason has been the heretofore predominant view that overeating was only a symptom of a deeper disturbance and thus treatment should consist of a complete restructuring of the personality (Kaplan and Kaplan, 1957). Therapy then would be the province of the psychiatrist. Reports in the literature of dieting success or failure have given little attention to specific techniques for changing eating behavior. The role of the nurse in the treatment of obesity in the past has been that of helping the patient to understand and carry out the doctor's diet order and influencing the patient in his family's food choices through an educational approach.

The public health nurse has also used her knowledge of nutrition to observe community nutrition problems closely and has used this information to evaluate family or individual food habits and again through diet education to correct the eating choices (Mitchell, Rynbergen, Anderson, and Dibble, 1968). The learning theory approach to the problem of obesity would neither focus on overeating as a symptom of an underlying emotional problem nor as a problem that could be corrected through an intellectual approach. Operant learning theory focuses on overeating as a learned behavior, acted out in response to specific environmental cues and maintained by its immediate consequences.

The choice of the therapy of behavior modification has social and moral implications. It is declared by its advocates as "a highly advanced science as rigorous as any part of biology dealing with the organism as a whole" (Skinner, 1973, p. 26). Opponents to the behavioristic approach suggest, however, that manipulation of the environment regards man as a kind of automaton, without free will, or simply, as a manipulated object. B. F. Skinner has responded to this criticism by saying:

> I simply ask my reader to consider the possibility that human behavior is always controlled, and by conditions which we are slowly coming to understand. As I have noted, control does not mean physical restraint or manipulation in the etymological sense. The behavioral scientist simply changes the environment in such a way that behavior

> is changed. The literature of freedom and dignity has not been concerned with freeing man from control but merely changing the kind of control (Skinner, 1973, p. 263).

In changing the "kind" of control, Skinner refers to changing the predominantly negative control that has conditioned the problematic behavior. Positive reinforcement is then scheduled to maintain a positive behavior change.

In summary, operant learning theory was seen to offer nurses the opportunity to become more effective practitioners in the prevention and treatment of one of the major health problems today, obesity. By becoming behavioral engineers, they could then effectively lead individual patients through a problem solving system to change eating habits and restore more optimum health. In addition, closed circuit television would be explored as a tool to promote the patient becoming a keen observer of his own behavior.

Scope of the Problem

Introduction and Definition

Overnutrition is a major problem in the developed countries of the world today and obesity is its clearest manifestation (Salans and Wise, 1970). Overweight is defined as body weight in excess of an ideal weight, based on height- and sex-specific standards. Overweight can result from excess accumulation of bone, muscle, fat,

or more rarely, fluid. Almost everyone who is more than 20 percent overweight is also overfat, or obese (Dwyer, Feldman, and Meyer, 1970). Tables of height- and sex-specific standards are limited in their ability to accurately describe the amount of individual adiposity; therefore, these tables are used as a guide rather than exact values.

Prevalence

There are no statistics for the general prevalence and incidence of overweight and obesity in the total population. However, some sources have provided data on some populations. Statistics from the U. S. Public Health Service indicate that over half of all adult men and 40 percent of all adult women are overweight (Jolliffe, 1962). The most recent available data concerning the incidence of overweight persons in specific age groups is presented in the following table.

Table 1. Percent of Males and Females Overweight in Certain Age Groups in the General Population.

Age (years)	Males Overweight		Females Overweight	
	10%	20%	10%	20%
	(in percent)			
20-29	19	12	11	12
30-39	28	25	16	25
40-49	28	32	19	40
50-59	29	34	21	46
60-69	28	29	23	45

Note: Adapted from Metropolitan Life Insurance Co., New York. Frequency of overweight and underweight, Statistical Bulletin 41:4, Jan. 1960.

The effect of this widespread problem on individual health is significant. Actuarial tables show a negative correlation between overweight and longevity. Mortality in 15 to 69 year old men was shown to be one-third greater in those who were 20 percent or more overweight, than in those considered "standard risks." Among men 10 percent or more overweight, mortality was one-fifth greater. Overweight women have somewhat lower excess mortality rates.

The conditions associated with the excess mortality of men 20 percent or more overweight are, in the order of their frequency: diabetes, diseases of the digestive system, cerebral hemorrhage, and heart disease. In women, heart disease displaces diseases of the digestive system in the order of diseases associated with excess mortality (Statistical Bulletin, Metropolitan Life Insurance Co., 1960). Moriyama, Krueger and Stamler (1971) report that excess mortality in individuals who are obese and have cardiovascular disease is as high as 43 percent for men and 51 percent for women.

Conversely, weight reduction has been shown to have a favorable effect on longevity. The rate of mortality has been shown to go down after excess weight has been lost. The following figure shows that the rate of mortality for the insured policyholders who reduce their weight fall well below that for the entire group of overweight policyholders from which they are drawn.

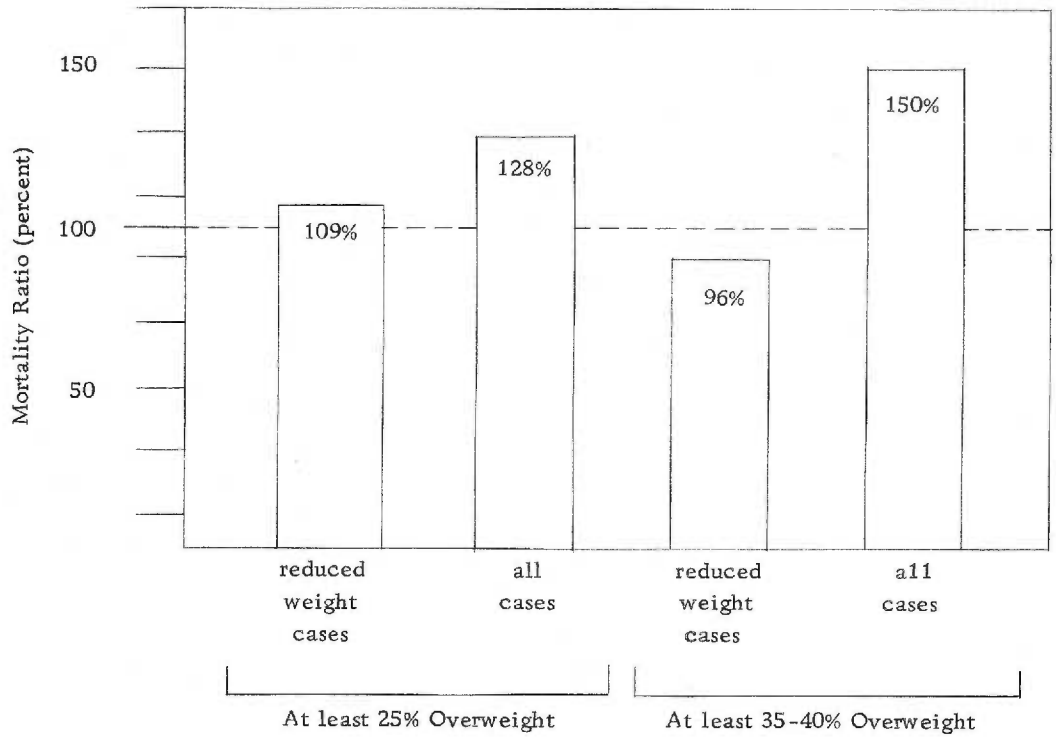

Figure 1. Mortality of overweight men subsequent to weight reduction and to all overweight men.

NOTE: Adapted from Statistic Bulletin, Metropolitan Life Insurance Co., 41: March, 1960.

Some medical researchers have found that in obese persons there are at least transitory abnormalities of almost every body function (Solomon, 1971). Noteworthy are the correlations between excess weight and the development or adverse effect on hypertension, stillbirth and complications of pregnancy, diabetes mellitus, gall-bladder disease, gout, respiratory difficulties, kidney disease, glandular dysfunction and malnutrition. Surgical risk is increased significantly by obesity.

As a focus for the present study it became apparent to the investigator that for one segment of patients, the cardiovascular group,

loss of weight is not only desirable but an absolute necessity. For this reason an investigation was carried out to determine the need in this particular group of patients. A clinic at the University of Oregon Medical School that deals exclusively with the evaluation of cardiovascular patients (CVE Clinic) was chosen for the investigation.

The total population of 1,038 patients followed by the Cardiovascular Evaluation Clinic was divided into four groups. Group A consisted of those patients with a diagnosis of atherosclerotic heart disease (ASHD), including those who had had surgery (272 patients). Group B consisted of those patients with a diagnosis of valvular disease (VHD), again including those who had had surgical repair (612 patients). The third group, Group C, contained those patients diagnosed with congenital defects (CHD) (138 patients). The remaining small number of patients diagnosed with rheumatic heart disease without valvular dysfunction, aneurysms and ideopathic cardiomegaly were not included in the study. A random sample was drawn to study from the total population. The latest weight recorded on the medical record of thepatients included in the sample was compared to the mean desirable weight for age, height, and sex reported in the 1969 U. S. Department of Agriculture Table for Desirable Weights. Results of this study are shown in Table 2.

Table 2. Percentages of Patients Underweight, Average Weight and Overweight Followed by the Cardiovascular Clinic.

Group	Underweight		Normal	Overweight	
	20%	10%	+, -10%	10%	20%
			Atherosclerotic Heart Disease		
A N=27	0	0	56	15	29
			Valvular Heart Disease		
B N=61	2	8	46	23	21
			Congenital Heart Disease		
C N=14	0	0	35	29	35.5
Totals	.7	2.7	45.8	22	28.5

The incidence of overweight in the male population of the CVE clinic (Table 3) reflects that found in the general population (Table 1). The largest number of overweight males was also found in the age group most often affected by heart disease. More overweight males were found in the after-40 age group than in the general population. The present study also indicates an increased incidence of overweight (10 percent or more) in the male population 20-29 years of age. The mean age for each group was: Group A (ASHD), 54.4 years; Group B (VHD), 46.7 years; and Group C (CHD), 38 years. Thus, the larger number of overweight males in the younger population were shown to be found in the CHD group. In females, incidence of excess weight in all categories is markedly above the incidence of overweight in the general population.

Table 3. Percent of Males and Females Overweight in Certain Age Groups in the CVE Clinic.

Age	Males Overweight		Females Overweight	
	10%	20%	10%	20%
		(in percent)		
20-29	50	20	33.3	33.3
30-39	0	0	38	23
40-49	44	44	79	44
50-59	40	20	42	15
60-	45	27	50	35.5

Psychological Impact of Obesity

In addition to the physiological dysfunction caused by the excess accumulation of fat, obesity is important because of its psychological effect. Obesity has been described by the American Psychological Association as the most neglected physical disability today. One physician author states that even physicians appear to have a "contemptuous regard" for the obese (Kurland, 1970). Mass media and advertising reflect the ideal of a slim, attractive physique. Little wonder overweight persons report feelings of shame, inadequacy, inferiority and guilt. Patterns of behavior are established that maintain and perpetuate the individual's problem with weight states Korman (1972). These behaviors include: never take your coat off, avoid turnstiles, reduce activity and social contacts, never eat in

public, avoid running, and always say, "I am losing weight" (Korman, 1972).

Statement of Problem

The scope of the problem of obesity is of such proportions that it is a cause for genuine concern. Life insurance studies indicate that those who are overweight run a greater risk of illness and early death than those of desirable weights. Overweight persons who reduce their weight increase their chances for a longer life. As a focus for the present study the investigator determined that there existed a marked increase in excess weight in the CVE clinic segment of cardiovascular patients than existed in the general population. Psychological problems allied with obesity include social isolation and embarrassment. Unfortunately for the overweight person, societal influences act to maintain problematic behaviors.

CHAPTER II

PHYSIOLOGICAL ASPECTS

Mechanisms of Fat Storage and Mobilization

Introduction

To more adequately assess therapeutic programs for weight loss and to meet patient needs, this investigator found it helpful to review the physiological processes involved in the accumulation of fat. For those who may also be interested in this information, a description of the mechanisms involved in the storage of lipid in fat cells and the mobilization of lipid from the fat cell back into the blood stream is included. The roles played by body build and internal and external regulatory mechanisms are also discussed briefly.

Fat Cells

Obesity is a matter of energy balance. A dysequilibrium must exist for obesity to develop and to be maintained. This is always the result of taking in more calories from food stuffs than is burned up in energy expenditure. The cell content of the adipose cells and the number of fat cells an individual has are both influenced by this chronic process of overeating. However, in some forms of human

obesity, inherited or acquired abnormalities of adipose cell function may magnify even a relatively small caloric imbalance (Seltzer, 1972).

Adipocytes are derived from connective tissue cells, the number of cells formed being related to feeding during late gestation, in the first year of life and perhaps in early adolescence (Hirsh, 1972). Once adipose cells are formed the number of cells remains constant, only the size of the cells change.

The essential feature of the adipose cell is its massive content of neutral lipid. Eighty percent of the liquid weight of the fat cell is lipid; water contributes 17 percent and small amounts of glycogen, protein, nucleic acids; and other organic substances make up the remainder. Over 95 percent of the lipid content is triglyceride. The lipid that is stored in the adipocyte comes from two sources; the circulating plasma triglyceride and from the synthesis of fatty acids from glucose.

Storage of Fat

The transfer of the circulating plasma lipid into the adipose cell is described by Hallenberg and Angel (1972) as being accomplished through a series of enzyme catalyzed reactions. The transfer takes place in four steps: (1) the hydrolysis of the lipoprotein triglyceride by a specific lipase synthesized by the adipose cell; (2) transport of the released fatty acid into the cell; (3) esterification of these fatty

acids, reforming triglyceride; and (4) storage of the triglyceride molecule in the storage vacuole.

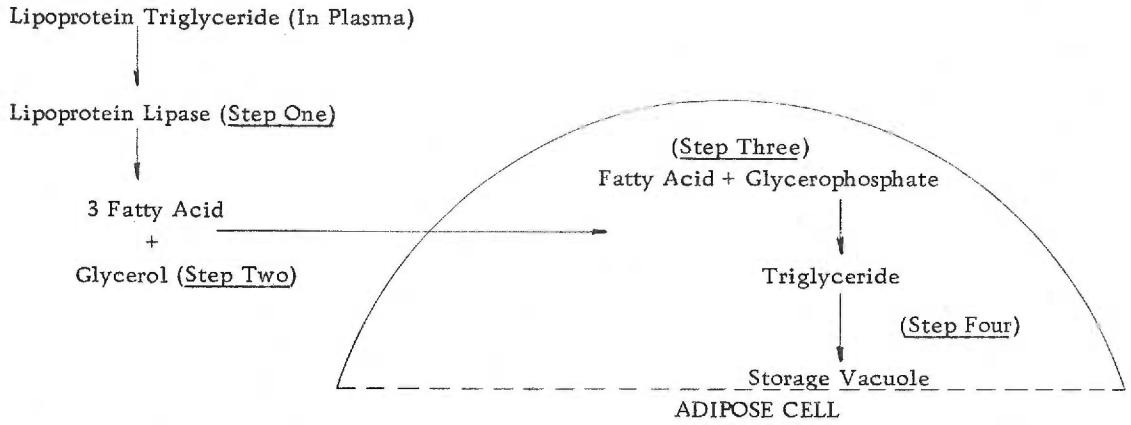

Figure 2. Storage of lipid in the adipose cell from circulating triglyceride.

NOTE: Figures 2-7 adapted from Hollenburg and Angel, Adipose Tissue Metabolism, Med. Clinics No. Am. 56:1083-1094. 1972.

The ability of the glycerol to accept fatty acids in ester linkage (step four) occurs only when the phosphorylated derivative of glycerol, glycerophosphate, is available. In a fat cell, glycerophosphate must be derived almost entirely from glucose. Thus the rate of glucose metabolism in the adipose cell determines the rate that glycerophosphate is generated.

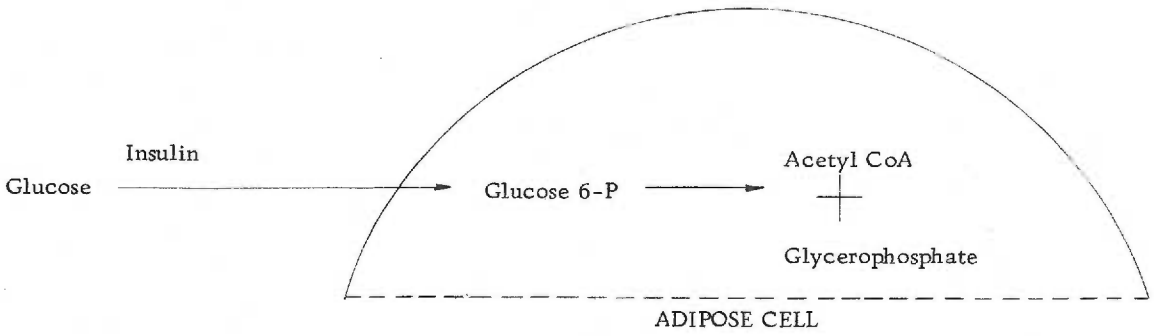

Figure 3. Glycerophosphate for esterfication of fatty acids by the fat cell must be derived from glucose metabolism in the fat cell.

The second mechanism involved in lipid accumulation in adipose tissue involves the in-cell synthesis of long-chain fatty acids from glucose. Insulin augments the entry and the utilization of glucose, the metabolism of which results in the production of acetyl Co A which is then incorporated into long-chain fatty acids. The fatty acids are then esterified with glycerophosphate forming triglyceride that is transferred to the storage vacuole.

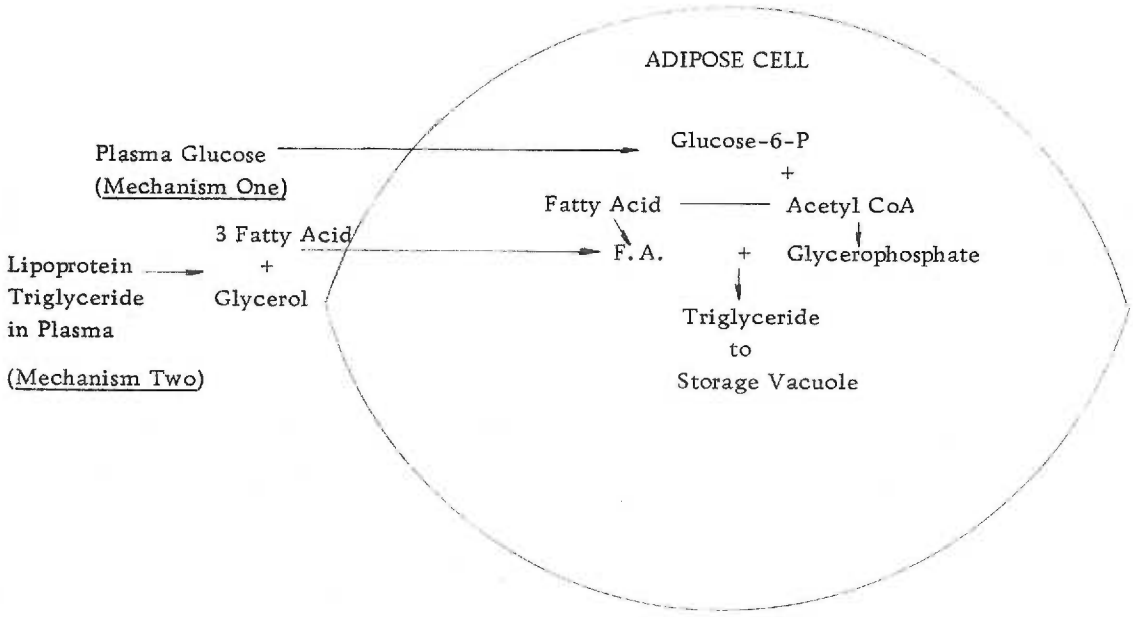

Figure 4. Plasma triglyceride transfer to stored triglyceride (Mechanism One).

The manufacture of glycerophosphate derived from glucose metabolism resulting in in-cell synthesis of triglyceride from the long chain fatty acids derived from glucose metabolism (Mechanism Two).

Both of the above processes for the storage of triglyceride (lipid) in the fat cell are markedly affected by a decrease in calorie intake. For instance, not only does fasting lower the uptake of glucose by the adipose cells, thus decreasing fatty acids and

glycerophosphate synthesis, it may also reduce the rate of the incorporation of the circulating plasma triglyceride by a decrease in the production of the lipoprotein lipase that is produced by the adipose cell needed for the hydrolysis of the plasma lipoprotein.

Mobilization of Fat Cell Content

The physiological problem then in weight reduction, or adipose cell size reduction, becomes how to mobilize the stored lipid from the adipose tissue. It is known that during periods of insulin deficiency brought about by calorie deprivation or under the influence of a variety of hormones, stored lipid is converted to a form that passes out of the adipose cell and is available to other cells as a source of energy. The lipid released from the adipose cell is in the form of free fatty acids and once released is bound to plasma albumin and can readily be extracted by a variety of tissues.

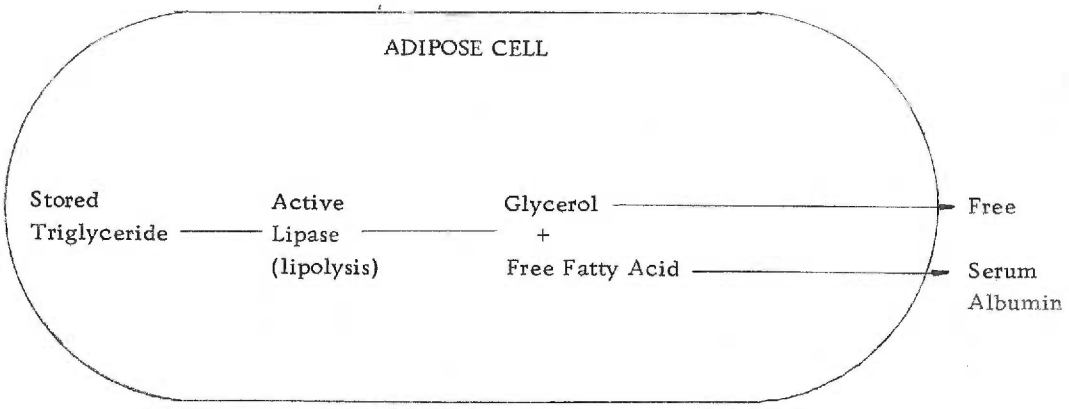

Figure 5. Mobilization of stored triglyceride by lipolysis to free fatty acids which then become bound to albumin molecules in the serum.

The adipose tissue lipase that catalyzes the lipolysis consists of triglyceride lipase and a monoglyceride lipase. Although all the exact mechanisms are not yet known about the many hormonal influences, the activity of the triglyceride lipase has been shown (Hollenberg and Angel, 1972 and Salans and Wise, 1970). Triglyceride lipase can become activated when exposed to critical concentrations of a derivative of ATP called 3'5' adenosine monophosphate or cyclic AMP. It is known also that epinephrine and norepinephrine, catecholoamines, ACTH, and growth hormone have an effect on the activity of adipose tissue triglyceride lipase and thus have lipid mobilization properties.

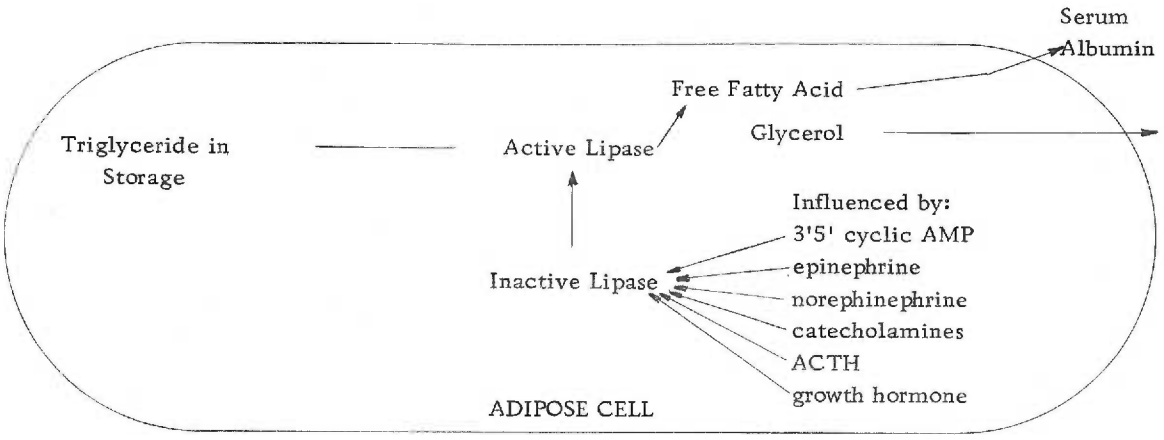

Figure 6. The hormonal influence on the activation of triglyceride lipase.

Another mechanism regulating the plasma concentration of free fatty acids is the re-esterification of the free fatty acids to glycerophosphate in the adipose tissue where it would then be returned to

storage. Thus there are two opposing reactions, the hydrolysis of triglyceride and the re-esterification of the fatty acid products of hydrolysis.

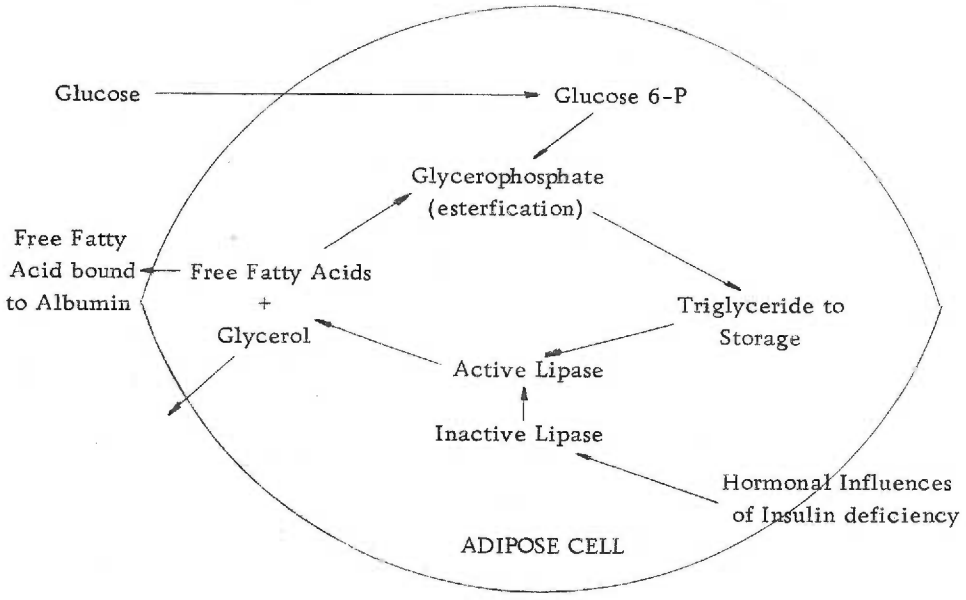

Figure 7. Mechanism for the mobilization of triglyceride from storage to the serum for availability to other tissues and the opposing reaction that would return the free fatty acid to storage through its re-esterification.

The flux of the lipid across the adipose cell has great importance to the overweight individual who can regulate these mechanisms by what and how much food stuffs he eats. The effect of a high carbohydrate intake is to: (1) increase insulin levels and to decrease concentrations of plasma growth hormone. Plasma triglyceride is then assimilated into fat cells by activation of lipoprotein lipase and rapid generation of glycerophosphate from glucose. These mechanisms greatly influence the accumulation of lipid in the adipose cell.

(2) Increased glucose intake accelerates fatty acid synthesis and further increases lipid storage in fat cells. (3) Fat mobilization is inhibited by the inhibiting effect of an increased concentration of insulin on the triglyceride lipase with the rapid production of glycerophosphate leading to the esterificationof the free fatty acids and re-storage of the triglyceride into the storage vacuole. (4) Low levels of growth hormone reduce this hormonal influence on triglyceride lipase, again reducing lipid mobilization. The sum of the influence of a high carbohydrate, high glucose diet is to facilitate the accumulation of lipid in the adipose cells, thus increasing the mass of adiposity.

Fasting or reducing caloric intake has the effect of mobilizing lipid from the adipose storage vacuole or to prevent its accumulation: (1) tissue lipase is stimulated by rising concentrations of growth hormones increasing lipolysis; (2) re-esterification of the free fatty acids in fat cells is reduced by reduction in glycerophosphate; (3) assimulation of plasma triglyceride is reduced by low lipoprotein lipase activity and by limited production of glycerophosphate; (4) the rate of in-cell synthesis of fatty acids is lowered by a reduced rate of glucose entry into the adipose cell. The sum effect is a decrease in size or contraction of the adipose cell and a reduction in the mass of adiposity.

Obesity and Body Type

The obese differ from the non-obese in morphologic characteristics other than the degree of adiposity. Adult obese women and obese adolescent girls were found to have a remarkably similar body build or somatotype. Apart from their excess adiposity, the obese were considerably less ectomorphic, and more mesomorphic than the comparison groups of "normal" populations (Seltzer and Mayer, 1969). Anthroporphic somatic ratings are made in terms of three basis components: endomorphy, mesomorphy, and ectomorphy. Endomorphy rates softness and roundness; the obese rate very high on the component of endomorphy. Mesomorphy describes a combination of bone and muscle development, and is rated strongly in the obese indicating a bone-muscle mass above average development. What is striking in the obese is the extremely low degree of ectomorphy, the component describing linearity, fragility, and attenuation. It is also reported that obese men and women have greater anterioposterior chest dimensions. Seltzer and Meyer (1969) state that, "There appears to be a fundamental relationship between body build and obesity apart from the accumulation of excess fat" (p. 458).

Regulation of Food Intake

The question arises, then, what leads this predominately endomorphic-mesomorphic individual to consistently take in more foods or the wrong kinds of food stuffs to maintain the thermodynamic disequilibrium. In the non-obese "normal" population weight remains fairly constant. This leads physiologists to surmise that a regulatory mechanism exists within the brain to maintain the balance between caloric needs and caloric expenditure, so that body weight remains within normal limits (Debons and Krimsky, 1972).

> The regulation of food intake appears to be complex, resting on cerebral and extracerebral components. An essential component is a pair of centers situated in the ventromedial area of the hypothalamus which act as satiety "brakes" on more lateral symmetric centers that apparently are otherwise constantly activated (Meyer, 1960, p. 66).

The hypothalamus is located at the base of the skull, near the pituitary gland. The lateral area facilitates feeding by reflexes promoting feeding: contractions of an empty stomach, a cold environment, and a lowered blood sugar; while the medial area inhibits such reflexes. Mayer (1960) and his associates have demonstrated that glucose receptor cells appear to be activated in the ventromedial area that inhibit feeding. Other inhibiting influences signaling sufficiency of food intake include distention of the stomach, a warm environment, medications such as amphetamines, dehydration and

exercise. Many of the mechanisms of amphetamines and exercise are not well understood. The mechanism of the cerebral component, emanating from the frontal lobes of the cortex, for instance in the case of stomach distention, is the connection via the vagus nerve and medulla with the stomach.

Hunger may be described as a desire to eat based largely upon physiological reactions to food depletion (Kaplan and Kaplan, 1957). However, this is only part of the mechanism involved in food intake. It is known that hunger sensations arising from an empty stomach are not an absolute requirement for the existence of a desire to eat. Experimentation has been done showing that food intake is not decreased by cutting both vagi, the splanchnics, or by total or partial gastrectomy. It is also known that decorticated dogs and anencephalic infants will swallow food when it is placed in their mouths (Kaplan and Kaplan, 1957).

The Role of Conditioning

The role of learning or conditioning in connection with physiological and psychological stimuli is beginning to receive more attention in explaining the desire to eat, especially for the obese. The learned desire for food is called appetite. Appetite is a pleasant sensation associated with sights and odors of food, in contrast to hunger, an essential unpleasant sensation of stomach contractions,

irritability and fatigability. It is abnormal appetite, aroused by cortically mediated stimuli such as the sights, thoughts and feelings, that some authors feel is responsible for almost all eating problems, with the exception of those with demonstrated trauma to the hypothalmus and endocrine disorders (Meyer, 1960). It has been postulated that the obese in fact override the regulating mechanism of the hypothalmus. A normal individual who may see food is able to respond from internal cues of not being hungry (it's not time to eat); however, the obese individual disregards internal cues almost entirely and responds to the conditioning. Thus the obese eat in situations associated with boredom, anxiety, watching television, or simply because it is available.

In an effort to determine how the obese respond to food differently than the non-obese, Schacter and his associates examined the existing literature on the behaviors of obese human subjects and animals who had become obese as the result of damage to the central-medial nuclei of the hypothalamus. He terms this the "science of analogy," (Schacter, 1971); interested persons are referred to his paper for the specific information verifying his conclusions. Schacter described twelve similar behavior characteristics in obese humans and rats:

(1) they both eat more good tasting food than "normals";

(2) they eat less bad tasting food;

(3) they eat slightly, not considerably, more than "normals";

(4) they eat fewer meals per day;

(5) they eat more per meal;

(6) they eat more rapidly than do their normal counterparts;

(7) they differ emotionally; are more easily startled, are overemotional, more irritable;

(8) they are markedly less active than their counterparts;

(9) when food is easy to get at, they eat more than "normals," when food is hard to get at fat subjects eat less than "normals";

(10) obese humans and animals choose the easiest way of eating;

(11) they do not regulate food intake but continue to eat even when they are preloaded with solids; but

(12) they do regulate food intake when preloaded with liquids (Schachter, 1971).

Schachter concludes from these observations that eating of the obese seemed unrelated to any internal visceral state, but is determined by external food-relevant cues, such as sight, smell, and taste of food, and its availability.

> For normal humans these factors clearly interact with the internal state to affect what, when, and how much he eats, based on physiological hunger. To the obese, the internal state is irrelevant (Schachter, 1971, p. 143).

He suggests that the obese are "stimulus-bound."

Research has thus shown that adiposity is a complicated problem. It has not answered the crucial question, however, how does the imbalance between caloric intake and energy expenditure, the thermodynamic dysequilibrium, develop in persons? There are at least two fundamental views of why people develop excess fat. They differ in important ways. Meyer and others look at adiposity as being, in most cases, an internally controlled, physiological phenomenon (Meyer, 1968 and Solomon, 1971). Schachter suggests that the obese person is controlled by food related stimuli and relies on sensory information rather than internal signals (Schachter, 1971). Whoever is right, adiposity remains a fundamental problem of surplus energy. This surplus energy, states Meyer, can only build up in three ways: (1) one eats more than a normal amount of food; (2) one eats a normal amount, but doesn't get enough exercise to burn up the energy that he takes in; (3) or one has a metabolic disorder which speeds up the rate at which his body accumulates fat tissue or slows down the rate at which his body mobilizes fat, or both (Meyer and Thomas, 1973). (Metabolic disorders account for only a very small percentage of obesities. They are left out of this discussion for that reason, not because they are not important. The reader is referred to Meyer, 1968 or Solomon, 1971, for more information on specific metabolic disorders).

The Cardio-Respiratory Problem in Obesity

Introduction

The focus of the present study was upon patients who had been diagnosed as having a cardiovascular problem. For this reason the significance of excess adiposity on the cardio-respiratory system was also reviewed.

Excess adipose tissue is frequently associated with cardio-respiratory problems that range from minor symptoms to full blown cardiac failure. Eighty-four percent of the obese have dyspnea and some degree of orthopnea. Many have periodic breathing, especially when asleep. Fifty percent of the obese report somnolence and narcolepsy. Plasma volume is frequently increased in that the fat deposits and the blood supply to this extra tissue is sufficiently large to necessitate a high cardiac output even at rest (Wilson and Wilson, 1969).

The Respiratory Problem

Successive changes in pulmonary function are progressive as adiposity accumulates. Plethora, hypoxia, and diminished lung volume are relatively early signs of the increased work of breathing. Hypercapnia and pulmonary hypertension appear later and in the more morbid cases of obesity. The increased work of breathing is the

result of a reduction in the compliance of the extrapulmonary structures, the thoracic cage, the diaphragm, and the abdominal wall, rather than any intrinsic lung pathology. There is concomitantly an increased frequency of breathing and a reduced tidal volume. Arterial hypoxia is present in approximately two-thirds of all patients with simple obesity (Cherniack, 1972). The compliance of the respiratory system is reduced even more in the obese individual when in a recumbent position and gives rise to symptoms of orthopnea. The increased body mass also requires an increase in oxygen consumption and carbon dioxide production. These requirements are met with an increase in the minute ventilation, cardiac stroke volume, and cardiac output.

The exact mechanism that results in the underventilation of the lung and the increased cardiac output is not agreed upon by all authors. It has been postulated that the control system in the medulla that maintains the arterial pCO_2 at about 40 mm Hg. in normal individuals, is affected by the prolonged increased concentrations of CO_2 in the underprofused lung and leads to a diminished sensitivity of the respiratory center potentiating the hypoxia and hypercapnia.

The Vascular Problem

The mechanisms underlying the often enlarged heart associated with the obese are also undefined. Chernick (1972) suggests that

since hypoxia results in pulmonary vasoconstriction, it might be expected that the resultant increase in pulmonary vascular resistance could play a role in the increased size of the heart. Alexander (1966) also states he believes that in

> grossly overweight individuals the myocardial hypertrophy and reduced ventricular compliance derive largely from the increased cardiac work load resulting in a rise in left ventricular filling pressure and pulmonary hypertension. Later, as progressive hypertrophy itself compromises myocardial contractility and the work load of the heart remains augmented, cardiac failure supervenes (Alexander, 1966, p. 1411).

Many of these manifestations disappear with weight reduction and are therefore assumed to be related to obesity. However, there are no correlations between severity of symptoms and the amount of excess weight or between the severity of symptoms and the extent to which the cardiorespiratory system is compromised. The added stress of an increased work of breathing and increased the work load of the heart on an already compromised cardiorespiratory system can then be seen as the very serious health problem that it is.

Obesity and Hypertension

The occurrence of a large amount of adiposity is also known to contribute to other high risk factors in heart disease. Among these is hypertension. The reduction of weight in hypertension of even a

modest amount results in a fall of blood pressure often to normal levels (Robinson, 1972; Alexander, 1966).

Dietary Problem

The relationship between the dietary ingestion of cholesterol and triglycerides and its effect on the cardiovascular system was also a consideration in the selection of patients for this clinical trial. As it is well known, the atherosclerotic process that gives rise to coronary heart disease has a causal relationship to an increased level of cholesterol in blood plasma. The Framingham Heart Study showed that adiposity characterized the young Framingham male with coronary heart disease and was directly correlated with angina pectoris, coronary insufficiency, and sudden death, even though no direct relationship was found between obesity and myocardial infarction (Damon, Damon, Harpending, and Kannel, 1969). The progressive accumulation of cholesterol-containing fatty material on the inside surfaces of the blood vessels results in the narrowing and loss of compliance of the affected vessels. The amount of lipid material deposited is in proportion to the circulating lipids in the plasma. Of importance, too, is the amount of cholesterol produced in the body in response to a high blood glucose level. Dietary adherence to a low cholesterol, well balanced diet and the inclusion of

exercise are of known benefit in the reduction of cholesterol levels in the blood.

Exercise

In answer to the question, what are the two most important things I can do to prevent a heart attack, Dr. Neil Solomon states that exercise and the relief of undue stress are very important factors in the prevention of heart disease (Solomon, 1971). Exercise has been shown to improve carbohydrate metabolism and cut down cholesterol levels in the blood. Although body weight has not been shown to be significantly affected by exercise (Stuart, 1972); daily exercise will alter the body form, increasing muscle mass and decreasing body fat. More exercise can then be taken, and physical fitness increased. Mortality rate has been reduced about 50 percent in patients who have coronary heart disease and have become physically fit (Solomon, 1971). Large amounts of unusual exercise have accounted for deaths, however (Cooper, 1970) and exercise programs should be increased slowly and carried out under medical supervision.

Summary

A review of the physiological stress on the "normal" individual who is also obese brings into sharper focus the stress upon the

already compromised cardiovascular system of the cardiac patient. An increased work of breathing is concomitant with an increased work load of the heart. Hypertension, a high carbohydrate diet, and lack of exercise are commonly associated with obesity and further contribute to the cardiovascular problems.

It would appear to this nurse investigator that the obese cardiovascular patient population would be an appropriate focus for the present study. Also, the theoretical and clinical background of a nurse would appear, to this investigator, to be a particular asset in dealing with the dietary and exercise considerations peculiar to the cardiac patient.

CHAPTER III

TREATMENT APPROACHES: A REVIEW OF LITERATURE

Current Therapeutic Approaches to Treatment

The next issue undertaken was to review current literature regarding the treatment of obesity. The literature written during the most recent five-year period was chosen to include in a summary and is presented in Table 4. Representative studies from this summary of current therapies are included in the following narrative.

Table 4 indicates that there are several modalities of therapy available that appear to be relatively successful in effecting weight loss. Efficacy of treatment modes are shown in case studies and experimental studies. Experimental studies include specific treatment modes versus no treatment controls and focus treatments in comparison to other recognized treatment modalities. The relative success of treatment must also be judged by its ability to effect continued long term weight loss or maintenance. Charles Ferster and his associates (1962), pioneers in the treatment of obesity consisting of self-control of eating, suggest that long-term maintenance is the central issue of a treatment modality (Ferster, Nurnberger, and Levitt, 1962).

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Variables	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	DRUG THERAPY											
Roginsky, M.S. & Sandler, J. 1968	E_1 Phenformin, 50 mg. + 1000 calorie diet	14	NR	16.8	E_2 Placebo + 1000 calorie diet	13	NR	11.5	5 wks.	**Difference between $\bar{X}$ of two groups not statistically different (p=0.09)	NR	
Lawson, A.A., et. al. 1970 Study (1)	E_1 Fenfluramine 80 mg. daily + 1000 calorie diet	10	NR	11.4	E_2 Metformin 3.0 gm. daily E_3 Metformin 1.5 gm. daily E_4 Placebo	10 12 11	NR NR NR	4.4 7.9 4.8	8 wks.	**E_1 significantly more effective than E_2, E_3, E_4 ($p<0.05$, $p<0.001$, $p<0.001$) E_3 significantly more effective than E_2 ($p<0.02$) E_2, E_3, E_4 did not differ	32 wks.	E_1 Treatment effect still evident
Study (2)	E_1 Fenfluramine 80 mg. daily + 1000 calorie diet	18	18	5.3	E_2 Control 1000 calorie diet (Cross-over design)	18	18	1.76	11 wks.	**E_1 significantly more effective than E_2 ($p<0.05$)	NR	
Noble, R.E. 1971	E_1 "Diet Game" + diethylpropion (Tenuate^R)	33	28	4.21	E_2 "Diet Game" + Placebo	33	28	2.0	6 wks.	**Chi square analysis E_1 achieved a significant effect (p .05)	NR	

F U *Indicates follow-up*
NR *Indicates not reported*
* *Indicates grossly obese, usually at least 100 pounds over ideal weight*
II *Indicates data tested for statistical significance*

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	X wt. loss per subject Pounds	Variables	N	Completed N	X wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	DRUG THERAPY Cont.											
Asher, W.L. & Dietz, R.E. 1972	E_1 Diet Pill Group a. Digitalis Group b. Thyroid Group c. Amphetamine Group	1409	NR	NR	E_2 Food Plan	1269	NR	NR	14 wks.	**E_1 significantly more effective than E_2 Greatest losses occurred in E_1a. E_1: 38% lost more than 20 lbs. 10% lost more than 40 lbs. E_2: 24% lost more than 20 lbs. 5% lost more than 40 lbs.	NR	
Freund, J., et al. 1972	E_1 Dextroamphamine (Dexadrine)	32	29	4.6	E_2 Placebo	32	24	2.1	4 wks.	**E_1 significantly more effective than E_2	4 wks.	Treatment effect maintained. Showed variation in physician effectiveness.
Lele, R.D., et al. 1972	E_1 Fenfluramine (Ponderax)	36	21	5.3	E_2 Placebo (Cross-over design)	NR	NR	.3	4 wks.	**E_1 significantly more effective than E_2	NR	

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Variables	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	DRUG THERAPY Cont.											
McClure, C.W. & Brusch, C.A. 1973	E_1 Appetite Control Plan: glucose + benzocaine, caffeine, vitamins in the form of hard candy	62	53	12.1	E_3 Dextroamphetamine sulfate (Benzedrine)	62	25	8.5	4 wks.	E_1 lost 2x all other groups put together	5 mos.	E_1 cont. to lose an aver. of 2.2 lbs. per week
					E_4 AYDS ®Campan. (over counter appetite suppressant)	62	19	4.33		E_1 lost 2x E_3		
					E_5 Willpower: 800-1200 calorie diet	60	9	4.4		E_1 lost 3x E_4		
	E_2 Control: same as E_1 but containing no active ingredients except glucose	62	32	4.63						E_1 lost 6x E_5		
	THERAPEUTIC STARVATION											
Gilliland, I.C. 1968	E_1 Therapeutic fast, 14 days; 600-800 calorie diet, 16 days	46	44	17.2	None				14-16 days		2 years	50% returned to initial wt. 24% continued to lose wt. 26% were eratic in wt. loss.
Hermann, L.L. & Iverson, M. 1968	E_1 Therapeutic fast, 10 days	72	NR	NR	None				10 days	(Complications: edema in 25% due to potassium depletion, and hyperalderonism)	5 years	80% gained more than 40 pounds 7% maintained wt. loss 13% lost more than 40 lbs.

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Variables	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	THERAPEUTIC STARVATION Cont.											
MacCuish, et al. 1968	E_1 Therapeutic fast, average 25 days	25	23	26.7	None				10-40 days		14 mos.	100% returned to initial wt.
Swanson, D.W. & Dinello, F.A. 1969, 1970	E_1 Therapeutic fast, 8-85 days, then 600-1000 calorie diet	*25	17	67.	None				Ave. 38 days	(Complications: 1 pt. developed a paranoid psychosis during fast, others reported psychological turmoil.)	1-50 mos.	56% regained or exceeded pretreatment wt. in 1 yr. 16% achieved some success. 28% dropped out of treatment.
Maagoe, H. & Mogensen, E.E. 1970	E_1 Complete starvation, 10 days; then 800-1000 calorie diet. (9 Pts. repeated fast 1-5x)	46	43	22.7	E_2 Without starvation, conventional methods	31	29	23	10 days -7 mo.		20 mos.	E_1 no more effective in long term follow-up than E_2
Rooth, G. & Carlstrom, S. 1970	E_1 Therapeutic fast, ave. 14-110 days. Some received 0.5 l. milk or 100 gms. lean milk daily.	20	NR	95.2	None				1-7	(Side effects: loss of hair, 4 pts., metabolic acidosis, 1 pt., polyneuritis, 1 pt., amenorrhea, 1 pt.)	5-19 mos.	$\bar{X}$ wt. gain 53 lbs.
Munro, J. F., et. al. 1972	E_1 Therapeutic fast to within 25% of ideal wt. in rehab. center.	25	12	NR	None				NR	12 pts. were able to finish the treatment.	2 yrs.	8 pts. maintained wt. loss 4 pts.gained wt.

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	N Completed	$\bar{X}$ wt. loss per subject Pounds	Variables	N	N Completed	$\bar{X}$ wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	THERAPEUTIC STARVATION Cont.											
Sievers, M.L., et. al. 1972	E_1 Medically supervised fast 2-3 wks. + 1500 calorie diet (Indian population, minimal care unit)	71	51	22.0	E_2 Conventional management: (dietary instruction)	51	NR	+ 1.0	2-3 wks.		Ave. 64 mos.	E_1 45% had a wt. loss of 20 lbs. or more. E_2 18% had a wt. loss of 20 lbs. or more.
	SURGICAL INTERVENTION											
Braasch, J.W. 1971	E_1 Jejunioleal shunt (11 inches of jejunum to 11 inches ileum)	*1	1	100	None				1½ yrs.		NR	
Buchwald, H. & Varco, R.L. 1971	E_1 Jejunoileal shunt, bypass of more than 90% of the small intestine	*1	1	30	None				3 mos.	Lost 31 lbs. at the rate of 10 lbs. a mo.	NR	
Salmon, P.A. 1971	E_1 Jejunocolic shunt, bypass of all but 60 cms. of the small intestine	*120	97	NR	None						6 wks. to 3½ yrs.	63% of patients attained wt. loss to within 20 lbs. of ideal wt. Mortality: 5 deaths

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Variables	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	SURGICAL INTERVENTION Cont.											
Payne, J.H. et.al. 1973	E_1 Jejunocolic shunt Jejunoileal shunt	* 12 *153	156	10.95	None				1 yr. 2 yrs. 3 yrs.	$\bar{X}$ wt. loss 8.10 lbs $\bar{X}$ wt. loss 4.6 lbs. $\bar{X}$ wt. loss 2.2 lbs.	4 yrs.	$\bar{X}$ wt. loss 75 lbs. Mortality: 6% 4 pts. required revision due to complications.
Printen, K.J. & Mason, E.E. 1973	E_1 Gastric bypass: excludes the distal 90% of the stomach	*130	124	61	E_2 Gastroplasty: furnishes small gastric pouch with 1.5 cm. greater curvature channel to maintain gastro-intestinal continuity.	56	55	41	6 mos.	E_1 judged more encouraging than E_2	12 mos.	$\bar{X}$ wt. loss 100 lbs.(E_1) $\bar{X}$ wt. loss 53 lbs. (E_2)
										E_1 mortality: 6 pts E_2 mortality: 1 pt.	24 mos.	$\bar{X}$ wt. loss 179 lbs. (E_1)
	TRADITIONAL APPROACH: EDUCATION, DIETARY COUNSELING & EXERCISE											
Kenrick, M.M. 1972	E_1 Exercise program 30 min/day	6	NR	40.3	E_2 Non-exercise Group	6	NR	33.9	6 mos.	E_1: decreased H.R., better recovery rate, greater fat loss	NR	
Lovell, H. 1971	E_1 Nutritional counseling, physician support, some appetite suppressants	617	204	13.9	None				3 mos.	(Study to show long-term effect)	1 yr.	62% maintained wt. loss (31% without appetite suppressants)

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Variables	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	TRADITIONAL APPROACH: EDUCATION, DIETARY COUNSELING & EXERCISE Cont.											
Cormier, A. 1972	E_1 Dietary instruction + 10 min. exercise (group)	20	NR	20	E_2 Individual dietary instruction (material the same as E_1)	22	NR	19.4	3 mos.	Both groups lost wt. 38% lost 20 lbs. or more	NR	
McEwen, H. et. al. 1972	E_1 Counseling by nutritionist, lectures on physiology, metabolism, exercise	44	31	17	None				3 mos.	All pts. lost wt.	3 mos.	18 (57%) cont. to lose 3 (10%) maintained wt. loss 10 (33%) regained wt.
	BEHAVIOR MODIFICATION: AVERSIVE CONDITIONING											
Kennedy, W.A. & Foreyt, J.P. 1968	E_1 Avoidance conditioning	*1	1	30	None				22 wks.	Pt. lost up to 48 lbs. by 13th wk. then increased to a 30 lb. loss at end of treatment. Increase in intake of non-conditioned foods noted.	NR	

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968 -1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	%Completed	$\bar{X}$ wt. loss per subject Pounds	Variables	%Completed N	N	$\bar{X}$ wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	BEHAVIOR MODIFICATION: AVERSIVE CONDITIONING Cont.											
Foreyt, J.P. & Kennedy, W.H. 1971	E_1 Aversive conditioning	6	6	13.3	E_2 TOPS group (control)	6	NR	1.0	9 wks.	**E_1 Achieved a significant effect ($p=0.002$, $p<0.05$)	4 mos.	E_1 $\bar{X}$ wt. loss 9.17 lbs. E_2 $\bar{X}$ wt. gain 1.33 lbs. Not statistically different
	BEHAVIOR MODIFICATION: SELF CONTROL OF EATING											
Wollersheim, J.P. 1968	E_1 Focal treatment: based on operant learning principles	18	18	10.83	E_2 Positive expectations, social pressure E_3 Non-specific therapy E_4 No treatment controls	20 20 18	20 20 18	3.05 9.06 1.06	3 mos.	**Analysis of variance: E_1 treatment effect highly significant ($p<.001$) Duncan's test of post treatment means: E_1, E_2, E_3 differed significantly from E_4; E_2, E_3 did not differ from each other; E_1 did not differ from E_3	2 mos.	E_1 $\bar{X}$ wt. gain 2.0 lbs. E_2 $\bar{X}$ wt. gain 2.0 lbs. E_3: maintained E_4: no follow-up

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Variables	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	BEHAVIOR MODIFICATION: SELF CONTROL OF EATING Cont.											
Harris, M.B. 1969	E_1 Operant techniques: stimulus control, self-monitored continuance of same	8	7	10.5	E_3 No treatment control	8	NR	3.6	10 wks.	**Significant effect between pre- and post-treatment $\bar{X}$ wts. for E_1,E_2 ($t=5.19$, $p < .001$)	6-7 mos.	E_1 E_2 $\bar{X}$ wt. loss 6 lbs.
	E_2 Same as E_1 + subgroup: adversive conditioning	8	7							E_1,E_2 significantly more effective than E_3		
Moore, C. et. al. 1969	E_1 Operant conditioning	1	1	35	None				7 mos.		1 yr.	Maintained wt. loss
Jongman, J.G. 1969	E_1 Behavior Modification	15	NR	NR	E_3 Traditional: diet therapy	15	NR	NR	4 wks.	E_1,E_2,E_3 lost more wt. than E_4	5 mos.	E_1 cont. to lose
	E_2 Same as E_1	15	NR	NR	E_4 No treatment controls	15	NR	NR				E_2, maintained E_1 and E_2 more effective than E_3
Shipman, W. 1970	E_1 Behavior Modification	11	NR	15	E_2 Conventional group therapy	9		NR	NR	**Mean difference between groups not statistically significant. Great variation in E_1 group.	NR	
						9	NR	6.6				

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Variables	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	BEHAVIOR MODIFICATIONS: SELF CONTROL OF EATING Cont.											
Harris, M.B. & Bruner, C.G. 1971	E_1 Self control: operant learning techniques	12	11	7.4	E_2 Contract E_3 Attention: information about nutrition, listening, record keeping	12 8	5 1	13.4 1.5 gain	12 wks.	**No significant differences between pre- and post-treatment weights in any group. E_1,E_2 lost significantly greater percent body weight than E_3 ($p < 0.05$)	10 mos.	E_1,E_2 lost significantly more than E_3 ($p < 0.05$) E_2 tended to loss more than E_1 ($p < .05$)
Penick, S.B. et. al. 1971	E_1 Operant techniques, group therapy E_2 same as E_1	*7 *8	NR NR	24 13	E_3 Supportive psychotherapy diet instruction, appetite suppressants E_4 same as E_3	*17	NR	1.8	3 mos.	**E_1,E_2 significantly more effective for wt. losses over 30 lbs. than E_3,E_4 Fisher exact probability test ($p=0.015$) Wt. loss in E_1,E_2 groups significantly more variable	6 mos.	E_1,E_2 $\bar{X}$ wt. loss 22 lbs. E_3,E_4 $\bar{X}$ wt. loss 15 lbs.
Stuart, R.B. 1971	E_1 Operant conditioning, dietary instruction, exercise	3	3	15	E_2 Diet planning + exercise (Cross over design)	3	3	4 gain	15 wks.	E_1 lost wt. at rate of 1 lbs./wk. E_2 gained wt.	6 mos.	E_1 $\bar{X}$ wt. loss 35 lbs. E_2 $\bar{X}$ wt. loss 21 lbs.

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Variables	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	BEHAVIOR MODIFICATIONS: SELF CONTROL OF EATING Cont.											
Hall, S.M. 1972	E_1 Self-control principles with experimenter controlled	7	6	10	E_2 Experimenter controlled reinforcement (Cross-over design)	7	6	4	10 wks.	E_1 and E_2 both produced wt. loss. E_1 had the greater loss	5 mos.	Wt. losses maintained
Mahoney, M.J. et. al. 1973	E_1 Effective stimulus control techniques (ESCT)	12	NR	6.4	E_2 Self-punishment + ESCT E_3 Self-reward + Self punishment + ESCT E_4 Self Monitoring + ESCT E_5 Information group + ESCT	12 3 5 16	NR	3.7 5.2 .8 1.4	1 mo.	**Neuman Keuls comparison of treatment means: E_1, E_2, E_3 lost significantly more than E_4, E_5 ($p=< .025$)	4 mos.	E_1 $\bar{X}$ wt. loss 11.5 lbs. E_2 $\bar{X}$ wt. loss 7.3 lbs. E_3 $\bar{X}$ wt. loss 12.0 lbs. E_4 $\bar{X}$ wt. loss 4.5 lbs. E_5 $\bar{X}$ wt. loss 3.2 lbs. **E_3 had significantly greater loss than E_5 ($p=<.05$)
Harris, M.B. & Hallbauer, E.S. 1973	E_1 Self-control techniques E_2 same as E_1 + exercise	11 10	9 7	6.9 9.1	E_3 Attention-placebo	6	5	+0.2	12 wks.	**No significant differences between pre- and post-test wt. loss in treatment groups	7 mos.	E_1, E_2 lost more wt. than E_3. E_2 tended to lose more than E_1 ($t=2.06$, $df=14$, $0.10p<0.05$)

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Variables	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	BEHAVIOR MODIFICATIONS: SELF CONTROL OF EATING Cont.											
Romanczyk, R., et. al. 1973	E_2 Daily weight, self-recording	13	11	+0.09	E_2 No treatment controls	14	12	+0.42	4 wks.	Duncan's New Multiple Range test comparison of means: E_1,E_2 ($p = < 0.05$) E_4,E_5,E_7 differed from E_1,E_2 at $p = < 0.01$ level.	8 wks.	E_4 $\bar{X}$ wt. loss 7.10 lbs. E_5 $\bar{X}$ wt. loss 6.38 lbs. E_6 $\bar{X}$ wt. loss 8.83 lbs. E_7 $\bar{X}$ wt. loss 2.64 lbs.
	E_3 Same as E_1 + caloric intake recording	14	13	5.30								
	E_4 Same as E_3 + symbolic aversion	12	12	8.50								
	E_5 Same as E_4 + relaxation	11	11	5.50								
	E_6 Same as E_5 + behavioral management and stimulus control	7	6	8.17								
	E_7 Same as E_6 + contingency contracting	12	12	6.42								
	BEHAVIOR MODIFICATION: SPECIFIED CONTINGENT REINFORCEMENT											
Bernard, J.J. 1968	E_1 Positive reinforcement plus control of caloric intake	*1	1	102	None				6 mos.	Pt. lost 20% of initial wt.— 4½ lbs. per wk.	NR	Rate of loss slowed down —no indication of reversal
Harmatz, M.G. & Lupuc, P. 1968	E_1 Negative reinforcement; pts. lost money, source of cigarettes, etc.	7	7	9	E_2 Group Therapy	7	7	6	6 wks.	**Analysis of variance showed a main effect for E_1 ($F=3.65$, $df=2/18$, $p < .05$)	1 mo.	Showed a significant treatment effect: ($F=7.3$, $df=2/18$, $p<.01$)
					E_3 Diet only (control)	7	7	0				

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Variables	N	Completed N	$\bar{X}$ wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	BEHAVIOR MODIFICATION: SPECIFIED CONTINGENT REINFORCEMENT Cont.											
Harmatz, M.G. & Lupuc, P. 1968 (Continued)										Duncan's Multiple Range Test: E_1,E_2 significantly greater loss than E_3 ($p < .05$, $p < .01$) E_1 and E_2 did not differ from each other.		
Dinoff, M. et. al. 1972	E_1 Contract	1	1	30	None				7 wks.	Pt. lost 30 lbs. Contract was renewed at each 10 lb. loss		
Korman, I. 1972	E_1 Contractual management: operant techniques, diet, exercise, social skills, training	11	10	10.1	E_2 Operant techniques, diet, exercise, social skills, training	10	10	6.2	10 wks.	**Analysis of covariance for comparison between pre- and post-test mean wts. between groups significant ($p < .01$)	2 mos.	E_1 regained ave. 1 lb. E_2 regained ave. of 2.1 lbs.

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	X wt. loss per subject Pounds	Variables	N	Completed N	X wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	BEHAVIOR MODIFICATION: COVERT SENSITIZATION											
Janda, L. H. & Rimm, D.C. 1972	E_1 Covert sensitization	6	6	9.5	E_2 Attention (control) relaxation + neutral response to weight	6	5	4.5	6 wks.	**E_1 marginally significant over E_3 ($p < .10$) E_2 did not differ from E_3 **Analysis of variance of mean differences between E_1 and E_2 not significant ($F=2.64$ df= 2/15)	6 wks.	**E_1 $\bar{X}$ wt. loss 11.7 lbs. E_2 $\bar{X}$ wt. loss 2.3 lbs. E_3 $\bar{X}$ wt. loss .9 lbs. E_1 highly significant ($F=9.19$, df=2/14, $p < .005$)
					E_3 Non-treated controls	6	NR	+ .7				
Manno, B. & Marston, A. 1972	E_1 Covert sensitization, (negative reinforcement)	14	NR	4.13	E_2 Covert Positive Reinforcement	15	NR	5.1	4 wks.	**Difference between mean wt. loss E_1 and E_2 not significant by Newman-Kuels (df=3,28, $p=< 0.04$). Significant between (E_1,E_2) and E_3 (df=2.28, $p=< 0.01$)	3 mos.	**E_1 and E_2 both differed significantly from E_3.
					E_3 Minimum treatment (control)	13	NR	.83				

TABLE 4. SUMMARY OF CURRENT THERAPIES FOR THE TREATMENT OF OBESITY – 1968-1973 (Continued)

	EXPERIMENTAL GROUP				COMPARISON GROUPS						FOLLOW-UP	
Author Year	Variable	N	Completed N	X wt. loss per subject Pounds	Variables	N	Completed N	X wt. loss per subject Pounds	Trial Period	Results of Treatment	F U Period	Results at Follow-up
	BEHAVIOR MODIFICATION: COVERT SENSITIZATION Cont.											
Murray, D.C. & Harrington, L.C. 1972	E_1 Covert sensitization: aversive conditioning	16	10	5.9	None				10 wks.	**Single factor analysis of variance for repeated measures (comparison of change during baseline with change during treatment) ($F=6.31$, $df=1/27$, $p < .05$)	3 mos.	Wt. loss maintained
	BEHAVIOR MODIFICATION: BIBLIOTHERAPY											
Hagen, R.L. 1970	E_1 Bibliotherapy: use of a written manual utilizing operant	18	18	12.0	E_3 Manual (E_1) + contact E_4 No treatment control	18 35	18 34	15.0 1.8	11 wks.	**E_1,E_2,E_3 achieved significantly more wt. loss than E_4. ($p < .01$). E_1,E_2,E_3 did not differ significantly from each other.	4 wks.	E_1 $\bar{X}$ wt. gain 1.50 lbs. E_2 $\bar{X}$ wt. loss .33 lbs. E_3 $\bar{X}$ wt. gain 1.62 lbs. E_4 $\bar{X}$ wt. gain 1.62 lbs.
	E_2 Group Behavioral therapy	18	18	11.9								
	HYPNOSIS											
Wick, E., et. al. 1971	E_1 "Therapeutic education" with hypnotic suggestion	20	20	10.2	E_2 Diet Control: group discussion + data keeping	8	7	4.3	7-12 wks.	E_1 wt. loss 2.5 x greater than E_2	NR	Observation of author—wt. gain in both groups following termination

For the purposes of this paper, a distinction was made between therapies that are primarily therapist controlled and therapies that are primarily aimed at increasing subject control. Therapeutic situations, mostly controlled by the therapist, fall into the general categories of hospital based therapeutic starvation, surgical procedures and weight loss through the use of "diet pills." Situations that are more subject controlled are low calorie diets, dietary education programs, exercise programs, and behavior modification techniques. It must also be understood that these categories cannot be viewed as rigid. For instance, in many of the behavioral programs such as aversive conditioning and planned contingency management, the therapist's role is predominant in the early part of treatment until conditioning has taken place. It is then the subject's motivation that maintains the conditioning. Or, on the other hand, in therapeutic starvation and surgical reconstruction of the stomach or small intestine, it is hoped that after the surgical procedure the subject will assume control of therapy with some sort of modification of his diet.

Predominantly Therapist Controlled

Drug Therapy

A variety of drugs have been used in the treatment of obesity.

Included are drugs to suppress appetite, alter the rate of basal metabolism, decrease storage of fat in cells, decrease gastric absorption of carbohydrate, preload the stomach, increase the rate of the passage of food stuffs through the intestine, increase water loss, and decrease anxiety. The appropriateness of using a pharmacological agent to treat a condition seen to most often have its roots in social custom, psychological conflict, and poor eating habits, is controversial. Most authors agree that only a small proportion of obesities can be definitely related to glandular problems that are correctable with medication (Solomon, 1971 and Meyer, 1968). Amphetamines have particularly been pointed out for their wide misuse (Penick, 1970, Ruedy and Anderson, 1970).

Amphetamines and close derivatives are the most commonly used drugs in the treatment of obesity. They are used for their anorexiant properties, although the way in which they work is not clearly understood. Meyer and his associates (1968) indicate amphetamines may stimulate the ventromedial (satiety) center in the hypothalamus. Other authors attribute the effect to central nervous system stimulation which distracts the subject from eating while increasing physical activity. Experimental studies show modest success of amphetamine groups compared with placebo groups (Table 4). Freund, Krupp and Goodenough (1971) who tested this medication using different physicians as therapists state that the effectiveness of

drug treatment is also related to the physician's ability to keep patients in treatment. This seems to indicate that loss of weight is not motivation enough for patients to continue in treatment but a particular kind of physician support is also necessary.

Ordinarily the effective duration of amphetamine treatment is about a month to six weeks (Meyer, 1968). Amphetamines may be useful at the onset of a reducing program while the patient is being re-educated and accustomed to the use of a prescribed diet. It is at this point that the long term value of amphetamines breaks down. Studies reporting the use of this therapy do not go on to say just how this re-education is done.

Other medications useful because of their anorectic effect include aminophylline, digitalis, and a drug widely used in Great Britain, fenfluramine. Fenfluramine is chemically related to the well-known anorexigenic drugs, but may also have an additional effect of enhancing muscle uptake of glucose and mobilize fat from some kinds of fat cells (Parfitt, 1973). Another author, however, has challenged the validity of the "glycolytic" action of fenfluramine (Garrow, 1972).

Bulk preparations such as methyl cellulose, are sometimes recommended in the hope that they will produce a feeling of satiety. They appear to have little success and there is no physiological basis for their use. Schachter, in his work on eating following preloading with food versus eating following preloading liquids, would seem to

indicate that water would be more effective than a bulk preparation. No studies have been done in this area, however.

Biguanides, Phenformin, Dibotin, (D. B. I.) and Metformin (Glucophage) have been reported to induce weight loss in some obese non-diabetic patients (Roginsky and Sandler, 1968). Part of this loss appears to be due to an anorectic effect (Anderson, 1972) but biguanides also cause slight reduction in the gastro-intestinal absorption of carbohydrate and markedly reduces the fasting and post glucose intake hyperinsulinism which so often accompanies obesity and increases fat storage. Roginsky states that phenformin has a particular influential effect on those who are obese and have a demonstrated carbohydrate intolerance. He also states that carbohydrate intolerance does occur with great frequency in human obesity (Rogisky and Sandler, 1968).

Glucose, in the form of hard candy, and in combination with benzocaine, caffeine and vitamins, was tried clinically by McClure and Brush (1973). Her rationale was that giving an allowable oral agent to "orally active" subjects would reduce snacking behavior when they were depressed, tired, or anxious. Five months, after the trial period of four weeks, she found that the experimental group (the appetite suppressant candy preparation) lost twice as much as a matched group who were given amphetamines, three times as much as a matched group using AYDS^{R}, an over-the-counter appetite

suppressant, and six times as much as a group using will-power and an 800-1200 calorie diet.

Giving thyroid hormone to obese patients has been a common practice for many years. The aim of treatment is to increase basal metabolism and energy output and theoretically to promote lipolysis by potentiating the effect of epinephrine. Probably only about eight percent of patients suffer from a thyroid malfunction (Solomon, 1971). Great care should be taken before a diagnosis of hypothyrodism is diagnosed and acted upon (Meyer, 1968).

A debate has been raging for more than a dozen years concerning the value of human gonodotropin (HCG) with a 500 calorie diet in the treatment of obesity. One of its proponents, Dr. Harry Gusman, claims he has been using this method of treatment over a period of ten years and has treated well over 2,500 patients of both sexes, aged fifteen to seventy-five years. Although no double bind studies or experimental studies were done, he claims:

> Ninety percent of patients were able to receive some benefit from the treatment, sixty to seventy percent were able to reach their desired weight, the majority of patients claimed the treatment was easier to follow than other diets, patients experienced a sense of euphoria on the diet, and that the most markedly successful dieters were among those most obese (Guzman, 1969, p. 686).

Albrink (1969), however, raised some questions concerning the reported successful use of HCG: First, does the HCG bring about the

weight loss through the mobilization of what Dr. Gusman calls "abnormal fat" or is its effect to decrease hunger, or is the loss of weight due simply to the 500 calorie diet which is also low in carbohydrate, known to reduce hunger feelings. A study by Sohar (1959) appears to indicate that HCG plus diet did not effect more weight loss than did diet alone. Secondly, Dr. Albrink questions the long term usefulness of HCG treatment. Patients are required to take repeated courses of treatments consisting of daily injections of HCG for six days a week, plus have daily conferences with the physician concerning the previous day's diet. The third question she raises is the possible mechanism of action of chronic gonodotropin in obesity. She states, "It could be due to a direct lipolytic effect on the adipose tissue, an indirect effect on the hypothalamus or an effect on the gonadal hormones possibly released under its influence" (Albrink, 1969, p. 682).

She concludes by saying that while many possible effects of HCG on obesity might be entertained, at the moment the burden of proof that it does anything at all is on the shoulders of its proponents. Even if some effect is conclusively shown it will more likely be on theoretically interest rather than a practical tool for the life-long treatment of obesity (Albrink, 1969).

Laxatives have been given in the hope that speeding food stuffs through the digestive tract would prevent the uptake of nutrients by

the small intestine. This is uncomfortable at best and dangerous at its worst. Large amounts of fluids and electrolytes can also be lost this way and bring about an electrolyte imbalance.

Other drugs that have been given include diuretics and anti-anxiety drugs. Asher and Dietz (1972) studied the relative effectiveness of some of these "diet pills' in a controlled clinical study including a large number of subjects (Table 4). Asher reports that all patients in the "diet pill groups:" digitalis group, thyroid group, and amphetamine group, lost significantly more weight than the "literature group" which stressed a specific food plan. Of the 1409 patients starting in the diet pill groups, 38 percent lost twenty pounds or more and 10 percent lost forty pounds or more. In the literature group containing 1269 patients, 24 percent lost twenty pounds or more and 5 percent were able to lose forty pounds or more. Two other observations that Asher makes are that the use of thyroid (4 gr. a day) was shown to be useful in the best percentage of forty pound losers and that digitalis has no apparent effect on weight loss.

In summary, drugs appear to be useful when used specifically and after careful screening of the patient for physiological or psychological disorders. It is most effective given over a relatively short period of time to produce successful weight loss, encouraging and reinforcing the patient to maintain that loss through the use of a low calorie diet.

Therapeutic Starvation

Prolonged total starvation is a comparatively recent therapy and is used primarily in the severely obsese, those 100 pounds over their ideal weight. Subjects are typically hospitalized and no caloric intake is provided while intake of fluids, vitamins, and electrolyte replacement are maintained. Physical activity is usually encouraged. Three major techniques are used: short term - up to two weeks, intermittent and prolonged. A review of the literature describing clinical trials of these techniques, indicate that all produce rapid weight loss, usually approximately one pound per day. Attrition rates are high even while in the hospital and follow-up indicates that ideal weights are not reached and weight loss is not maintained (McEwen, Jacobson and Buttrum, 1972). In a follow-up study composed of twenty-five patients who had been starved in a hospital for twenty-five days, it was found that most of the patients had regained the weight lost in the hospital. Of the fifteen patients followed for fourteen months in an outpatient facility, only four weighed less than they did before fasting. The one patient who did make a strenuous and partially successful effort became so depressed he needed psychiatric help (McEwen, et al., 1972). Similar results are reported by other authors (Swanson and Dinillo, 1969 and 1970 and Hermann and Iverson, 1968). Moreover, while psychological distress is unusual during short term and intermittent fasting, prolonged starvation can be accompanied by tension, perceptual changes and hostile-aggressive behavior (Swanson and Dinello, 1968). Severe psychiatric disturbances have also been

reported following self-induced "crash" weight loss (Robinson and Winnek, 1972). Some studies have also reported physical disturbances ranging from loss of hair to peripheral neuropathy and liver disease (Rooth and Carlstrom, 1970).

It must be concluded that a reduction of the obese state is not alone sufficient motivation for continued restriction of food intake and that clinical trials of this method to date strongly suggest that complete starvation is of little value in the long term management of obesity.

Intestinal and Gastric Surgery

The jejuno-ileostomy bypass procedure has been reported frequently in the medical literature for the past several years. As early as 1954, a procedure with 90 percent jejuno-ileoal bypass with end-to-end anastomosis 4 cms from the ileocecal valve was done by Kremen, Linner and Tulson. The bypassed small bowel was anastomosed to the ascending colon. In more recent years several other intestinal procedures and some gastric bypasses and gastroplasties have been done. While stating that intestinal bypass procedure for the treatment of the morbidly obese is a "very acceptable procedure" (Payne, Dewind, Schwab and Kern, 1973, p. 422), the authors stress the importance of adhering to rigid criteria for the selection of patients. Patients must be at least 100 pounds overweight,

have tried all other methods of weight reduction and failed, and they should not be over fifty years of age. Additionally, each patient must be emotionally stable and willing to cooperate. The medical record should be documented to insure follow-up. Finally, patients should be worked up and followed by an internist or an endocrinologist who understands the serious metabolic changes that take place following the intestinal bypass, particularly in relation to the liver changes. The surgery itself should be done by a surgeon who does them often and in major facilities (Payne, et al., 1973). The malabsorption syndrome resulting from the operation that brings about the loss of weight can also bring about protein malnutrition and development of fatty liver and occasional peripheral neuropathy and other signs of vitamin deficiency. Calcium loss may be excessive. Diarrhea, dehydration, and renal stones may all be complications and may result in a need to restore the continuity of the intestine. The critical period exists for the first one or two years following the bypass surgery when the weight loss is occurring most rapidly. Once a plateau at a lower weight level is reached, these dangers are less frequent. A representative example of this procedure is that reported by Payne, et al., 1973. One hundred sixty-five intestinal shunts were performed over a sixteen year period. Both short and long term weight losses were shown to be satisfactory. Four patients required restoration of continuity due to complications, and

sixteen patients required revision of the bypass to gain maximum benefit. The overall mortality related to the bypass surgery was six percent, which compared to the excess mortality due to untreated obesity does not seem unusually high.

Another, potentially reversible operation, called gastic bypass, limits food intake but allows more normal digestion and absorption (Printen and Mason, 1973). In patients who were 100 pounds overweight, one-third were able to lose 100 pounds, and one-third lost more than fifty pounds. While gastric bypass is a more difficult operation to perform, the patients lose fat without as great a risk of malnutrition and complications as that associated with intestinal bypass. The gastroplasty procedure maintains continuity of the stomach through a greater curvature tube and provides a smaller pouch of stomach and from which food is emptied into the small intestine. In a clinical trial it was considered less effective than gastric bypass (Table 4).

In summary, clinical trials seem to indicate that intestinal and gastric shunt surgery is an acceptable procedure for the massively obese patient for whom all other treatment measures have failed, providing rigid criteria are met. Significant weight loss commences almost immediately and in most cases reaches a reasonable level. Certain side effects, such as diarrhea can be expected and other more

serious complications that should be closely watched for include liver failure, dehydration and electrolyte imbalance.

Psychotherapies Aimed at Increasing Subject Control

Education, Dietary Counseling, and Exercise

Dietary regimens and nutritional re-education, combined with an exhortation to increase exercise have been helpful to some patients with a moderate amount of obesity. However, these procedures are seen as generally ineffective for those who are grossly overweight. Coupled with the component of "physician support," studies such as that reported by Levelle (1971) give the impression that control of these variables does have a positive effect on weight control (Table 4). More studies, however, use this approach as the comparison variable or term it the "traditional approach." The problem of transfer from the external control supplied by the visit to the physician, to internal controls of the client, has been difficult.

Behavior Modification Techniques

The principles of learning through selective reinforcement popularized by Skinner and formed into the psychotherapy of behavior modification, comprise many of the studies reviewed in the summary of recent literature. Many of the studies presented in Table 4 make

use of a variety of behavioral procedures in a comprehensive program. However, for the sake of reviewing the main components of different experimental and case studies, six different types of treatment have been identified: (1) aversive conditioning; (2) self-control of eating; (3) specified contingent reinforcement; (4) covert sensitization; (5) self-use of operant procedure via biblio-therapy and other procedures; and (6) suggestion.

The term reinforcement refers to any stimulus which "increases the probability of a response when it is used continuously with or immediately after the response" (Cautela, 1970, p. 33). A reinforcing stimulus may be given in any of three ways: (1) externally, transferred to the central nervous system via external receptors such as food, music, smiling, praise (therapist controlled contingent reinforcement); (2) by direct stimulation of the external receptors such as electric shock or a noxious odor (aversive conditioning); (3) or the stimulus may be presented by instructing the subject to initiate "mediational processes," such as thinking or imagery (covert sensitization).

Aversive Conditioning

An early example of directly applied reinforcement to modify eating behavior is that of Moss in 1924. The experimenter paired vinegar consumption with a clicking noise. The conditioned stimulus

was then presented with a food (orange juice) and it was found to inhibit the subject from taking the food (Abranson, 1973). Further, Wolpe (1954) paired electric shock with the image of particular forbidden food in the treatment of one obese woman. After five sessions, she felt free of the problematic foods.

Presented in Table 4 is the aversive conditioning study of Kennedy and Foreyt (1968). These authors paired the smells of desirable foods with a noxious odor in the treatment of one grossly obese female. The procedure was to collect a hierarchy of foods the subject desired or draved for, including such things as candy, puddings, cakes and so forth and, while the subject was wearing an oxygen mask, the smell of one of the desired foods was presented. At a predetermined signal, the stopcock was switched and noxious gas was blown in. This procedure was repeated approximately twenty minutes during forty-one conditioning sessions over a twenty-two week period. The subject was found to lose at a relatively slow and small rate. She reached her lowest point at the end of thirteen weeks (38 pounds) and then regained to the overall weight loss of thirty-three pounds. It was also noted that she had increased her intake of other non-conditioned foods and that attempts to increase the amount of time in exercise met with only modest success. In 1971 these same authors conducted a controlled study using this same procedure and compared its effects with a control group comprised of members

of TOPS (Take Off Pounds Sensibly). At the end of nine weeks, the aversive conditioning groups average weight loss (13.3 pounds) was significantly greater than that of the control group (1.0 pounds). At the four month follow-up the experimental groups had continued to lose (9.17 pounds) while the control group had gained (1.33 pounds) (Kennedy and Foreyt, 1971).

In another study by Harris (1969) of a treatment designed to enable subjects to lose weight through self-monitoring techniques, aversive conditioning was added to one of the treatment sub-groups. No additional effects due to the sessions of aversive conditioning could be demonstrated.

Aversive conditioning appears to be best used in cases of particular food cravings. Reflecting that aversive conditioning was one of the first behavioral methods applied to the treatment of obesity, there are relatively few studies in literature reporting its use and little evidence that aversive techniques, used solely, is effective methods of treatment for obesity.

Self-Control of Eating

Four principles are involved in the utilization of operant principles involved in treatment programs focusing on self-control of eating procedures. They include: (1) a description of the behavior to be controlled; (2) modification and control of the discriminatory stimuli

governing eating; (3) development of techniques to control the act of eating; and (4) prompt reinforcement of behaviors that delay or control eating (Stunkard, 1972). The theoretical framework was described by Ferster, Nurnberger, and Levitt in 1965 and has been developed by numerous authors since that time. Stunkard points out that the use of these principles have been a turning point in the outpatient treatment of obesity:

> It has, in the past been fairly easy to assess any outpatient treatment for obesity because the results have been so uniformly poor and the treatments themselves so obviously inadequate. (Inpatient treatment, with its potential for greater control of the patient has of course been more successful in weight reduction. Its usefulness has been limited, however, by the almost invariable regaining of weight after discharge.) I have summarized my own and my colleague's results with outpatient treatment quite simply; most obese persons will not stay in treatment for obesity and of those who do stay in treatment, most will not lose weight. Of those who do lose weight, most will regain it. Attrition rates vary between twenty percent and eighty percent. Only twenty-five percent of those who enter treatment lose as much as twenty pounds, only five percent as much as forty pounds. Against this background, the results obtained by Ferster, et al., whose subjects averaged weight losses of only ten pounds, must be considered poor. Against this same background, moreover, the significance of a report on "Behavioral Control of Overeating" is at once apparent. For in this report, Stuart, using a treatment program based on Ferster, et al.'s described the best results yet obtained in the outpatient treatment of obesity (Stunkard, 1972, p. 391).

Stuart (1965) describes a step by step program based both on Ferster's operant procedures and incorporating respondent techniques.

Stuart describes the purpose of the program as aimed at "building the skill of the patient in being his own contingency manager" (Stuart, 1965, p. 357). After applying this program over a twelve month period to eight patients, Stuart reported the greatest weight losses to that date in the outpatient treatment of obesity. At present only Wollersheim's results are as good. Three of the original sample lost more than forty pounds and six lost more than thirty pounds. Stuart treated his patients individually. In more recent reports, Stuart (1971) and Stuart and Davis (1972) have expanded these techniques to include a three-pronged approach: self-control of eating, diet, and exercise.

Three experimental studies have been reported by Harris (1969), Harris and Bruner (1971) and Harris and Hallbauer (1973) comparing the effects of self-control techniques, a contract system, and exercise. Although results of weight loss in subjects were not as high as those quoted by Stuart, Harris consistently found self-control techniques clearly superior to no treatment control groups (1969). Contract management attracted few participants and produced short term weight loss but not long term loss (1971). The addition of exercise to a program of self control effected greater weight loss than the group dealing with eating behavior only (Harris, 1973).

An often quoted study is that of Wollersheim (1968). In a carefully controlled experimental design, Wollersheim attempted to disentangle the contributions of various treatments for obesity. Four conditions were established: (1) focal treatment, behavioral; (2) non-specific therapy, discussion of "underlying motives" and "personality make-up"; (3) social pressure, an attempt to replicate the procedures of weight reduction clubs such as TOPS; and (4) a control group who were promised treatment at a later time. All treatment groups produced significant weight losses. However, treatment and follow-up comparisons revealed the focal behavioral group was superior. All subjects in the behavioral group lost nine or more pounds as contrasted with twenty-five percent of the social pressure group, forty percent of the non-specific group and only six percent of the control group. Fifty percent of the behavioral group still met this criterion at follow-up.

Wollersheim and Harris both included subjects in their studies who were slightly to moderately obese. One other representative study in this group is that of Penick, Filion, Fox, and Stunkard (1971) who report the effects of the behavioral approach compared with traditional group therapy on severely obese subjects (seventy-eight percent). Experimenter biases were partially controlled by using therapists who had strong clinical backgrounds in the procedures they were using. Two findings were noted: weight losses for the

behavioral groups (24 and 13 pounds) were greater than for the control groups (13 and 11 pounds); and there was a far greater variability of results in the behavior modification groups.

The systematic self-presentation of reinforcement was studied by Mahoney (1973, 1974). To a basic program of self-control techniques, conditions of self-punishment and self-reward, self-monitoring, and information were added. Self-reward plus self-punishment added to the self-control techniques were found somewhat less effective than self-control techniques alone at the end of the four week treatment period, but were the more successful treatment at the follow-up. Again in the later study she compared: (1) self-reward for weight loss; (2) self-reward for eating habits improvement; (3) self-monitoring of eating habits and weights; and (4) a delayed treatment control group. In this attempt to clarify the short term and the enduring effects of self-monitoring and self-reinforcing influences she found that self-monitoring has an initial marked effect on weight loss. However, eight weeks of continuous self-monitoring failed to produce significant overall improvement in weight reduction. Secondly, subjects who rewarded themselves for altering daily eating habits rather than simply for weight loss maintained greater weight loss. The marked effect of self-monitoring has also been mentioned by other authors (Johnson and White, 1971; Romanczk, Tracey, Wilson, and Thorpe, 1973).

Specified Contingent Reinforcement

In contrast to self-reinforcement, planned and specified reinforcement is supplied by the therapist contingent upon the subject's achieving the reward. Bernard (1968) reported a case study in which the subject, a grossly obese, institutionalized, schizophrenic female, lost 102 pounds, at a relatively stable rate, over a six month period of time, through the use of tokens given for adherence to an 1800 calorie diet. These tokens were then exchanged for "walkout privileges," telephone calls, recreation, movies, and even the rental of a private room. The status gained from the patient's "earning power" served to maintain the desired behavior by acting as a powerful secondary reinforcer.

Again in an institutional setting, Harmatz and Lupuc (1968) compared the effectiveness of behavior modification condition of specified contingent reinforcement by controlling the subjects allotted monetary source for cigarettes, beverages, supplies, etc., contingent upon subjects' loss of weight. The comparison conditions were: (1) group therapy, where the subjects were under social pressure to lose weight and were socially reinforced for weight loss; and (2) a control group on a diet. The findings indicated that both behavior modification and group therapy groups produced weight loss (nine pounds and six pounds, respectively). However, the behavior

modification group continued to lose weight during follow-up while the group therapy subjects regained the weight they had lost.

While these studies appear to indicate that token reinforcement systems are effective, their application outside an institutional setting presents practical problems. The use of a contract system between the therapist and subject is one attempt to maintain effective control of reinforcement on an outpatient basis and involves an exchange of rewards between two parties contingent upon the behavior of the other. Korman states that these "structured social arrangements for the successful execution of the contractual contingencies increases both the sources of reinforcement and the opportunity for monitoring behavioral change during treatment" (Korman, 1972, p. 27).

Dinoff, Richard, and Colwick (1972) report a case study in which a ten year old emotionally disturbed boy, in a partially controlled setting of a summer camp, was able to lose thirty pounds in a seven week period of time through the use of a contract that was renewed at every ten pound weight loss.

An outpatient experimental study, reported by Korman (1972) compared a comprehensive behavioral program including operant techniques, diet, exercise, and social skills training, alone, and with the addition of contractual management. While both groups produced weight loss, the contractual management added to a comprehensive behavioral program, was found to produce significantly

greater loss at the end of the treatment. At the end of the follow-up the experimental group had regained less weight (ave. 1 pound) than the control group (ave. 2 pounds).

The accountability of contracts, defining the specific behavioral tasks involved in carrying out a behavioral program, rather than weight loss only, have the advantage of being able to provide immediate positive reinforcement. A problem in the long term effect of therapist planned reinforcement for weight loss only is that patients may not find sufficient reinforcement in their natural environment to maintain a reduction in weight. Certainly other treatment modalities such as therapeutic starvation have demonstrated that weight loss alone is not sufficient reinforcement to maintain a weight loss.

Covert Sensitization

The behavioral procedures designated by Cautela as "covert," because the response and reinforcing stimuli are presented in the imagination, has also found use in the treatment of obesity. Typically, the patient is taught to relax, and a therapist vividly presents scenes in which the patient approaches forbidden foods, becomes nauseous and vomits. Interdispersed with these scenes are scenes in which the patient approaches the target food, felt nauseous, retreated and immediately felt a sense of relief (Cautela, 1970).

Some early experimental tests (1971) of this procedure were judged to produce small weight losses or losses equal to those of modified systematic desensitization groups and groups taught relaxation techniques (Meynen, 1970). Lick and Bootgen (1971) compared covert sensitization to no treatment control groups and found similar results. Three more recent studies indicate that in combination with other procedures this technique may be useful (Table 4).

Janda and Rimm (1972) compared covert sensitization to two control groups (relaxation and neutral response to eating) and a non-treated control group. Although significant differences were found between the treatment conditions and the no-treatment group, no significant differences were found between treatment groups at the end of treatment. At six weeks follow-up, however, a significant effect was found for the covert sensitization group. A positive relationship was noted between reported distress to the imagined scenes and weight loss.

Manna and Marston (1972) compared covert reinforcement without aversive scenes to the typical covert sensitization procedure. Again the difference between treatment and no-treatment groups was significant, although the differences between treatment groups were not. The covert reinforcement group without aversive scenes, however, while not significantly different, subjects did lose more weight.

A covert sensitization condition compared to no treatment controls was also reported by Murray and Harrington (1972) and significant weight loss by the covert sensitization group at the end of treatment, and follow-up was demonstrated.

Covert sensitization is found to consistently effect significantly more weight loss than no-treatment controls, but amounts of weight loss is less than self-control procedures. It is more difficult to show that covert sensitization is significantly better than attention-control groups. Reinforcement directly applied as aversive conditioning or indirectly applied as covert reinforcement are successful in conjunction with other self-control techniques. Practically, to effectively sensitize subjects to a large number of different problem foods and situations would take a considerable amount of time.

Bibliotherapy and Other Therapies

Hagen (1970) who acted as one of the therapists in the study reported by Wollersheim, compared Wollersheim's behavioral program with a group who used a written manual utilizing the same operant learning principles, and a group combining contact with biotherapy. Again, all treatment conditions were significantly better than non-treatment controls. Because the treatment groups did not differ significantly from each other, Hagen concluded that

bibliotherapy alone was as effective in effecting weight loss as therapist contact behavioral groups.

Another interesting technique related to behavior modification is described by Gygi, Saslow, Sengstake and Weitman (1973). Gygi and associates compared the use of a self-confrontation procedure with a comparison group who used a self-directed program for general relationship improvement (HDI). The procedure is described as "the programmed rehearsal of a personal problem by one person alone, for a five minute period; the rehearsal being as vivid as possible, intellectually, emotionally, visually, and physically" (Gygi, et al., 1973, p. 315). The planned "time out" periods were used as an alternative to eating in response to the desire to eat and were found to change the character of the feelings, thoughts, and sensations. Results showed that self-confrontation was an effective tool for short term weight loss in moderately obese people. No follow-up report was made.

Suggestion

Wick and others describe the usefulness of providing "therapeutic education" and suggestion while the client is in a state of relaxation or hypnosis. The sessions as described by Hartman (1969) included weight and dietary reporting and free ventilation before hypnosis. Group hypnosis was then induced and appropriate

suggestions were given for correcting poor eating habits. Wick, Sigman, and Kline (1971) emphasize the necessity of continuous involvement of the patient in this type of therapeutic education not only to achieve weight loss but for its maintenance. It was found by Wick and his associates that weight gains were "shockingly high" in the weeks following termination of the groups.

The multifaceted treatment "package" of many of the behavioral studies led Romanczyk, et al. (1973) to a comparative analysis of the effectiveness and limitations of the major components included in behavior modification programs. In the study, a "sequential dismantling" strategy was used in which the techniques of a typical, full, therapy program were systematically removed one at a time. Additionally, all the therapists who participated in the experiment had impressive experience in the application of behavioral treatment programs. Groups included: (1) no treatment controls; (2) daily weight self-recording, in which students plotted daily weights on a graph and were given written nutritional information; (3) daily weight and caloric intake self-recording, in which students were additionally asked to keep running cumulative totals of all food and beverages; (4) self-monitoring, symbolic aversion, relaxation, in which students were additionally given muscle relaxation training; (5) self-monitoring, symbolic aversion, relaxation, behavioral management and stimulus control instruction, in which students additionally participated in a

program modeled after Stuart (1969, 1971); and (6) self-monitoring, and contingency contracting, in which students were additionally asked to deposit money with the experimenters that was returned to them contingent upon weight loss. The major finding of the study was that self-monitoring of daily caloric intake was effective in producing short-term weight loss. Although results were in the predicted direction, none of the other treatment groups are significantly more effective than self-monitoring alone. While self-monitoring was more effective for initial weight loss, the possibility remained that a full complement of behavioral treatments would be superior for long-term maintenance.

A second study was done to test this possibility. An information, self-monitoring, and relaxation group was compared to a second group of subjects who used self-monitoring, information, relaxation, behavioral management and stimulus control instructions, and symbolic aversion. The results again confirmed the efficacy of self-monitoring. In contrast to the previous study, however, the addition of other self-control methods resulted in a statistically significant greater treatment effect than that obtained with self-monitoring, both at three and twelve week follow-ups.

Summary

In summary, the observation made by Stunkard that programs based on behavioral techniques show consistently good results, appears to be confirmed by reviewing literature in this period of five years. The ability to produce weight loss by use of self-monitoring procedures, aversive conditioning, covert sensitization and specified contingent reinforcement have all been shown. It would appear, however, that results emanating from broad behavioral programs like those of Stuart, Wollersheim, and Penick show greater weight losses and maintenance of weight reduction. Findings such as that of Romanczyk substantiate this observation.

Some of the problems that are apparent from a review of studies relating to treatment of obesity were highlighted in compiling the summary table (Table 4) and have also been mentioned by Stunkard, Feinstein and Abramson. One of the difficulties in evaluating the reported results of clinical trials of therapies for obesity is that they have little uniformity. Results are often reported in such a way that comparison of the results with other studies is impossible. The dependent variable most often reported is average mean weight loss per patient during the length of the trial period. This was the method adopted in the table. Stunkard and McLaren (1959) have suggested using as a criteria of reporting, the percentage of patients losing 20

pounds or more and the percentage losing 40 pounds or more. Other authors have adopted this method (Asher and Deitz). Asher, et al. (1972) also suggest the adoption of Trulson, Walsh, and Casco's criteria for success which includes the percentages of those successful in losing 10, 15, 20, 25, 30, and 35 pounds, in different weight categories. Both of these methods include data from all starting subjects and objectively report individual accomplishment. A plea is also made by Feinstein (1961) that patients be measured after the study and again after some follow-up interval. He also contends that double blind studies should be done to eliminate bias of personnel or clients enthusiasm about a new form of treatment. Notable of studies that have made some attempt to control this variable are those of Penick (1970) and Romanczyk (1973).

Other additional factors that may influence treatment outcome have been pointed out by Abramson (1973). They include sex, age, and external sources of reinforcement. Harris (1969) suggests that data appear to indicate that the program (self-monitoring techniques) may have been more successful for males than for females (Hall, 1972). She suggests that the relatively poor results of self-control techniques in her study may have been due to the relatively greater age of subjects. "Failure to attend to social reinforcement factors," states Stuart, "may in effect ask the overeater to modify his behavior while the pathogenic shaping influences continue to operate unchecked"

(Stuart, 1972, p. 32). Stundkard (1972) states that length of time the subject has been obese, age of onset, and the degree of obesity may also effect the patient's ability to benefit from a weight reduction program.

Finally, behavioral programs should be seen not only as an end in themselves, but as an appropriate approach to problems of obesity even with these subjects who require surgical or other intervention. The loss of weight in itself has not been shown to be sufficiently reinforcing to maintain weight loss. Relearning of eating habits is basic to all regimens of intervention and it would appear that behavior modification procedures is the one method that specifically deals with the reshaping of faulty eating habits.

Environmental Control of Problematic Eating

Review of the literature reporting current therapies for the treatment of obesity confirmed the behavior modification principles to overeating as a reasonable and hopeful approach. The influences of the environment to maintain and reinforce the cycle of eating and keeping the overweight individual in a perpetual state of positive caloric balance are mentioned in both studies dealing with obesity as a personality problem and those dealing with overeating as a behavioral problem. Dr. Phillip White, Secretary of the Council of Foods and Nutrition, of the American Medical Association, attributes the

sociological factors of changing eating patterns as a factor in maintaining problematic eating patterns. Dr. White states that society has moved towards "individualized unstructured modes of eating," and has become "a mini-meal, snacking society." Meanwhile, labor saving devices and sedentary activities decrease the expenditure of energy.

It has been suggested by Stuart and Davis (1972) that the way environmental influences affect eating practices can be conceptualized in two ways.

The conceptualization of the mode of environmental influence by psychodynamic theories has been symbolized by Stuart as follows:

Personality ⟶	Behavior ⟶	Consequences
e.g. low esteem, tension, etc.	e.g. selecting high calorie foods, eating large amounts of these foods at frequent intervals	e.g. high blood sugar level, social ostracism, etc.

Stuart then goes on to say that intervention into the personality problems with all its "affective and cognitive implications" would logically change the problematic behavior. "Regrettably, efforts to use this approach in the treatment of overeating have met with less success than hoped for" (Stuart, 1972, p. 43). Stuart has devised a second model using the same basic elements as the psychodynamic model, however, the point of entry for intervention is different:

Behavior →	Consequences →	Thoughts, feelings
e.g. underexercising, through double parking in front of the store.	e.g. weight gain, resulting in loss of mobility	e.g. sense of low self-esteem and depression

Using this approach Stuart states it is not necessary to isolate the psychodynamic forces, although he does not deny that they may exist. Rather, efforts are directed at the immediate change of eating behavior by changing the situations in which the problematic eating occurs and the direct manipulation of behavior itself. A positive change in eating practice, then can be expected to lead to a change in thoughts and feelings about oneself.

To increase the probability that positive behavior occurs, the environment is structured in such a way to give prompt and continuous reinforcement of a magnitude great enough to sustain the new behavior.

A systematic detailed program for the environmental management of problematic eating based upon work done by Stuart, Wollersheim, and other behavior modification programs will be described in this study.

Videotape Replay to Enhance Learning

Introduction

The therapeutic setting that would allow for the most optimum learning was carefully considered. One tool that was found useful by

several authors to accelerate learning is the use of videotape replay. Normal Kagan (1969) at Michigan State University developed a method to better train counselors or therapists that he termed Interpersonal Recall Process (IRP). A counselor and a client conducted a counseling interview which was video-taped. Immediately after the interview was concluded, the counselor left the room and a second counselor, the "interrogator" (who had previous training in how to encourage participant recall) entered the room. A playback of the interview was conducted. Either the interrogator or the client could stop the playback as often as he wanted to discuss client-recalled feelings or elaborate on meanings. While this procedure was begun with the intent to better educate counselors, it was noted that the client frequently gained insight as well and that the clients' progress in therapy was accelerated. Kagan identified four characteristics of client behavior that indicated client progress or growth.

> 1. The client admits his own discomfort. This characteristic is the clients motivation to change, including recognition on his part of his responsibility for his own condition.
> 2. The client commits himself to change. The client is cooperative with the counselor, he decides he wants to change, is willing to deal with his problem, and faces the consequences of changing.
> 3. Clients who progress in counseling typically seem to learn to perceive more of the stimuli which surround them, and to better identify and differentiate their emotions and reactions to these stimuli; thus, the clients differentiate stimuli. [Kagan states that this characteristic is perhaps the most important.]

> 4. The fourth characteristic is behavior change. The client behaves differently within the counseling situation, redefining his relationship with this counselor. He also reports changed behavior outside the counseling dyad, in the real world. The client behaves differently. (Kagan, et al., 1969, p. 309)

Kagan attributes the accelerated client growth of clients involved in IRP to be due to the client becoming the observer of his own behavior, and the ability of the IRP process to review where breakdown in the teaching-learning process occurs.

Blount and Pederson (1970) report a study that demonstrates the effect of teacher's viewing themselves on videotape and its positive effect on the teachers self-concept. Subjects in teams of three were randomly assigned to a video playback condition or a non-video playback condition. All subjects then taught a seven minute lesson which was videotaped. The subjects who viewed their own teaching and then filled out the research instruments scored higher in measures of body-cathexis (sense of identification with screen image of self), self-concept, public self, self assurance and flexibility, among other variables, than subjects who did the questionnaires without the video playback. While the differences were not significant, this author states the difference was significantly consistent and would indicate that immediate feedback of one's performance has a positive effect on self-concept.

Viewing oneself appears to have a "self-confronting" effect on the viewer. In a study to determine the relationships between obesity and body-image, Katz (1969) found that obese subjects consistently underestimated their actual weights and that when viewing themselves on closed circuit television, white obese subjects had a more negative body image attitude than Negro obese females who recognized their overweight condition, yet liked themselves. He hypothesized that the self-confrontation of video tape replay could enhance, intensify, or change subjects' self-perception and their body-image attitudes.

Alger and Hogan (1969) describe short and long range effects of the use of video tape replay. They emphasize that data being viewed are objective data and eliminates the personal bias of either the client or the counselor. Both the client and the counselor have an equal opportunity to participate in assessing changes in behaviors and there is increased recall of all that happens in a therapy session which the video tape captures in both content and context. There is an impact of viewing one's own image and behavior and having a "second chance" to make more clear and direct thoughts and actions. Since neither the client nor the therapist can manipulate what is being viewed on the screen, there is a separation of the participating self, and the observing self, leading to equal involvement in the problem solving components of therapy. Over a period of time the self-confrontation

effect of the visual image of one's self, Alger states, tends to decrease and there is an increase in the ability to become an observer of one's own behavior. Used over a period of time, there is also an increasing awareness of behavior change and an awareness that different cues at different times often produce totally different experiences that show clients evidence of the range of possible adaptive behaviors. The evidence of how behavior has changed seen by viewing a video tape made earlier in therapy has a reinforcing influence to maintain behavior change. Alger concludes by saying that "video tape enables behavior to be seen in terms of an interpersonal system.... Insight gained from becoming an observer of one's own behavior provides insight that is meaningful and lasting" (Alger and Hogan, 1969, p. 94).

Instant replays of family scenes have been used to teach parents of hyperkinetic children to cope with the secondary behavior problems that accompany this condition. The approach was found remarkably successful. The children followed for one year and treated with this procedure did well after only five sessions and results of twenty more patients followed for six months also appeared favorable (Furman and Feighner, 1972). The focus of treatment was to first make parents aware of the significant lack of positive reinforcement they gave the child, and then teach by modeling how this reinforcement could be given. The author states that "this method is not for everybody.

Only those parents with enough ego strength to tolerate critical comments are considered suitable for this sort of approach" (Furman, 1972, p. 1219).

The impact of immediate feedback has been pointed out by studies and discussions concerning the increased use of video tape replay as an instructional medium for teaching nursing care (Rockwell, 1971; Quiring, 1972). Other, very practical reasons, to record nursing care for instructional use on video tape are given by Chow (1971).

> 1. Economy; video tape used on a relatively low-cost recorder can be erased and reused. 2. Compactness; the equipment is relatively compact and its use easily learned. 3. Continuity; the record of patient care can be reviewed over a length of time. 4. Analytic tool; the tape can be played back repeatedly to identify, classify, and quantify the nurse-patient interaction with accuracy and precision and can also be given to an independent observer for the same analysis. 5. Interview supplement; the nurse herself can observe her nursing interaction, stimulating her own recall and aid in increasing the quality of her nursing care (Chow, 1971, p. 1490).

The components of teacher strategy, learner strategy, and the affective components that may increase or decrease the effectiveness of learning taking place in the patient-teaching, client-counseling interaction have been described. Video tape replay has been shown to have a positive effect in that the participants in the teaching-learning situation have the opportunity to become observers of their own behavior. The ability to be a participant-observer of one's own

behavior increases the effectiveness of communication, increases self-awareness and self-concept and brings about observable behavioral changes has been described in the literature.

It has also been pointed out that the video tape replay is a practical tool, easily learned and of a relatively low cost.

Purpose of the Study

Five components emerge from the review of literature surrounding the problem and management of obesity and videotape replay.

1. Obesity is a prevalent and serious health problem. There is an increased incidence of persons overweight in the population of the Cardiovascular Evaluation Clinic. The stress of excess weight on an already compromised cardio-vascular system is serious.

2. Outpatient therapeutic programs based on behavior modification principles show consistently good results.

3. There is a need for dietary re-education in general and for dietary counseling in relation to heart disease.

4. Exercise has both a direct effect on energy balance and cholesterol levels in the blood and an indirect effect of increasing physical fitness in the treatment of obesity.

5. Closed circuit television can be used to greatly enhance the client-therapist interaction.

Therefore, this study was undertaken for the purpose of reporting on the following:

A. Development of a treatment program utilizing several well-known useful behavioral components and incorporating the use of videotape replay. This broad approach included the situational control of eating, nutritional education and direct manipulation of the dietary intake, and evaluation of the clients present level of exercise preliminary to the instigation of a systematic exercise program.

B. The clinical trial of the treatment approach on two patient subjects. The subjects chosen were from a larger clinical population with a medical disease entity for whom treatment is known to be complicated by excess adiposity.

CHAPTER IV

METHODOLOGY

Introduction

This study was designed to describe the clinical trial of a comprehensive behavioral program for weight reduction which incorporated the use of videotape replay. It was conceptualized as a necessary initial step, which would help obese individuals lose weight, while further developing the method and procedure for use in clinical practice and for further investigation.

> Abdellah gives three specific aims for research in nursing:
>
> (1) to discover new facts, or descriptive research; (2) to discover the relationship among facts, explanatory research; and (3) to develop methods, tools, products, or procedures for conducting further research and for use in clinical practice, methodological research (Abdellah and Levine, 1965, p. 422).

Further, Lindemann has stressed that nursing is a "practice" discipline and the only valid reason for research in nursing is to improve the practice of nursing (Lindemann, 1973). The present investigation falls into the category of methodological research. It fulfills Abdellah's third aim of nursing research in that its purpose is to develop a tool for use in nursing practice which can be further tested against other clinical nursing modalities. The program is described

in terms of its effect on the control of weight in two obese cardiac surgery patients.

A need for the establishment of a program for weight reduction in the selected clinical population has been established and is shown in Table 3 (page 9). Reduction in adiposity clearly increases both the length (Table 2, page 7) and quality of life.

Preliminary Work Done by the Investigator

For the purpose of identifying and clarifying the issues surrounding the application of operant principles and videotape replay to the treatment of obesity, a partially developed procedure was used preliminarily with three subjects. The first two subjects were two female secretaries (L. B. and L. W.) who had learned of the investigator's interest in weight control and related their desire to enter such a program. The subjects were seen together for approximately 45 minutes, two times a week for twelve weeks. Content of the sessions included instigation of self-monitoring of eating and exercise behaviors, videotape replay of part of each session with discussion about environmental cues to eating, feelings about themselves, and generally "how the program was going." An evaluation was done following the end of the twelve week period. One subject reported that she found the program helpful and was losing weight on an average of two pounds each week. The other subject, however, expressed

lack of involvement and discouragement because she had been unable to meet her goal of weight loss. As a result the program was changed to include: (1) a specific number of structured teaching-therapy sessions; (2) lesson plans and goal sheets were instigated; (3) reinforcement was identified and made contingent upon positive eating practices; and (4) attention, by the therapist, to weight loss was minimized. Both subjects agreed to begin the program again from the beginning, and progressed systematically through the modification of antecedents to eating, the manipulation of the eating response, and the identification and contingent application of reinforcement.

The two subjects and the investigator met together at weekly intervals for another six months. Subjects were then seen individually for an additional one to four months. The problem of the lack of a natural environment that would provide immediate positive reinforcement was noted in one subject who was single and lived alone. For this reason, a contractual system was established with the subject and consisting of the signing of a contract between the subject and one other person. The contract stated that $10.00 would be deposited at the beginning of each month by the subject to be refunded contingent upon the loss of a specified amount of weight. Weight loss was thought by the subject to be directly related to her ability to use the techniques of the program. If no weight was lost the money was given to a charity. The subject found it helpful to be monitored and

reinforced in this way. The role of the subject's natural environment to reinforce the subject's progress was identified as an important variable. It was postulated that a social reinforcer from the client's own social system to give immediate positive reinforcement and to monitor the subject's progress would be a helpful addition to a weight control program.

Another experiment was conducted with a third secretary (L. C.). Upon request, the husband of this subject agreed to come to each session to learn the role of a social reinforcer. Weekly two hour sessions were conducted for a twelve week period with biweekly sessions for an additional twelve weeks. The program of treatment was the same as that described for the previous two subjects except it included attention to ways the husband could reinforce his wife's adherence to the program.

The use of videotape replay and a designated social reinforcer appeared to the investigator to be valuable adjuncts to a comprehensive program of weight control utilizing operant techniques. Weight loss of these three preliminary subjects is shown in Figure 8.

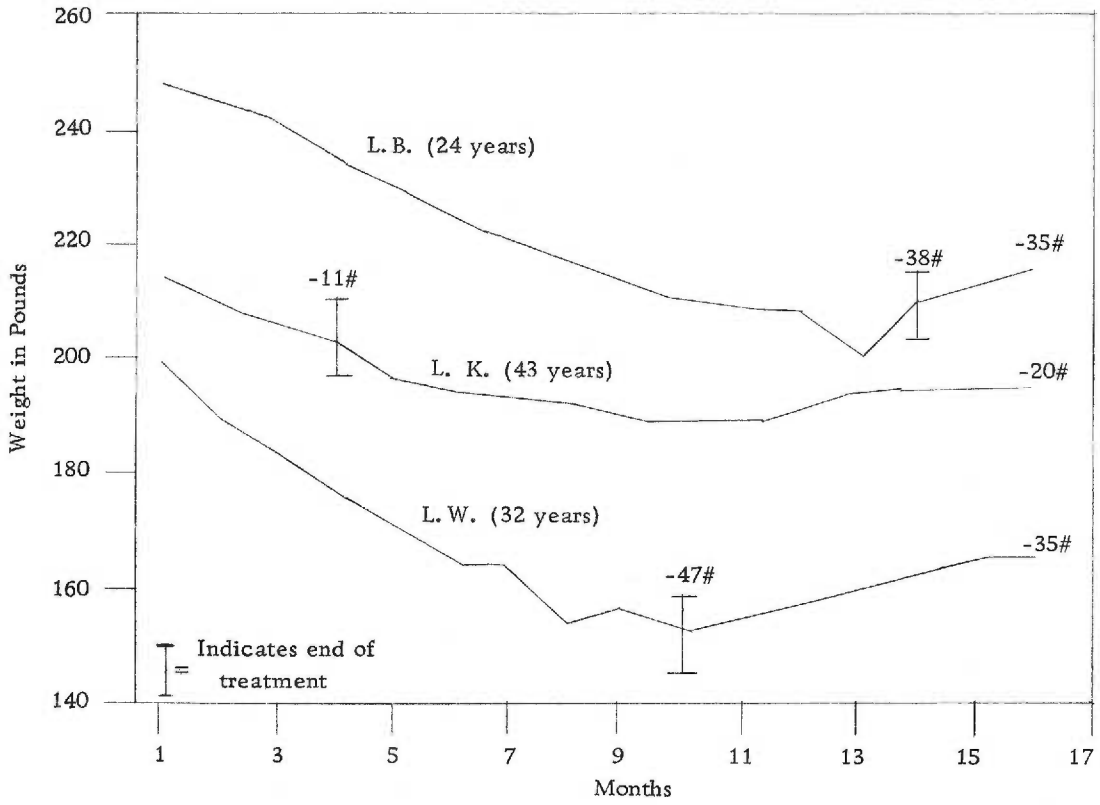

Figure 8. Weight loss of three preliminary subjects.

Design

The general design and procedure is presented in Figure 9. Both client families received the same treatment program. Treatment progressed through four phases: the pre-treatment period, a period of continuous contact, a period of infrequent contact, and finally, a period of complete therapist withdrawal. The pre-treatment period lasted one week. It was conducted to determine the appropriateness of the procedure for the prospective clients and to give the client families sufficient time to decide whether or not they

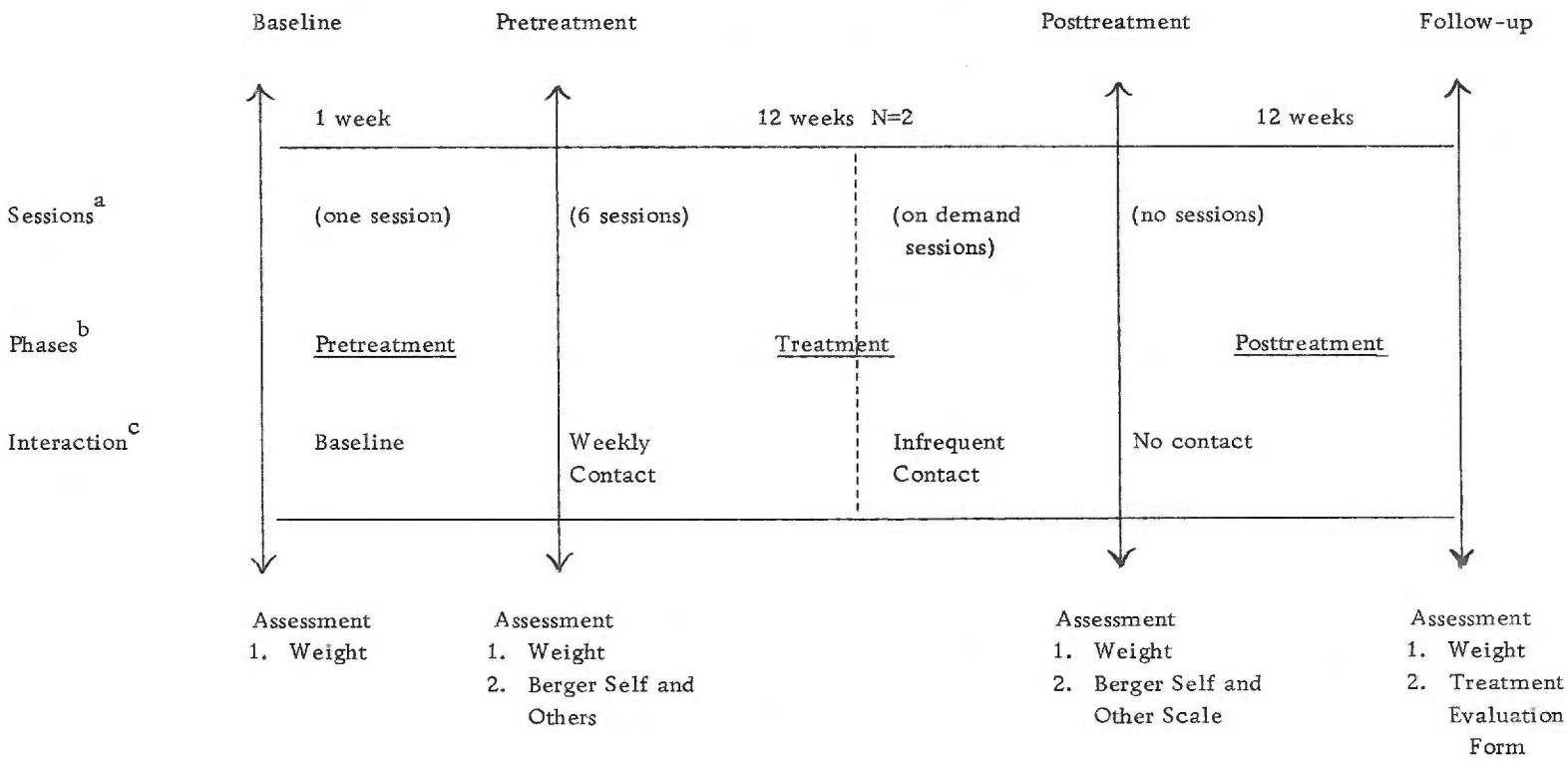

Figure 9. General design and procedure.

[a]indicates the number of sessions designated

[b]indicates the phases of the treatment program

[c]indicates the frequence of therapist interaction with subjects

wished to participate. The continuous contact phase consisted of six weekly sessions of teaching-therapy including: the functional analysis of the clients eating behavior and manipulation of his natural environment to greatly increase the probability that positive eating practices would occur; instruction and manipulation of dietary intake; and the instigation of an exercise program. The treatment period was divided into two six-week periods. Following the initial six weeks of teaching-therapy sessions, biweekly progress to infrequent contact occurred. In this manner, the effect of therapist and therapy reinforcement could be gradually faded while further defining and reinforcing the client's use of the program. The final phase consisted of twelve weeks of no contact, followed by contact for follow-up assessment.

Subjects

The focus of the present clinical investigation on cardiovascular patients was made known to the physicians of the CVE clinic through the use of a letter. Two prospective families were referred to this investigator as possible candidates for participation in this study. The criteria for acceptance in the program were that the person was an adult cardiac patient who had a physician directive to lose weight and was willing to attend the scheduled sessions accompanied by a significant other person.

The rationale and treatment procedures, including the commitment of time, were described to the clients during the preliminary session. The opportunity was then given each client to make a decision as to his willingness to participate. This also gave the investigator sufficient time to determine if for some obvious reason the program would not be appropriate for the client. Details are described under pre-treatment phase.

Subject No. 1

Mr. J. B. was a white, married, 51 year old male, who was being followed in the CVE clinic post aortic valve replacement in 1963, and again in 1968. Mr. J. B. had a history of congenital valve disease with deformity and stenosis of the aortic valve. Mr. J. B. had one previous loss of weight through dieting just prior to his first hospitalization in 1963. He was at his lowest adult weight at that time and weighed 200 pounds. Prior to surgery, Mr. J. B. had been a successful steel mill worker. At the time of the program he worked at the same mill at the switch board. His motivation to begin a weight reduction program was to improve his "marginal class I" functional rating so that he could resume his former position as a heavy laborer. Resuming his former position would increase his retirement income. He also stated he preferred to work at heavy

labor and derived satisfaction from being told he had been "the best steel worker the mill ever had."

Mr. J. B. was 5'11" tall and at the beginning of the program weighed 243 pounds. The weight criteria, based on the U. S. Department of Agriculture Publication 547, Table of Desirable Weights, and estimating Mr. J. B. to have a medium to large bone structure, indicates that he was 48.4 percent over his desirable weight.

Subject No. 2

Mr. H. C. was a 60 year old white, married male, also being followed by the C. V. E. clinic post aortic valve replacement. His was done in 1965. The stenotic aortic valve was replaced with a Starr-Edwards prosthesis to reverse increasing congestive heart failure with accompanied angina. A postoperative embolic episode had left Mr. H. C. with a right hemiplegia. Mr. H. C. was a retired counselor and part-time minister. He had always been heavy, even as a youth, but excess weight only began to be a problem to him when he began to have cardiac symptoms. He had one successful weight loss of twenty pounds in 1969 by self-regulation of diet during a six-month period. He maintained that weight loss for one year and then regained all but eight pounds back. Mr. H. C. was also 5'11" tall and weighed 227 pounds at the beginning of the program. By the

U. S. Department of Agriculture criteria for desirable weights and approximating H. C. to have a medium frame, he was 39 percent overweight.

Table 5. Overview of Two Patients Treated in Study.

Subject No.	Age	Sex	Diagnosis	Percent Overweight
1 (J. B.)	51	Male	Aortic valve repl. '63 & '68	48.4
2 (H. C.)	60	Male	Aortic valve rep. 1965	39.3

Assessment Instruments

Table 6. Assessment Instruments.

Instrument	Purpose	Administered
Bathroom Scale	Measure change in weight	Self-administered: Baseline, daily during treatment, follow-up
Acceptance of Self and Others (Berger, 1952)	To measure attitude change in subjects pre- and post-treatment	Pre- and post-treatment
Evaluation of Treatment Form	To determine subjects' perception about the amount of transfer into natural environment of the behavioral principles	At follow-up

Bathroom Scales

Each client weighed daily on his own bathroom scale and recorded his weight on data collection sheets and later on a graph.

One client, Mr. J. B., changed scales during the program; the change due to the different scale is noted on the chart. Minimal attention was given to amount of weight change. Rather, it was considered to be a natural result of changes in eating behavior and increased caloric expenditure through exercise.

Berger Scale for Acceptance of Self and Others (See Appendix C)

This scale was developed to evaluate what has been clinically accepted: that an acceptance of self is related to acceptance of others. Conversely, it has been suggested that a failure to love one's self is accompanied by a hostility towards others. It was felt to be important to determine these relationships in the teaching situation dependent upon the subject and his spouse becoming increasingly mutually supporting of each other. Further, Blunt and Peterson (1970) have suggested that viewing one's self on videotape has the effect of enhancing self-esteem. This scale was given to give some preliminary impressions of the effect of the present treatment program on self-acceptance and acceptance of others.

The Berger Acceptance of Self and Others instrument is really two scales, one to measure attitude toward self and one to measure attitude toward others. It is administered as a single test. Characteristics of a self-accepting person as defined by this instrument are one who is able to accept praise and criticism, considers himself

a worthy person, relies on internal values as guides for behavior, does not regard himself as abnormal and is not unusually shy or self-conscious. A person accepting of others is characterized as one who does not reject, hate, or judge others whose behavior or standards differ from his own, sees others as equal and worthy, takes an active interest in others and has a desire for satisfactory relationships with others (Berger, 1952, p. 778-780).

Each client and his wife was asked to respond to each item by entering a "1" for "not at all true of myself," a "2" for "slightly true of myself," a "3" for "about half-way true of myself," a "4" for "mostly true of myself," and a "5" for "true of myself." The score for any item ranged from 1 to 5. An item expressing a positive attitude toward self or others was given 5 points to a response "true of myself," 4 points for "mostly true of myself," and continues in a similar fashion. The direction of scoring is reversed for negatively worded items. A total score for each scale is computed by summing the item scores for all items on that scale. A high score indicates a favorable attitude toward self or others (Shaw and Wright, 1967, p. 432).

The scales have been found to have satisfactory matched-half reliability when tested on five groups ranging in size from 18 - 183. These were reported to be .894 or better for the self-acceptance scale for all but one group, which was .746. Similar reliabilities

were found for the acceptance-of-others scale (.776 to .884). The Spearman-Brown formula was then used to estimate whole-test reliability (Berger, 1965, p. 779-780; Shaw and Wright, 1967, p. 432). Considerable evidence has also been found in favor of the scales validity. Construct validity was determined comparing scores of subjects who wrote paragraphs describing attitudes towards self and others with the scale and by comparisons between different groups. Pearson product-moment correlation of validity determined by freely writing of attitudes given ratings, and scores, were .897 for self-acceptance and .727 for acceptance of others. Both of these correlations were significantly greater than zero. The second approach to validity involved comparisons between groups: stutterers with non-stutterers ($p < .06$) on self-acceptance scale; group of prisoners with college students ($p < .02$), acceptance of others scale; and finally speech rehabilitation groups with a clinical assistant group. All correlated scores were found significant with the exception of the speech rehabilitation and clinical assistant group (Shaw and Wright, 1967, p. 433).

Subjective Evaluation of Treatment Program

The Subjective Evaluation of Treatment Scale was devised by the investigator. The purpose was to determine, from the clients' perspective, the helpfulness of the treatment program. Two aspects

were covered: the amount of transfer into the natural environment of the behavioral principles covered during the teaching-therapy sessions, and what the patients felt were the most and least helpful aspects of the program. The scale included four open-ended questions and one question asking the client to rate himself on a scale of 1 - 5. Space 5 indicating the client was presently using the program "all the time"; space 4 "mostly all the time"; space 3 "about half the time"; space 2, "less than half the time"; and space 1, "not any of the time."

A high score was thought to be indicative of the clients' incorporation of the techniques learned during the teaching sessions into his everyday life.

Assessment of weight was done at the beginning of the baseline period, at pre- and post-treatment period, and at follow-up. The Berger Scale for Acceptance of Self and Others was administered pre- and post-treatment. The evaluation questionnaire was given at follow-up.

Videotape Procedure

The first twenty minutes of each session was recorded on videotape. During this time the client read aloud the data he had recorded on data collection sheets the previous week. Additional comments by the client's wife were encouraged. The tape was

stopped and rewound by the technician who had been doing the recording in Room 2 (See Figure 10). The tape was then brought into the interview room and put on a recorder and the monitor turned on. While viewing the tape each participant: client, spouse, and investigator, wrote their observations concerning the specific kinds of information asked for on the work sheet. (See Appendix D). Verbal interruptions of the tape were also encouraged. Objectives for the use of the videotape replay were to:

(1) define the assets and problematic situations and interactional patterns from objective material;

(2) clarify points that were not clear;

(3) point out ways the family member could be an effective reinforcer or ways she was being an effective reinforcer;

(4) provide reinforcing feedback to the client and his spouse;

(5) enable the subject to gain benefit from self-confrontive effect of videotape;

(6) provide repetition to increase learning;

(7) provide the opportunity to deal with feeling states and communication problems as they arose. Assuming that it is difficult to deal with two areas: content and process, simultaneously reviewing the material provided an opportunity to separate the two. It was also assumed that unresolved feeling states make the learning process more difficult.

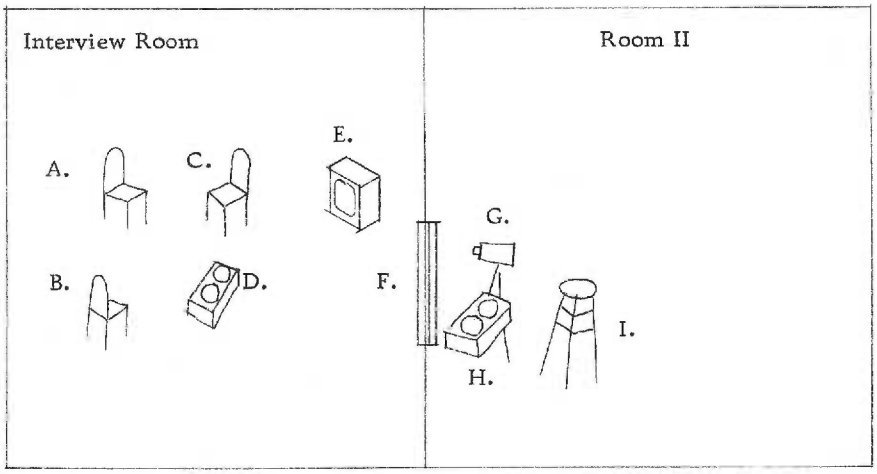

Figure 10. General set up of the interview room and Room II. A: Subject; B: Wife of Subject; C: Interviewer (Investigator); D: Recorder; E: T. V. Monitor; F: One way mirror; G: Camera; H: Recorder; I: Technician.

The Treatment Program

Pretreatment Phase

Subjects were contacted by telephone and personal interview and arrangements were made for a pretreatment introductory session. The objectives of the pretreatment session were to:

(1) allow the prospective participants time to become acquainted with the therapist, therapy setting, and rationale of treatment;

(2) do a diet history to determine clients' motivation, previous dieting history, and any complicating medical, emotional, or socio-economic problems;

(3) introduce the videotape replay tool;

(4) instruct the clients in the use of the baseline data gathering form;

(5) upon the decision of the client families to participate, complete all the necessary forms and the assessment instrument.

All the material was covered and the forms completed (See Appendix B for Diet History Form, Videotape Permit Form, Consent to Participate Form). Clients were instructed in the use of the baseline data gathering form and were asked to record baseline data, while not changing their eating in any way, for seven days (See Appendix D). They were asked to bring these data with them to the first treatment session the following week. Arrangements were made to see Mr. and Mrs. J. B. on each Wednesday from 10 a.m. to 12 noon or from 3:30 to 5:30 p.m. depending on the client's working schedule. Treatment sessions for Mr. and Mrs. H. C. were arranged for Tuesdays from 10 a.m. to 12 noon each week. All sessions were conducted in the Learning Resources Center at the University of Oregon School of Nursing.

The pretreatment session was videotaped. Client families were introduced to the technician doing the videotaping and were encouraged to explore and familiarize themselves with the camera and recorder in the room behind the one way mirror, and the recorder and monitor in the interview room.

A copy of Slim Chance in a Fat World (Stuart and Davis, 1972) was given to each family to read and further acquaint themselves with the rationale upon which the treatment program was based.

Both clients and their wives appeared interested and enthusiastic about beginning the treatment program.

Treatment Phase

The twelve week treatment program was divided into two six week periods. A period of six weekly teaching-therapy sessions (continuous contact), was followed by six weeks of monitoring and reinforcing at infrequent intervals (on demand contact).

OUTLINE OF TREATMENT SESSIONS: Weeks 2 - 7

TREATMENT SESSION I - Antecedents: Environmental Cues to Eating

1. Self-monitoring report (approximately 20 minutes)

   The client read aloud from the data collection forms all the information he had recorded concerning his eating and exercise activities (Appendix D).

2. Antecedents to eating (approximately 5 - 10 minutes)

   A. Overview of the purpose for identifying those situations that happen just prior to or concurrent with eating

   B. Instructions in the use of the sessions' work sheet (Appendix E)

3. Replay and discussion of videotape (Approximately 30 minutes)
   A. Observations concerning eating
      1. Number of times eating occurred
      2. Where eating occurred, posture when eating, recurrent themes
      3. Activities associated with eating
4. Goal sheet (approximately 15 minutes) (See Appendix F)
   A. Suggestions to narrow the stimuli to eating
      1. Eat in one place and position, use specific eating utensils, schedule when eating will occur
   B. Suggestion to interrupt chaining in eating
      1. Make eating a pure activity
   C. Identification of cues that signal or reinforce control of eating
      1. Identify situations the wife can reinforce by making positive reinforcing statements
      2. Model a neutral response to deviations and failures
      3. Identify ways wife can monitor client's eating
      4. List of suggestions that may help eliminate or suppress environmental cues to eating
   D. Identification of exercise goal for the week
5. Kinds and amounts of foods being eaten (approximately 5 minutes)
6. Instructions in the use of work sheet number 2 (Appendix E)

7. Videotape replay and discussion (approximately 30 minutes)

   A. Kinds of foods eaten, recurrent themes

   B. Size of portions

   C. Identification of situations where positive eating practices occurred

   D. Identification of situations that were positively reinforced

   E. Any other observations

Comments, Subject No. 1. Mr. J. B. reported that he did not understand the use of the data collection sheets. However, he had kept very good records in most all the categories on small cards. Mrs. J. B. expressed concern that they had not done their homework "correctly." It was also noted that Mrs. J. B. made apologetic remarks concerning her ability to complete worksheets and to be of any help. Mr. J. B. expressed satisfaction about his ability to collect data.

Information gathered upon replay included: (1) Mr. J. B. rotated between a day and an evening shift, making their eating schedule confusing; (2) frequency of eating: six days he ate two meals per day, one day he ate only one, he drank up to 30 cups of coffee a day, and the first meal of every day was skipped; (3) eating most often occurred sitting when at work and often standing when at home and in front of the TV; (4) recurrent themes of kinds of foods eaten included fried eggs (2-3), toast (3 slices), hash brown potatoes

and often a large slice of ham. Finally, (5) it became apparent that though Mr. J. B. had not been released to do heavy manual labor, he was working from three to five 30 minutes spells at the mill lifting heavy steel from a roller. He was also coming home from work and working into the night painting the inside of their house. These bursts of excessive energy output were spasmodic.

As Mr. J. B. filled in his goal sheet for the week, he indicated he would limit the places eating could occur to the dining room while at work and at the kitchen table when at home. Further, he would eat only when sitting, and with a particular place setting. A schedule for eating times allowing for both day and swing shifts was devised. It included three meals plus one snack. He included an exercise goal of a specified amount of walking up steps. Mrs. J. B.'s goal was to try to prepare the meals on schedule, look up caloric amounts for Mr. J. B. and to gently remind Mr. J. B. of his eating goals. It was observed by all participants that by recording the food eaten it had served to greatly decrease the amount of food eaten by Mr. J. B. during the week.

Comments, Subject No. 2. Mr. H. C. had brought one day's monitoring data to the session and those data had been recorded by Mrs. H. C. The session was conducted in the typical manner, however, using the material that was available.

Observations included: (1) eating normally occurred in the living room on trays and often was associated with watching television or visiting with friends; and (2) the amounts and choices of foods were largely controlled by Mrs. H. C. who was also trying to lose weight. (She regularly attended TOPS.)

The interaction during replay revealed that Mr. H. C. was highly controlling in the home situation. He further stated that while he could see a rationale for eating in the kitchen and making eating a "pure activity," he did not wish to change his eating situation at that point. Mr. H. C.'s goals for the week included: (1) making a schedule of when eating could occur which included three meals and one snack; (2) elimination of prepackaged TV dinners; and (3) bringing a small plate to church social dinners and taking no second helpings. An exercise goal of walking and indoor rowing was recorded. Mr. H. C. asked that Mrs. H. C. reinforce his refraining from second portions by reminding him at the beginning of the meal "this helping is it." She agreed to do this. (Worksheets and goal sheets for each session are included in Appendices E and F.)

TREATMENT SESSION II - Antecedents: Interactional Cues to Eating

1. Self-monitoring report (20 minutes)
2. Antecedents to eating, interactional cues to eating (10 minutes)

A. Overview of the purpose for identifying moods and feeling that precede or are concurrent with eating

B. Instructions in the use of the sessions' work sheet

3. Replay and discussion of videotape (45 minutes)

A. Areas that give the greatest problems

B. Moods and feeling associated with times eating occurred

C. The event that brought about that feeling

D. Can that event be eliminated? Can its effect be decreased? Can something else be substituted when that happens?

E. Other observations

4. Goal sheet (30 minutes)

A. Identification of accomplishments already made

B. Introduction to form for recording the times problematic eating is resisted (Form for Times Eating is Resisted, See Appendix D)

C. Introduction to new form for monitoring daily eating (Appendix D)

D. Specific client goals in relation to interactional cues to eating

E. Identification of client exercise goal for the week

F. Identification of way for wife to reinforce client's positive eating practices.

Comments: Subject No. 1. Mr. J. B. again brought to the session very complete data on the Data Gathering Form of the week's

eating and exercise activities. He obviously felt good about his ability to keep records and his decrease in weight. During video replay the feelings of both Mrs. J. B. and the client about Mrs. J. B.'s acute problem of sleeplessness and depression were discussed. Mrs. J. B.'s psychological problem was noted also to relate to the many meals eaten away from home, or picked up from "quick-fix" restaurants such as Taco House, Kentucky Fried Chicken, food machines at work, and so forth. It not noted by Mr. J. B. that the Chinese food eaten during the week was the result of a lack of honest communication between the two of them. Mr. J. B. suggested to his wife, "From now on, if you don't want something, say so, and if I don't want it I'll say so; let's be honest with each other."

The client was noted to have included a fruit for breakfast with his coffee and felt good about his accomplishment stating, "I may get to like it." Mr. J. B. was noted again to have consumed an extraordinarily large amount of coffee. A plan was devised to help Mr. J. B. resist food from food machines at work (a low frequency behavior) by substituting a cup of coffee when he had an urge to get the food. The client was asked to try the plan for a week. It was also suggested that he increase his caloric intake during scheduled eating times in view of his high energy expenditure and feelings of hunger. No specific exercise goal was made, however, the client was encouraged to continue the good job of recording carefully his energy expenditure.

To assist Mrs. J. B. in fixing meals at home, it was suggested to her that she keep a list throughout the week of things that would make it easier for her to fix meals, i. e. grocery shopping, knowing what to fix and so forth. Her reply was, "It's just that I'm so tired." At this point, Mrs. J. B. looked to her husband who did not respond to her but looked down at the floor.

It was speculated by this investigator that the frequency with which Mrs. J. B.'s sleep problem was brought up during the sessions were indicative of a long standing psychological problem. It was noted that she was being seen at regular intervals by a psychiatrist for these symptoms. This investigator made the decision that the focus during the present therapy program would be to reinforce Mrs. J. B. strongly for any active role she played in Mr. J. B.'s program and to encourage mutual reinforcement between the two of them. Investigation into the causes of Mrs. J. B.'s more involved problems would only be done in relation to the therapy goals of the weight reduction program.

Comments: Subject No. 2. Mr. H. C. began the session by reporting that they had progressed in limiting the kinds of foods served to guests when they came by for coffee. Record keeping was again done by Mrs. H. C. During the replay of the videotape, Mr. H. C. made the comment in relation to getting the needed information on the sessions' work sheet, "I've got to watch what I eat." His

comment led to a discussion of how this could best be accomplished. Included in the discussion was the long history of a behavior pattern where Mrs. H. C. felt it her duty, even though a "burden," (Mrs. H. C.'s word) to take care of all of Mr. H. C.'s eating needs, including his need to lose weight. The positive and negative aspects and feelings of such an interactional pattern were examined.

This investigator noted that Mr. H. C. remained in control of situations both in the home and in the teaching sessions largely by passive resistance. By not responding to distractive comments made by Mr. H. C. the researcher noted that the frequency of the distractions sharply decreased. This attempt was recognized by Mr. H. C. and were interpreted by him to show that the investigator was "really interested in helping him achieve his goals."

Mr. H. C. identified that tempting foods were often confronted while shopping, an activity frequently used for both diversion and exercise. Mr. H. C. suggested shopping from a list would be helpful in reducing the effect of this cue. The specific goal for the week included keeping a record of the times Mr. H. C. succeeded in staying within his caloric limit. Mrs. H. C. suggested that she would continue to reinforce her husband's successes verbally, also continue to help him find caloric amounts for foods.

TREATMENT SESSION III - Antecedents:
States of Deprivation

1. Self-monitoring report (20 minutes)
2. Antecedents to eating, control for states of energy, food, and stimulus deprivation
   A. Overview of purpose for identifying states of being deprived when the value of food is automatically increased and patient is more likely to eat
   B. Instructions in the use of the sessions' work sheet (5 minutes)
3. Replay and discussion of videotape (45 minutes)
   A. Examples of times when especially hungry and probable cause
   B. Examples of times especially fatigued and probable cause
   C. Examples of being bored, emotionally upset or uneasy
4. Goal sheet (3 minutes)
   A. Re-explanation and examples of what is meant by states of deprivation
   B. Calculation of average caloric intake versus the average caloric expenditure to determine if client is getting sufficient calories
   C. Goals in relation to caloric intake versus energy expenditure, optimum amount of rest, non-food alternatives to eating when stimulus deprivation is present.
   D. Goal for social reinforcer

Comments, Subject No. 1. Mr. J. B. came to this session alone, stating his wife was sorry to miss the session, but remained home because she had the flu. In reviewing his data for times of energy deprivation, Mr. J. B. observed that he usually got sufficient sleep, but did get tired occasionally while at work and when working with his mobile home and boat. Lack of sufficient non-food interests did not appear to be a problem at this point. During videotape replay of this session, Mr. J. B. offered at length his feelings and concerns during and since his open heart surgeries in 1963 and 1965. He related his concern that what had happened to him was somehow related to his wife's present problem of depression. He also stated he felt a need to protect himself at all times (always kept a length of chain with him) and an inability to control his feelings of "instant anger." This was the only session he ventilated freely and at length about feeling states. It was noted that Mr. J. B. had not substituted cups of coffee for times he felt a need to eat. However, he began to count the number of cups of coffee per day and found he could decrease coffee consumption in this way.

Mr. J. B. was urged to increase his caloric intake to at least 1300 calories per day and it was shown to him from the calculation of his specific caloric need that he would lose at least 2 - 3 pounds each week at his present level of energy expenditure.

Comments, Subject No. 2. At the beginning of the session it was evident that Mr. H. C.'s attitude toward record keeping had changed. He began to read his well kept and complete data proudly, pointing out his successes. He denied, however, that he felt deprived in any fashion and stated he was mostly interested in changing social eating practices. Upon replay of the videotape the phrase from the data relating Mr. H. C.'s "agonizing experience with hunger" was examined for its predisposing cause. Mrs. H. C. helped greatly in urging Mr. H. C. to explore ideas of how to handle times when "you just want to throw in the towel" (quote from Mrs. H. C.). Mr. H. C. stated he would do an activity outside such as go for a walk or work on his car. Food and energy deprivation were reviewed and it was noted that meals were being eaten regularly and were sufficient calorically to prevent hunger. Exercise and social reinforcement goals remained the same and were recorded.

TREATMENT SESSION IV - The Eating Response and Consequences

1. Self-monitoring report (20 minutes)
2. Response, manipulation of eating itself
   - A. Overview of rationale
     1. To instruct the client that he can control the way he eats in much the same way that he has manipulated the environment to help control when, where, and how much

he eats

2. Slow the pace of eating

3. Enjoy what is eaten more

3. Consequences of eating

A. Overview of purpose in identifying and increasing positive consequences to positive eating practices

1. Introduction to feedback of own behavior via daily eating, exercise, and weight graph (see Appendix D)

4. Replay and discussion of videotape (45 minutes)

A. Identification of events that set the stage for desirable eating

B. Identification of events that follow positive eating practices

C. Who controls those events, self or other

5. Goal sheet (15 minutes)

A. Written explanation of antecedents, response, and consequences in regard to eating

B. Suggestions for slowing the eating response

C. Practice in recording on the daily eating, exercise and weight graph.

D. Assignment to read about token reinforcement systems in Stuart and Davis, Slim Chance in a Fat World, pp. 32-37.

E. Review of exercise level

F. Review of social reinforcement goals

Comments, Subject No. 1. The focus of this session was to identify the positive practices that the clients had acquired and to identify the situations that were working well for them, particularly in relation to the role of the wife as social reinforcer. Positively reinforcing and monitoring the client's progress by the wife of the subject was conceived to be one of the major cues to positive eating practices. It was also important in changing the natural environment of the subject in such a way as to maintain positive eating behaviors. Mrs. J. B. identified that maintaining caloric limits in the lunches she fixed for her husband and her assistance in keeping records were helpful. Mr. J. B. complimented her for her assistance.

Comment, Subject No. 2. Mr. H. C. had become increasingly involved in his program and was asking less assistance from Mrs. H. C. During video replay in this session an eating situation that had been nicely handled was discussed. It was noted that Mr. and Mrs. H. C. were mutually reinforcing each other, she for her good planning of meals, and he for assuming the responsibility to weigh and measure his own intake. It was also noted that Mr. H. C. was cuing others of his desire to maintain positive eating practices.

For both clients a graph was made during the session, using the data from the previous week. Goals for the week were devised in relation to the keeping of the graph.

TREATMENT SESSION V - Nutrition

1. Videotapes on nutrition played and discussed
   A. Review of basic food groups
   B. Information about the effect of cholesterol, triglycerides, glucose and fats in the diet
   C. Explanation of exchange food plan and use of plastic folder[1] (Appendix page D)
   D. Assignment of caloric intake value consistent with a weight loss of approximately 2 pounds per week
   E. Evaluation of the level of subject and spouse understanding through the use of programmed test[2]
   F. Practice recording dietary intake on exchange food plan folder

Comments: Subjects No. 1 and No. 2. Stuart and Davis (1972) make the point that the best way to replace a problematic cue is to replace it with a strong cue to positive eating (p. 99). For this reason attention was given to influencing and educating the client families in positive food choices. This session was conducted in a lecture-discussion mode using videotapes made earlier by two dietitians presenting material on basic nutrition and nutrition and heart disease. The informal manner of the discussion allowed for replay of difficult

[1,2] The Exchange Food Plan and Programmed Test were taken from Richard Stuart and Barbara Davis, Slim Chance in a Fat World, Research Press Co., Champaign, Illinois, 1972.

portions and stopping the tape frequently prompted questions and discussion of points of interest to the clients. The information concerning the relationship between dietary ingestion of cholesterol and blood levels of cholesterol was of interest to Mr. J. B. He noted that although he was on a cholesterol lowering medication he had continued to consume large numbers of eggs and shell fish. Both Mrs. J. B. and Mrs. H. C. were already using polyunsaturated oils and this was reinforced. Mr. H. C.'s special needs for increased amounts of potassium and decreased sodium intake were recorded on the goal sheet in terms of foods that were most desirable for him. Dietary information presented by "authorities" in the field of nutrition appeared to have a highly persuasive effect and was well received.

The programmed test was done well by both client families. Included were questions such as:

> An energy deficit of approximately 3,500 calories will result in the loss of one pound of body fat for energy. This deficit may be established through a decrease in caloric intake an increase in energy expenditure, or a combination of the two. If you wish to lose one pound of body fat in a week your total daily food intake must be ____ calories less than you actually need. Answer: 500 (Stuart and Davis, 1972, p. 152).

Other questions related to recognizing the amounts and kinds of foods included in each type of food exchange category.

Both clients were found to be keeping the daily food, exercise, and weight graph. It was further suggested that an adoption of a token

exchange system to increase positive reinforcement might be tried. Mr. J. B. stated that when he wished some new article he would simply "go out and buy it" and that earning things he wanted by way of tokens would not be meaningful to him. Mr. H. C. stated that the reciprocally reinforcing system established between him and his wife was more rewarding to him than the earning of material things.

Food intake from the previous week was recorded on the food exchange plan folder to make certain each client understood the exchange concept. Daily recording of eating and exercise behavior was then phased out. Clients were urged to maintain self-monitoring behavior by use of the exchange food plan folder for immediate feedback, and the daily eating, exercise and weight graph for daily feedback of his progress.

TREATMENT SESSION VI - Exercise

1. Self-monitoring report (verbal) (approximately 20 minutes)
   A. Review of daily graph and exchange food plan folder
      1. Attention to number of minutes of moderate exercise each day
2. Exercise Program
   A. Overview of the purpose of planning an exercise program and how the exercise behavior will be maintained (reinforced)

3. Replay and discussion of videotape (40 minutes)
   A. To review the purpose of the session
   B. Apply to clients' own situation
4. Goal sheet (45 minutes)
   A. Assessment of number of calories the client is expending in moderate or heavy exercise (ave/day)
   B. Suggestions to implement and maintain exercise program
   C. Client exercise program
5. Plan for fading of therapy sessions
   A. Additional sessions - further apart
   B. Reporting by mail
   C. Plan for follow-up session

Comments: Subject No. 1. Mr. J. B. maintained a high level of energy expenditure through-out the time of the teaching sessions. Because he was classified as a marginal functional Class I cardiac patient, one important aspect in relation to energy expenditure was considered to be evaluation of the average amount of energy expended in exercise. The focus of this session was to plan for a consistent and even amount of additional activity each day. These activities could then be maintained into the fall and winter months and help prevent damage from periodic heavy exercise. Some interest was shown by Mr. J. B. in a graduated program in swimming and stationary cycling. A program based on Copper's (1970) The New Aerobics

was suggested to him. Since no plan was implemented it was agreed that this would be one aspect to discuss again during one of the two follow-up sessions.

Comments: Subject No. 2. Mr. H. C. informed this researcher that this session would be the last session that he and his wife could attend because plans had been made for an extended summer vacation. Mr. H. C. had become more interested in exercise intellectually and read several articles on the subject. He had increased walking and light physical exercise (exercise level 3, expending approximately 1.4 calories per pound body weight per hour) from an average of one hour per day to four to six hours per day. He also reported feeling better generally. He stated he wished to set up a regular exercise program after the summer vacation.

MONITORING AND MAINTENANCE: Weeks 8 - 13

It was considered important by the investigator that the client families withdraw from the teaching-therapy sessions gradually. The therapy sessions were felt to be reinforcing in themselves as they provided time and attention for self-monitoring behaviors, maintaining desirable eating practices, and for reinforcing the social reinforcer. Subjects were told that sessions would be arranged at their request. Mr. and Mrs. J. B. arranged for two sessions during this last half of the 12 week treatment period at

intervals of two and four weeks apart. A system of reporting via mail was devised for both subjects. Weekly written reports of the subject's weight, number of days per week caloric intake was maintained at their optimum level, and number of days per week that at least an hour of moderate exercise was engaged in was sent by the clients to the investigator.

The two additional sessions with Mr. and Mrs. J. B. reviewed progress in the maintenance of a continued reduction in caloric intake and record keeping. Mr. J. B. was found to be maintaining his earlier weight loss and keeping good records. A plan was devised by Mr. and Mrs. J. B. to walk together each evening on a regular basis. This was generally unsuccessful. The time and energy needed to involve oneself in the present treatment program were reported by Mr. J. B. at the last session. His feeling was acknowledged by the researcher and he was complimented on his effort.

Summary of the Treatment Program

The twelve week treatment program was conducted in two phases: a period of continuous contact at weekly intervals for six weeks was followed by six weeks of infrequent contact at the client's discretion and monitoring via mailed reports. The general model of treatment during the weekly contact period followed that suggested by Stuart and Davis (1972). Environmental and interactional situations

that acted as cues for problematic eating were identified in order to eliminate the cue or suppress the effect of the cue on the individual. States of deprivation, when the strength of the eating response normally increases, were controlled. Meanwhile, situations that cued positive eating practices were also identified. The strength of the desirable eating practice response was increased by manipulation of the client's environment to bring about more frequent and more immediate positive consequences for positive eating behavior. There were two major components of strengthening positive cues to eating. These were to teach a member of the client's own family to positively reinforce desirable practices and to give information regarding positive food choices. Negative consequences included weighing four times a day to bring the ultimate consequence (overweight) nearer the intake of food. Weighing also became a positive consequence as the clients' weight was reduced.

Record keeping by the client provided necessary feedback that acted to reinforce the clients' desirable practices and provided the informational content for the teaching sessions. Dietary education was conducted and an optimum caloric intake food plan was instigated that allowed each client to expect to lose an average of two pounds per week. Exercise was assessed throughout and an exercise regimen was introduced.

Posttreatment Phase

No contact was made with the client families following the end of the treatment period. They were seen by the investigator for a short period approximately six months later at the time of a regularly scheduled CVE Clinic appointment. At this time weight was noted and they completed the Evaluation of Treatment Form.

CHAPTER V

RESULTS AND DISCUSSION

Introduction

The present multifaceted program was a behavioral approach to obesity. The implications are that the problematic eating behaviors are maintained by the interaction of the individual and the relevant persons and situations in his environment. The focus of therapy was to identify and employ those same social situations to become beneficial to the client in such a way that weight would be lost. The development of the program and the procedure applied to a client population of associated high risk disease has been described. Results of the present study will be discussed in terms of the general effectiveness of the program, differences noted in clients' eating behaviors, problems encountered, and aspects that may make the procedure more effective in the future.

Participation

All treatment times for the continuous contact phase were scheduled at the preliminary assessment session. During the six weeks initial teaching sessions of the treatment time, there were no changes or cancellations and only one person, Mrs. J. B. did not

attend every session. This almost perfect attendance rate reflects the interest and the involvement of the patient families in the present study.

The Effect of Treatment on Weight Change

The goal of the treatment program was to effect weight loss. The changes in weight and the rate of weight reduction are represented in Table 7. Mr. J. B. attained a weight loss of twenty-five pounds, a reduction of 14.7 percent; and Mr. H. C. attained a weight loss of twenty pounds, a change of 12.3 percent, by the end of the three-month treatment period. Stuart and Davis (1972) state a weight loss of one to two pounds per week is safe and desirable. The rate of weight loss averaged 1.7 pounds per week for Mr. H. C. and two pounds per week for Mr. J. B. At follow-up, three months following completion of the trial period, Mr. J. B. had regained one pound while Mr. H. C. continued to lose up to ten pounds.

Table 7. Weight Change During Treatment and Follow-Up.

Subject	Baseline	Treatment			Follow-up	
	Weight Pounds	Pre % Overweight	Post	Weight Loss Pounds	Percent Overweight	Weight Loss or Gain
Mr. J. B.	243	48.4	33.7	25	33.8	+1
Mr. H. C.	227	39.3	27.0	20	14.7	-10

The effect of the present treatment upon weight loss can also be seen in relation to the patient's previous weight and dietary history while being followed at the hospital where the study was conducted (Figure 11 and 12 and Figure 13 and 14). The hospital charts of both patients revealed that admonitions to lose weight had been given by physicians several times during the years previous to the intervention of the present study. Mr. J. B. had made no concerted attempt to "diet," however, did lose weight following a second replacement of the aortic valve in 1969. By "watching his diet," Mr. H. C. successfully lost twenty pounds in 1969, later to regain all but eight of the twenty pounds.

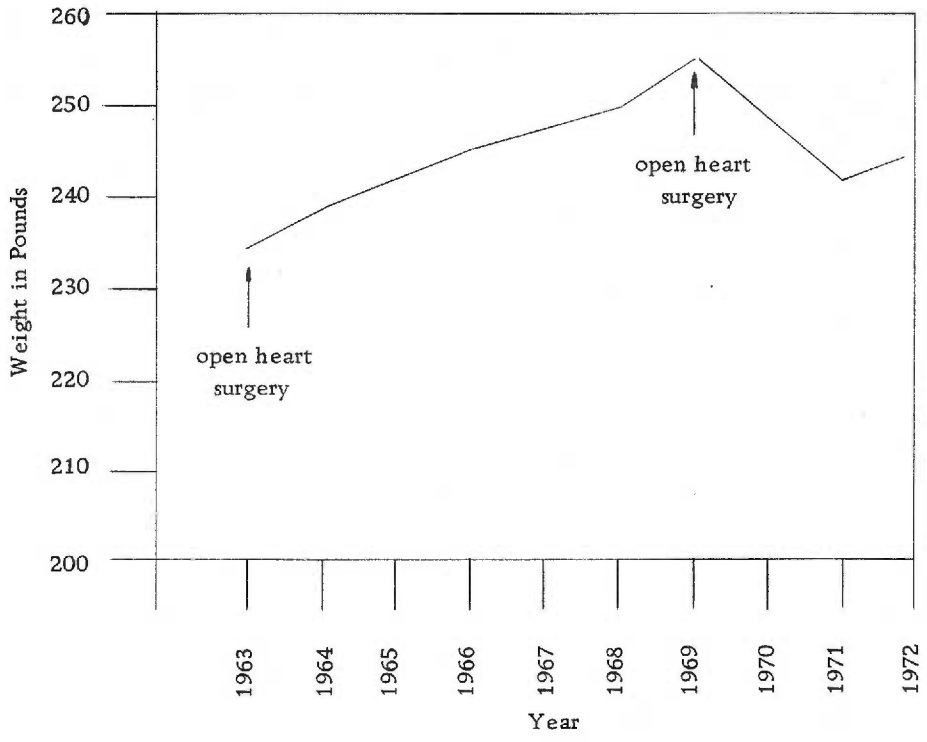

Figure 11. Documentation of the weight of Mr. J. B. during nine years previous to treatment intervention.

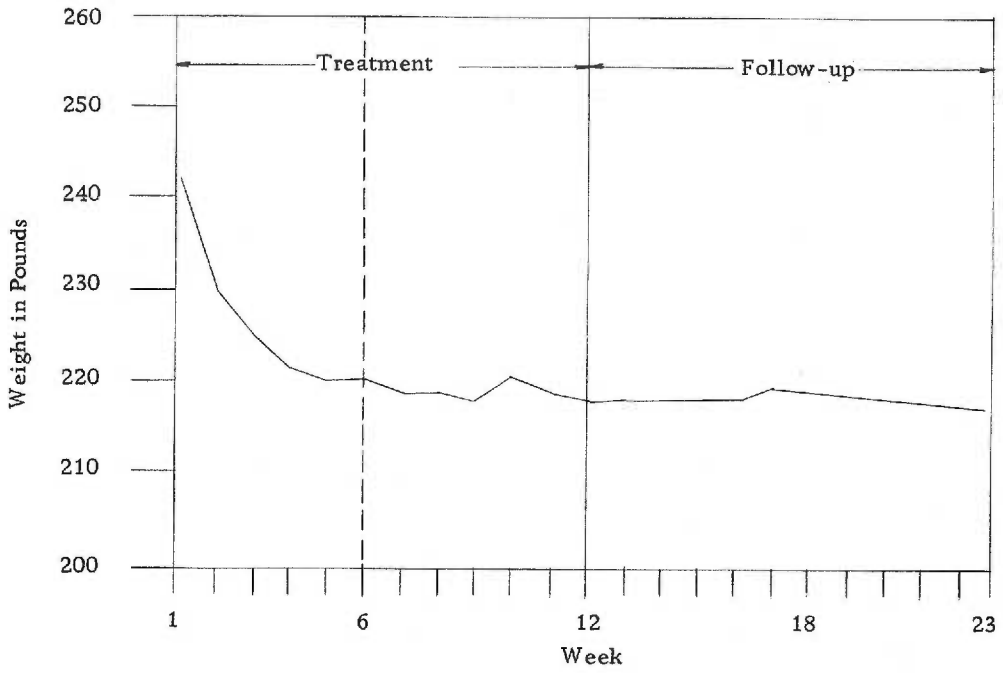

Figure 12. Weight change during treatment and follow-up, (J. B.).

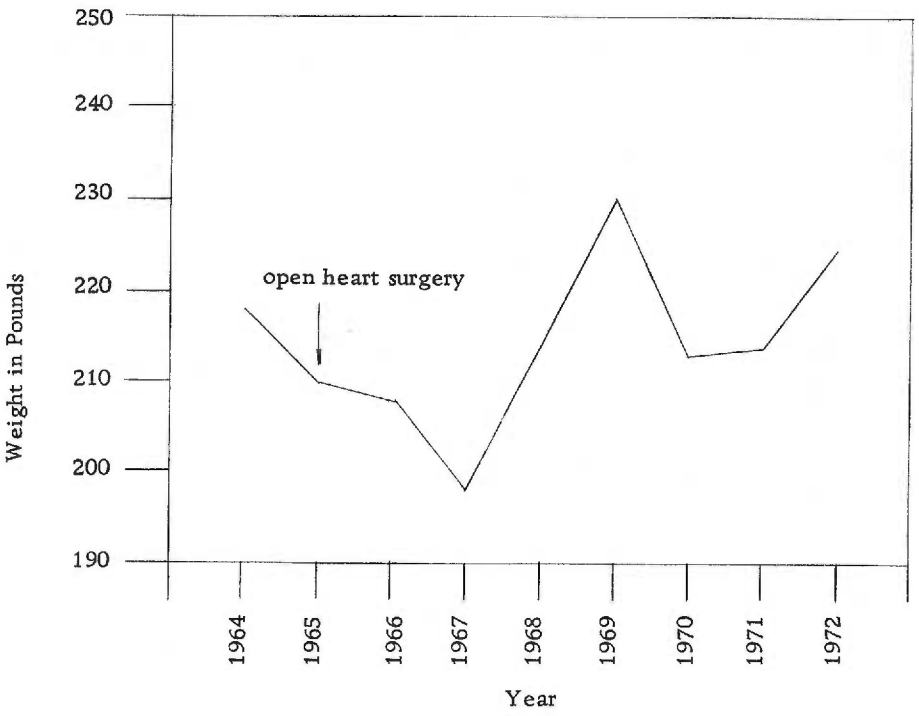

Figure 13. Documentation of weight of Mr. H. C. during nine years previous to treatment intervention.

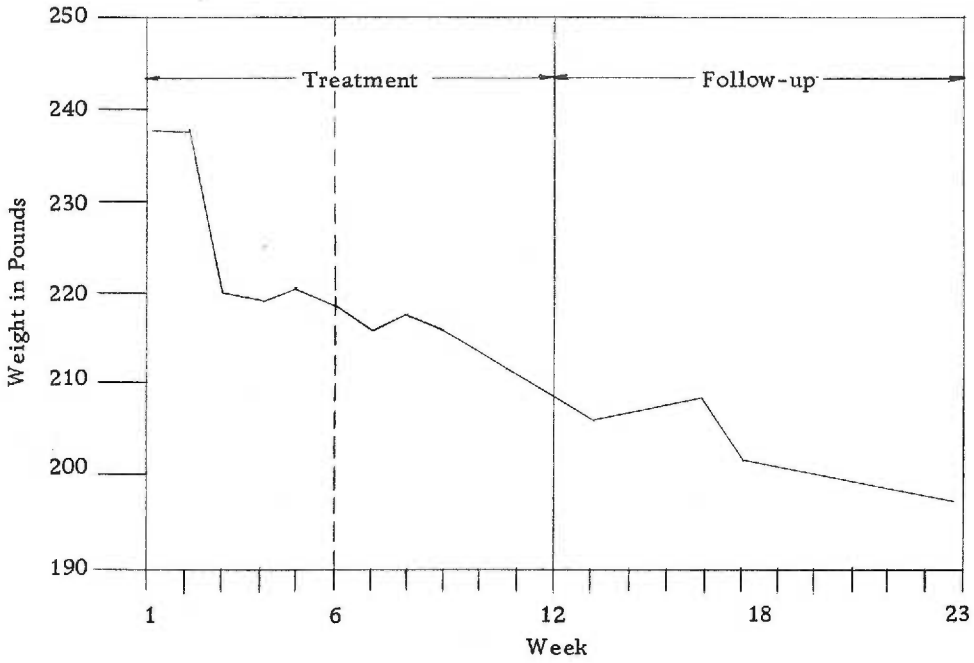

Figure 14. Weight change during treatment and follow-up (H. C.).

Rate and amount of weight change compared favorably with some of the best results reported in the literature (Wollersheim, 1968, Stuart, 1967, and Penick, 1970). Stuart reported an average weight loss per patient over twelve months of 36.25 pounds or an average of 9.06 pounds for three months. Wollersheim reported her subjects lost an average of 10.33 pounds per three months. Her findings, she states, "are the most carefully validated and successful results obtained by the psychological treatment of obesity to date" (Wollersheim, 1968, p. 472). The clients in the two case studies presented lost an average of 22.5 pounds per three month period.

This may suggest that the addition of videotape replay to a behavioral program modeled after that of Stuart and Wollersheim may make the program stronger. It should also be noted that like Stuart's subjects, the sample was representative of obese persons who had been obese since childhood or adolescence, were of predominately mesomorphic body structure, had considerable degree of obesity, and had had previous attempts at weight loss. It should be noted however that both patients were highly motivated and attuned to expecting sophisticated medical care from the University health care system. Mr. H. C. and his wife traveled 100 miles once a week to attend each session. Mr. J. B. was highly motivated in relation to his work goals. Both clients in this study were men. Harris (1969) found some tentative evidence to show that perhaps men "are more likely to lose weight than women independent of original weight" (Harris, 1969, p. 266). Most studies have dealt with predominately women (Wollersheim, Penick, Stuart). The effect of sex on this experimental treatment needs further investigation.

Change in Eating Behavior

Since the focus of the therapy involved changing eating habits, an important question is whether or not changes in eating practices could be demonstrated. Since no assessment instrument was used, only inferences of change in behavior can be made. (An instrument

to assess change in eating patterns behavior is in preparation by J. P. Wollersheim but was not available for use in this study.) One measure that strongly reflects the cueing and reinforcement of positive eating practices was the patients' self-monitoring behavior. Figure 15 represents the number of days per week each client monitored his eating behavior through the use of a monitoring form, graph or by marking an exchange plan on a plastic folder. Figure 15 indicates that the self-monitoring behavior of Mr. J. B. was consistently high until the point of his vacation from work when he discontinued mailing weekly data reports to the researcher. Record keeping behavior demonstrated by Mr. H. C. improved from none at all in the first two weeks to be consistently high during the rest of the initial teaching sessions. It then became spasmodic. Weeks when self-monitoring behavior was high were associated with a decrease in weight and later to the maintenance of weight loss. The acquisition of self-monitoring behavior was one of the most obvious behavior changes noted. The formal recording of aspects of eating behavior such as frequency, rate, and associated events brought about an awareness of his own behavior to which each client was highly reactive. Further, Johnson and White (1971) suggest that "studies in learning have clearly demonstrated that knowledge of results can have important behavioral effects" (Johnson and White, 1971, p. 488). One such effect appears to be information feedback

and self-evaluation. Mahoney (1973) and Romanczyk, et al. (1973) report findings that self-monitoring techniques are more effective than all other behavioral procedures in producing immediate weight loss. The sharp initial decrease in intake by the clients in the study probably reflects this effect, along with that of a change in the kind of food eaten. A decrease in carbohydrate foods and concurrent loss of fluids is a common finding in most dieting procedures.

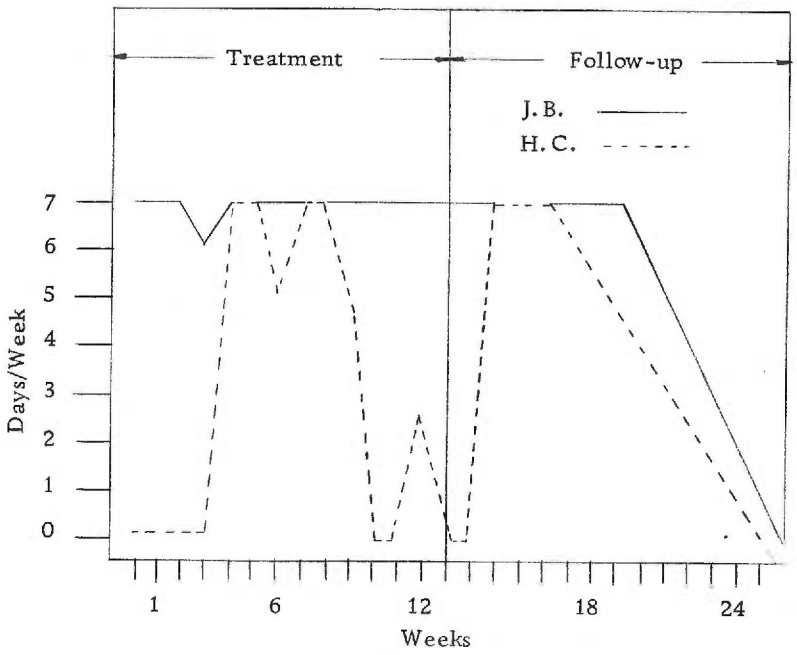

Figure 15. Number of days during each week clients recorded data concerning their eating behavior.

One other strong cue to positive eating practices and for the maintenance of those practices was instruction concerning optimum quality and quantity of positive food choices. Figure 16 appears to

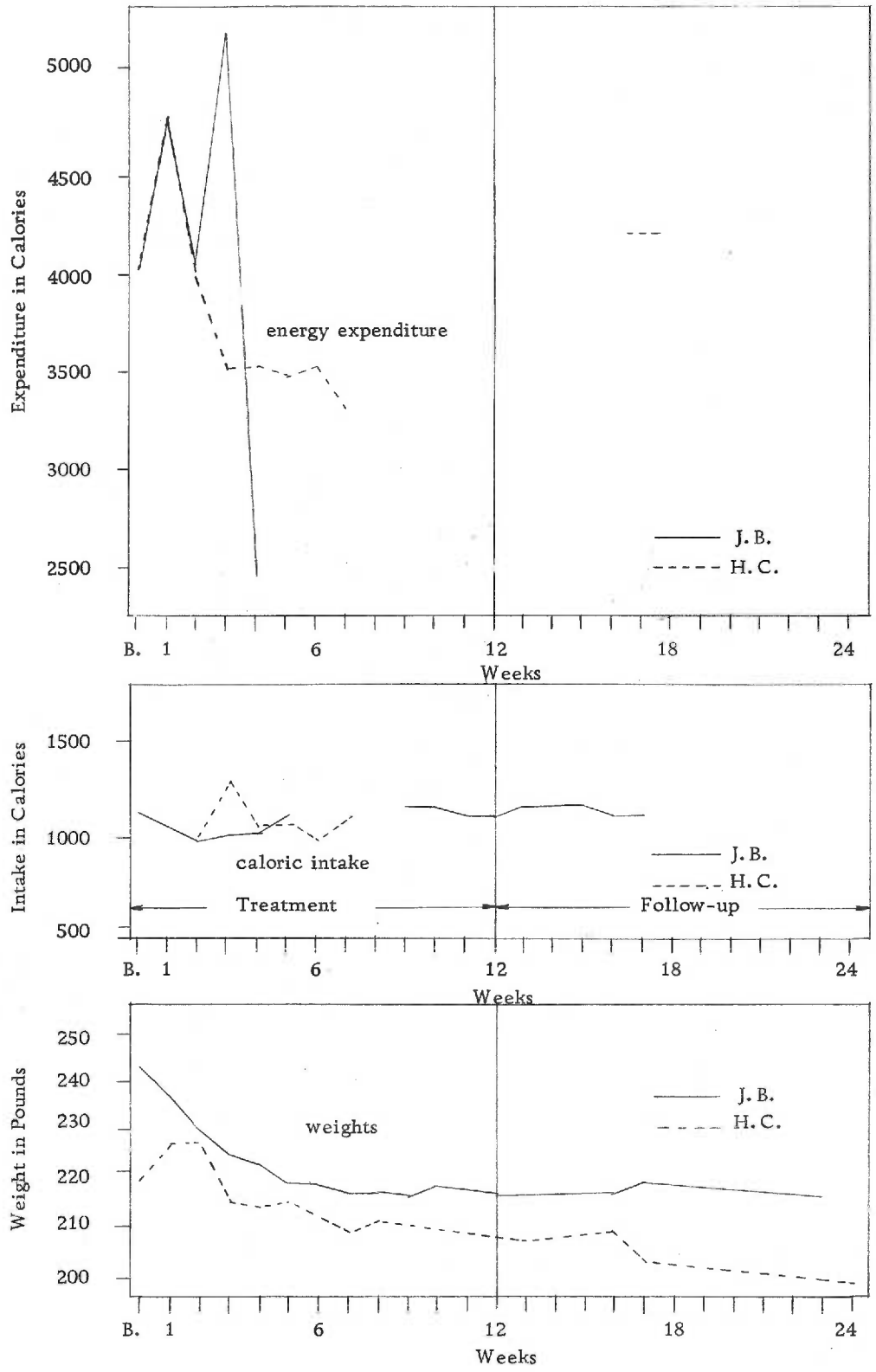

Figure 16. Weight loss in relation to caloric intake and caloric expenditure.

indicate that weight loss can be shown graphically to relate to a maintenance of a decreased caloric intake and an increased expenditure through activity.

This part of the program's focus was on initiating a calorically balanced diet containing no less that fourteen percent protein, (excluding foods high in cholesterol), thirty percent fat, (with a decrease in saturated fats), and fifty-six percent carbohydrates. The relationship of glucose to the production of cholesterol and to reduce the availability of its caloric content for the accumulation of adiposity was stressed. Apart from being nutritionally balanced, an adequate amount of protein was emphasized for its effect on satiety (Yudkin, 1972). Also, a portion of the caloric content of protein is used in its own metabolism leaving a smaller amount to contribute to adiposity (Stuart, 1971). A mild restriction of sodium, allowing some salt in cooking, but no salty foods and no salt on the table, and foods high in potassium were included for Mr. H. C. who had associated dysrhythmia and hypertension. The evidence of increased incidence of certain cardiovascular disease to a high intake of glucose was related.

Another component in the present treatment program was physical activity. The patients in the study differed in that one patient averaged a moderate to high physical activity level while the other patient averaged from low to moderate. The intake of large amounts

of food following strenuous periods of work by Mr. J. B. was contrasted by a decline of food intake shown by Mr. H. C. as he moved from low to moderate levels of activity. The assessment of the clients' energy expenditure through physical activity was used in the calculation of the optimum caloric intake and to bring into the clients' awareness what his physical activity needs might be. In the future use of this program, an exercise regimen, prescribed and programmed to individual tolerance and systematically reinforced would greatly improve the clients' control of this component of the program. Also, there are impressive reasons why operantly reconditioning exercise behavior is important: (1) vigorous activity has been demonstrated to lower levels of certain fats circulating in the blood (Oscai, Patterson, Bogard, Bick, and Rothermel, 1972); (2) high blood pressure is associated with cardiovascular disease and physical exercise may exert a helpful benefit in this condition; (3) exercise may exert a directly beneficial effect on the arteries and vessels of the heart as well as developing extra circulation routes or increasing circulation (Copper, 1970; and finally, (4) patients report an increased sense of well being that is related to physical activity.

How the Present Study Was Different From Other Behavioral Studies

Videotape replay was incorporated into the treatment program to facilitate the teaching therapy and to specifically train the client's

wife to be an effective social reinforcer. No other study was found in literature that had used this approach. The background for the use of this tool developed primarily from studies done by Kagan who found that involvement of clients in the videotape replay process greatly accelerated and enhanced learning.

An instrument to measure client progress and a comparative study without social reinforcement training would be desirable during the future use of this program. Subjective observations concerning the use of videotape replay include: (1) it keeps the therapy situation objective, problem solving is done, not around what someone "thinks" is going on, but what can be seen, heard, or is written down; (2) client families often point out information about their own behavior that the researcher would not have been aware was important and would ordinarily have missed; (3) client families are remarkably casual and at ease around the use of the equipment; (4) early in the therapy clients were found to write down their observations while later they freely stopped the replay to offer comments verbally; (5) video replay is a powerful reinforcer, e.g. reading an account of daily recording of data for twenty minutes, and the ability to view an early film and note the change in body form; (6) it is a relatively easy and versatile tool to use for both the client and the researcher; and (7) it helped to make the sessions interesting for all participants.

Berger Acceptance of Self and Other Scale

The purpose of including this measurement instrument was to determine if a relationship could be demonstrated between the present behavioral program which included viewing oneself on videotape and attitudes towards self and attitudes towards others. It was assumed that a more positive attitude towards oneself and thus towards others would have a beneficial effect on learning and maintaining new behaviors in relation to eating.

Berger presents the means and standard deviation scores for various groups upon which this scale was tested for validity and reliability.

Table 8. Means and Standard Deviations for the Various Groups.

Group	Self-Acceptance			Acceptance of Others	
	N	Mean	SD	Mean	SD
Day-Session College Students	183	135.50	22.36	105.15	14.38
Evening-Session College Students	38	142.63	13.43	106.39	14.87
Prisoners	33	128.45	23.09	101.30	12.89
Stutterers	38	141.36	27.70	111.45	10.79
Speech Problems at Univ. of Pittsburgh	7	116.43	11.30	98.00	10.90
Adult Class at Y.M.C.A.	18	128.77	26.57	112.38	11.83
Counselees	3	102.00	10.71	100.33	7.45

Note: Reprinted from Berger, E., "The Relationship Between Expressed Acceptance of Self and Expressed Acceptance of Others," Journal of Abnormal and Social Psychology. 47:782, 1952.

To show changes in acceptance of self and others, pre- and post-test scores were compared.

Table 9. Means and Standard Deviation for Subjects and Wives.

	Self-Acceptance		Acceptance of Others	
Administered N=4	Mean	SD	Mean	SD
Pretreatment	138.25	12.57	108.25	10.68
Posttreatment	133.25	16.58	112.00	9.08

Patient and wives scores on the Berger Self and Others Scales were noted to correspond with those of the "Adult Class at Y. M. C. A." This group, tested by Berger, could be assumed to be on a similar age to the subjects of the present study.

No firm conclusions can be drawn from the small sample tested. However, subject and wives pre- and post-treatment scores were found to change very little as the result of the three month treatment program.

Evaluation of Treatment by Subjects

This instrument was administered to gain information about how the clients viewed the program and if they felt they were continuing to use techniques (self-monitoring, stimulus control, and contingent reinforcement), that had been taught in the program. The clients responded that they adhered to these techniques "about half of the

time," and "most all the time." In both cases, self-monitoring of foods eaten and their caloric values were reported as the most useful aspect of the program and the major change in their eating behavior. Mr. J. B. stated all aspects were helpful. He further felt that no change in exercise habits had occurred. The distance and expense of travel was reported by Mr. H. C. as the least liked aspect and that exercise habits had changed in that he "tried for more exercise."

Follow-up data confirmed the clients' subjective feelings. One client had maintained weight loss while the other client had lost an additional ten pounds. The maintenance of weight loss and continued weight loss may imply some long-term success. One client came to within 14.7 percent of his ideal weight. This put him into the overweight other than the obese category. His total weight loss represented a loss of one-half, or thirty-three, of the sixty-four pounds he was overweight. The other client had gained one pound during follow-up and was still 33.1 percent or fifty-six pounds over his ideal weight. This researcher strongly agrees with Wollersheim's results concerning further treatment. Therapists who participated in her study reported 83 percent of the treated subjects could profit from further treatment for weight reduction (Wollersheim, 1968). However, it is hoped the successful result of treatment may serve to motivate the client to continue weight loss first because significant changes occurred within the natural environment during the treatment program

and secondly a change in body form and size was significantly noticeable to envoke comments from family and friends that could reinforce the client to continue weight loss.

The present study supported observations made by Romanczky, et al. (1973) and others that a multifaceted approach is a useful mode of treatment in moderately obese patients.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study was concerned with the development of a teaching method and procedure to be used clinically by nurses or others in the treatment of obesity. A review of the literature revealed that while obesity is the result of multiple psychological and socio-cultural and physiological etiologies, the common characteristic that consistently distinguishes the obese from the non-obese is overeating. Further, Schachter (1971) has demonstrated that eating behaviors unique to the obese can be identified and are notably stimulus controlled. A comprehensive review of therapies for the treatment of obesity in the most recent five years support this observation; therapies based on stimulus control with contingency reinforcement have been consistently successful in effecting weight loss.

The primary objective of this study was to develop a multi-faceted behavioral program, utilizing guidelines suggested by Stuart (1972) and Wollersheim (1969). Unique to the present study was the replay via videotape of part of each session to enhance patient learning.

The clinical population chosen for the focus of the study was from a cardiovascular clinic. The need for the development of a weight reduction program was based on an increased incidence of individuals in the clinic population more than ten percent over their ideal weights. Overweight associated with cardiac disease greatly increased risk of mortality.

In developing the treatment program the following areas were included: a functional analysis of eating into its component parts of antecedents to eating, characteristics of the behavior itself, and consequences to eating; nutritional educational in general and in relation to cardiac disease; and exercise. The teaching sessions included reporting of data collected through the previous week, making observations from that data, and devising goals for the following week.

The treatment design consisted of three phases: baseline, treatment, and follow-up. The treatment phase included six weeks of continuous contact for weekly teaching-therapy sessions, followed by six weeks infrequent contact for review and monitoring. Weight assessment was done pre- and post-treatment and at the three month follow-up. An attitudinal scale was administered pre- and post-treatment. A subjective evaluation questionnaire was given at the end of follow-up.

Both clients lost more than twenty pounds. Average rate of weight loss was 1.7 to 2 pounds per week. At follow-up, one client

had regained one pound while the second client had continued to lose an additional ten pounds. There were few signs of reversal at follow-up. Problematic cues to eating, particularly the situationally controlled ingestion of large amounts of carbohydrate foods, were markedly decreased in both clients. One client reported feelings of hunger through much of the treatment period. This was thought to be from a too severe cutback in caloric intake. Self-monitoring procedures were effective for both clients and were maintained at follow-up. The effectiveness of the social reinforcement training of the client's spouse was judged particularly helpful in one client who showed continued weight loss after the end of treatment. Videotape replay was effective in building record keeping behavior and teaching self-observation of interactional styles, producing cooperative problem solving in relation to goals, and evaluation.

Conclusions

The purpose of the present study has been described in terms of Abdellah's third aim in nursing research; to develop tools and methods for clinical practice and further research (Abdellah and Levine, 1965). A teaching procedure was developed utilizing learning principles and incorporating video replay. The method was found to effect weight loss of an optimum rate during the clinical trial on the two case studies presented. In part, the method is a replication of work reported by

Stuart and Davis (1972) and Wollersheim (1969); however, the application of videotape replay and specific lesson plans and goals for each teaching session were unique to the present program and apparently made a typical behavioral program stronger.

One of the questions left unanswered in this and many other behavioral studies is whether or not the behavior change is lasting. Reference has been made to what Ferster (1962) has called the central issue of weight reduction programs, the adoption into the client's own repertoire, control, that is continuously available and used, to maintain a reduced and stable weight. Further, Watson and Harp (1972) suggest that one of the most common reasons for failure in modification of behavior is the lack of adequate "shaping." Long-term follow-up of the two case studies presented and the development of procedures aimed specifically at the variables that arise during the years following treatment programs is desirable.

The methodology developed was beneficial in that the systematic progression of the analysis and control of eating behavior allowed for maximum use of the therapy time. It was apparent from attendance and participation that interest and cooperation were maintained. Initial therapy-treatment time was considerable for both client and therapist; however, once the teaching sessions were completed, only a minimal amount of time was required for monitoring maintenance.

The participation of the client's wife added in every way, both during the treatment phase and later in the transfer of learning into the natural environment.

No conclusion can be reached about change in self and other attitudes. The Berger Self and Others Scale appears to be an appropriate instrument, however, for further investigation into this variable. Patients and wives scores were similar to those reported by Berger (1952) for similar age groups. Stuart (1972) described the model of behavioral intervention as: antecedent situation → eating → consequence situation → feelings about self. The nature of the changes in the feelings towards oneself would be an important question to further explore and measure and may be useful in predicting the need for further treatment.

Neither subject was involved in a regular exercise program at the end of treatment or follow-up. The instigation of routine exercise was clearly the weakest component of the present program. A programmed and contingently reinforced program of exercise, after the baseline evaluation is made, is of primary importance in the further use of the present program.

Recommendations

The following recommendations are suggested by this investigator.

1. The present treatment program be further developed in relation to the exercise component.

2. A high priority should be placed on the instigation of the present program or a similar behavioral program for the cardiac and other high risk populations at the hospital where the study was conducted. No regularly scheduled program now exists to this investigator's knowledge. Further, the techniques involved in teaching self-control and contingency management need to be shared with other disciplines, such as dietitians, who often have a primary role in treating overweight patients.

3. Long-term follow-up of behaviorally oriented programs would be the most meaningful addition to the present body of knowledge using this mode of treatment.

4. The use of a well-devised tool to measure specific eating behavior change would greatly facilitate the evaluation of the effects of a behavioral program.

5. The effect of the videotape tool needs further investigation to determine the variables that either add or detract from treatment. This could best be done in well controlled clinical studies.

6. The program also needs to be tested in a group versus individual situation.

In conclusion, beyond its specific contribution to this researcher's knowledge and skill concerning appropriate nursing

intervention in the treatment of obesity, this methodological study represents an attempt to contribute to a more sophisticated nursing approach to patient teaching. The treatment model could also be explored in other complex chronic problematic behaviors that directly or indirectly contribute to the optimum well-being of patients.

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APPENDICES

APPENDIX A

CORRESPONDENCE

8205 S. W. Brookridge Street
Portland, Oregon 97225
November 13, 1972

J. David Bristow, M. D.
Project Program Director
University of Oregon Medical School
Hospital
3181 S. W. Sam Jackson Park Road
Portland, Oregon 97201

Dear Dr. Bristow:

In partial fulfillment of the requirements for a Master degree in Nursing at the University of Oregon School of Nursing, I am undertaking a study to determine the effects of the incorporation of videotape feedback with the application of behavior modification principles to the treatment of obesity.

I would appreciate your interest and approval in using as participants in this study individuals now being treated through the cardiovascular clinic. There is also a need to collaborate with you on specific points of treatment, i. e. diet and exercise. Would you grant me a personal interview of approximately one hour to discuss the participants with you.

The hospital and the participants will not be identified; without written permission.

A self-addressed envelope is enclosed for your response indicating your approval of the use of your cardio-vascular patients in this study and a time for the interview.

Upon completion, a copy of this study will be placed in the library at the University of Oregon Medical School.

Yours truly,

Elizabeth S. Duncan
292-4521

Enclosures (2)

3181 S.W. Sam Jackson Park Road Portland, Oregon 97201

Area Code 503 225-8311

University of Oregon Medical School

DEPARTMENT OF MEDICINE

Dear

It has come to my attention through the cardiovascular evaluation clinic that your medical condition has necessitated a major change in eating and exercise habits. It has been my experience as a nurse that this directive is often difficult for patients to carry out. During this past year I have become increasingly interested in this problem and have devised a program using learning principles and closed circuit television that persons with a problem similar to yours have found very useful.

I am now in the situation of making this information available to a select group of patients. Part of the project will be to describe and document the effectiveness of this program in a research project. Your name and all other information will be handled confidentially and will be used only for scientific publication or professional teaching programs.

The program is designed to teach you to know how to lose weight and to keep it off. However, it is not just another "diet". Rather the emphasis will be the introduction of specific techniques that will help to retrain your eating and exercise habits. Although you will probably recognize these techniques as a systemized common sense approach, this program results from years of research in the problems of overeating. You may be saying, "But I know what I need to do already," or "I have tried and I just can't". The main thrust of this program is to help you develop the motivation necessary to maintain life-long good eating and exercise habits.

I will be consulting with the physician caring for you as to the specific dietary and exercise regimen best for you and I will report your progress to him.

To qualify for this program you only need to have the available time and have a member of your immediate family who is willing to go through the program with you. I will be making a phone call to you during the week of April 9-13, to set up a meeting to discuss this with you further if you are interested.

Yours truly,

Betty Duncan, RN.

Betty Duncan, R. N.
Graduate Student in Nursing

I have endorsed this study and encourage your participation in it.

J. D. Bristow M.D.

J. David Bristow, M. D.
Project Program Director
Cardiac Evaluation Clinic

May 22, 1973

Joseph Bilboa, M. D.
5055 North Greeley
Portland, Oregon 97217

Dear Doctor Bilboa:

A patient of yours, Mr. J. D. _____ was referred to me by the cardiovascular evaluation clinic at the University of Oregon Medical School as a prospective participant for a study I am doing in regard to weight reduction and control. I have seen Mr. and Mrs. _____ for three times and find that during the week of 5-9-73 to 5-15-73 he consumed an average of 1048 calories per day and used up with activity approximately 4937 calories per day. During that same period he lost five pounds. According to my calculations, at that level of activity, he ought to lose two pounds per week on a 1400 calorie diet.

The purpose of this letter is to inform you of the objectives and content of this study (see the enclosed abstract), to request your cooperation by assenting to Mr. _____ participation as appropriate medical treatment, and to request specific instructions as to level of caloric intake, dietary restrictions, and exercise level that you would like to see Mr. _____ maintain.

At the completion of these teaching sessions, I would be happy to send to you a summary of Mr. _____ progress.

Yours truly,

Elizabeth S. Duncan, R. N.
Graduate Student
University of Oregon School
of Nursing

jfb

May 22, 1973

Lowell Johnson, M. D.
Group Health Cooperative of Puget
Sound (Olympia Branch)
200 Fifteenth Avenue East
Seattle, Washington

Dear Doctor Johnson:

A patient of yours, Mr. Harold _____ was referred to me by the cardiovascular clinic at the University of Oregon Medical School as a prospective participant for a study I am doing in regard to weight reduction and control. I have seen Mr. and Mrs. _____ on five different occasions and have ascertained that at his present level of activity, Mr. _____ should continue to lose 2 - 3 pounds per week on a 1000 calorie diet.

The purpose of this letter is to inform you of the objectives and content of this study (see the enclosed abstract), to request your cooperation by assenting to Mr. _____ participation, and to request specific instructions as to level of caloric intake, dietary restrictions, and exercise level that you would like to see Mr. _____ maintain.

At the completion of these teaching sessions, I would be happy to send you a summary of Mr. _____ progress.

Yours truly,

Elizabeth S. Duncan, R. N.
Graduate Student
University of Oregon School
of Nursing

jfb

GROUP HEALTH MEDICAL CENTER
OLYMPIA MEDICAL STAFF
700 NORTH LILLY ROAD, 456-1700
OLYMPIA, WASHINGTON 98506

June 8, 1973

Elizabeth S. Duncan, R.N.
Graduate Student
University of Oregon School of Nursing
Department of Psychiatry
3181 S.W. Sam Jackson Park Road
Portland, Oregon 97201

Re: Study project involving Mr. Harold G.

Dear Ms. Duncan:

Thank you for your letters and abstract of your proposed study. I believe Mr. would be a good reliable candidate for your study. The 1000 calorie diet should be satisfactory. I think it would be useful to have a set of electrolytes and uric acid level along with his prothrombin time sometime at about three or four weeks into the study and again at two months into the study if he is maintained on the 1000 calorie diet. The sodium intake would necessarily have to be somewhat limited to approximately two grams daily. This should not be difficult at all on a 1000 calorie diet.

The exercise level that Mr. would be able to maintain would be very much dependent on his own personal abilities. As you know, he had a cerebral vascular complication resulting in a hemiparesis which modifies his walking ability. Walking, however, should be his most strenuous activity. He could maintain this within his own limits of toleration.

All this, of course, is dependent on Mr. agreeability to following in the study. I think it would be very much to his cardiovascular benefit. The laboratory work to which I referred could be done in our clinic at no charge to him. I suspect there would be a charge if it were done in your clinic. I'd be happy to see Mr. Carlson at any time during the study.

Thank you again for your letter, and I'll be looking forward to hearing from you again at the completion of your data collection and evaluation.

Yours sincerely,

Lowell E. Johnson, M.D.
Internal Medicine

P.S. The laboratory work was done. The results are pending.

LEJ/bon
cc: Harold G.

Psychiatry Outpatient Department
University of Oregon Medical School
3181 S.W. Sam Jackson Park Road
Portland, Oregon 97201
November 13, 1972

Research Press Company
CFS P.O. Box 3177
Champaign, Illinois 61820

Dear Publisher:

In partial fulfillment of the requirements for a Master degree in Nursing at the University of Oregon School of Nursing, I am undertaking a study to determine the effects of the incorporation of videotape replay to the application of the specific plan of behavior treatment as outlined by Stuart and Harris in their book, Slim Chance in a Fat World.

This letter is a request for permission to reproduce from the before mentioned book, forms, graphs, and charts needed to collect the baseline data for this therapy.

Yours truly,

Elizabeth S. Duncan

Research Press Company

2612 NORTH MATTIS AVENUE · CHAMPAIGN, ILLINOIS 61820 · (217) 352-3273

November 21, 1972

Ms. Elizabeth S. Duncan
Psychiatry Outpatient Department
University of Oregon Medical School
3181 S.W. Sam Jackson Park Rd.
Portland, OR 97201

Dear Ms. Duncan:

Research Press is pleased to give you permission to use graphs and charts from Stuart and Davis' *Slim Chance in a Fat World.*

Sincerely,

RESEARCH PRESS COMPANY

[redacted]

Ann Wendel
Senior Editor

AW:stw

October 10, 1973

Cardio Vascular Evaluation Clinic
University of Oregon Medical School
3181 S.W. Sam Jackson Park Road
Portland, Oregon 97201

RE: Mr. J. D. _____

Thank you for the opportunity to work with Mr. J. D. _____ in an effort to reduce this client's excess weight and promote more positive eating and exercise habits. Mr. and Mrs. _____ attended six weekly two-hour sessions from 5-5-73 to 6-13-73 and two follow-up sessions during the initial treatment time of three months. The approach was four-pronged: 1) psychological, the situational management of eating through the application of behavior modification principles and the use of video tape replay; 2) nutritional, the teaching of acceptable food choices in relation to weight loss and cardiac disease; 3) exercise, the evaluation of Mr. _____ average exercise level; 4) the use of Mrs. _____ as a positive reinforcing influence to support and cooperate in Mr. _____ program.

He progressed well and lost from 243 pounds to 216 pounds. Three months following the end of the initial treatment period he was found to have maintained all but one pound of his weight loss.

Yours truly,

Mrs. Elizabeth Duncan, R. N.
Graduate Student in Nursing

jfb

cc: Dr. Bilboa

October 10, 1973

Cardio Vascular Evaluation Clinic
University of Oregon Medical School
3181 S. W. Sam Jackson Park Road
Portland, Oregon 97201

Regarding: Mr. H. _____

Thank you for the opportunity to work with Mr. H. _____ in an effort to reduce this clients excess weight and promote more positive eating and exercise habits. Mr. and Mrs. _____ attended six weekly two hour sessions from 4-24-73 to 5-29-73. A four pronged approach was applied: 1. a psychological approach, the situational management of eating through the application of behavior modification principles and the use of video tape replay; 2. nutritional approach, the teaching of acceptable food choices in relation to loss of weight and to cardiac disease; 3. an exercise approach, the evaluation of Mr. _____ average exercise level and an increase in time and amount; 4. the use of Mrs. _____ a positive reinforcing influence to support and cooperate in Mr. _____ program.

Mr. _____ progressed well, and as a result his weight went from 227 pounds on 4-24-73 to 209 on 5-29-73. He was followed by mail for an additional six weeks and reported on 7-3-73 a weight of 207 pounds.

Yours truly,

Mrs. Elizabeth Duncan, R. N.
Graduate Student in Nursing

cc: Dr. L. Johnson

APPENDIX B

Consent to Participate Forms

and

History Form

PERMIT FORM FOR THE STUDY OF VIDEOTAPE FEEDBACK AS A TEACHING TOOL IN THE TREATMENT OF EXCESS WEIGHT

I agree to participate in this study to develop and research a method to reduce and control excess body weight. I understand that the loss of excess body weight will be beneficial to my health.

I have been informed as to the nature of the tasks expected of me during this investigation. These include: 1) relating my eating and exercise habits by means of written data and personal interviews which will be videotaped; 2) attending teaching sessions once a week for one and one-half to two hours for a series of six sessions, and then as it is judged necessary by me or the researcher, for a total treatment period of three months. Should I desire to continue some treatment after the before-mentioned period this could be arranged with the investigator; and 3) to procure, and assent to a member of my immediate family to attend each session with me. I further consent to and authorize the production of videotape recordings of each therapy session. I understand closed circuit television to be an essential part of this teaching therapy. Information that I divulge will be handled confidentially and will be used only for scientific publication or professional teaching programs. Thereby, my identity will not be revealed.

The purpose of this study is to apply certain learning principles clinically to a group of individuals who would benefit particularly from the reduction of excess weight. It is hoped that knowledge acquired from this investigation will be useful in the treatment of other individuals with similar problems.

I understand that I may withdraw my consent and discontinue participation in this study at any time without fear of impairment of the medical care I receive.

Mrs. Duncan has offered to answer any question I might have about the procedure I am submitting to.

Signed _____

Date _____

Place _____

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

AUDIO-VISUAL AUTHORIZATION PERMIT

Date Bldg. Fl. Rm.

Unit No.
Name
Birthdate
Project No.

In the interests of science and the furtherance of medicine, and for other valuable considerations, I_____ , Unit No._____ consent to and authorize the taking of photographs and motion pictures and the production of closed circuit television programs, video tape recordings and other visual and auditory recordings of me by the University of Oregon Medical School Hospitals and Clinics and their employes and agents. I authorize such materials to be used, without restriction as to time, in medical teaching programs, scientific and medical publications, and non-commercial media. I further authorize the use of my name in connection with these materials. I release the University of Oregon Medical School Hospitals and Clinics and their employes and agents from any responsibility in this matter and understand that no payment is to be made to me on account of my participation in the activities hereby permitted.

Signature_____

In consideration of the above-referenced materials being used for medical and scientific purposes and for other valuable considerations I hereby consent to the foregoing release by

_____.

_____
Signature of Parent or Guardian

_____
Witness

_____
Date

_____
Doctor

6.0A

6.0A-3/71

IDENTIFYING DATA AND HISTORY FORM

Name _____ Unit No. _____ Date _____

Age _____ Race _____ Marital Status: S M W D Sex: M F

Residence (city, state) _____ Tel: _____

Occupation _____ Referral Source _____

Weight ____ Height ____ Ideal Weight ___ % Overweight ___ Goal ____

How does it happen that the patient is seeking help with the weight problem at this time? _____

Is the objective a short term or long term objective? _____

Patient's own words: "_____"

When did the patient first become overweight? _____

Has the patient ever been at an ideal weight since that time _____

How has the patient tried to lose weight before? _____

What has worked for the patient before? _____

What would have to change in the patient's life to be able to lose weight now? _____

What in the patient's life would make it difficult to stay with a weight reduction program? _____

Emotionally? _____

Socio-economically? _____

Environmentally? _____

Medically? _____

Is the patient on any medication? _____

Name of medication _____ Reason _____

_____ _____

_____ _____

Who in the patient's family would help him lose weight? _____

APPENDIX C

Assessment Instruments

EVALUATION FORM

If you are willing, would you make a frank statement about the most useful aspect of the program for weight loss in which you participated:

the least helpful aspect:

What is the major difference in your eating habits now?

What is the major difference in your exercise habits now?

Have you been able to continue using the program on your own?
Respond by marking the one phase that describes best your answer:

1. None of the time _____
2. Less than half the time _____
3. Half the time _____
4. Most of the time _____
5. All the time _____

Thank you,

Betty Duncan, R. N.

APPENDIX D

Data Collection Forms

DAILY MONITORING FORM

Name _____

Date _____

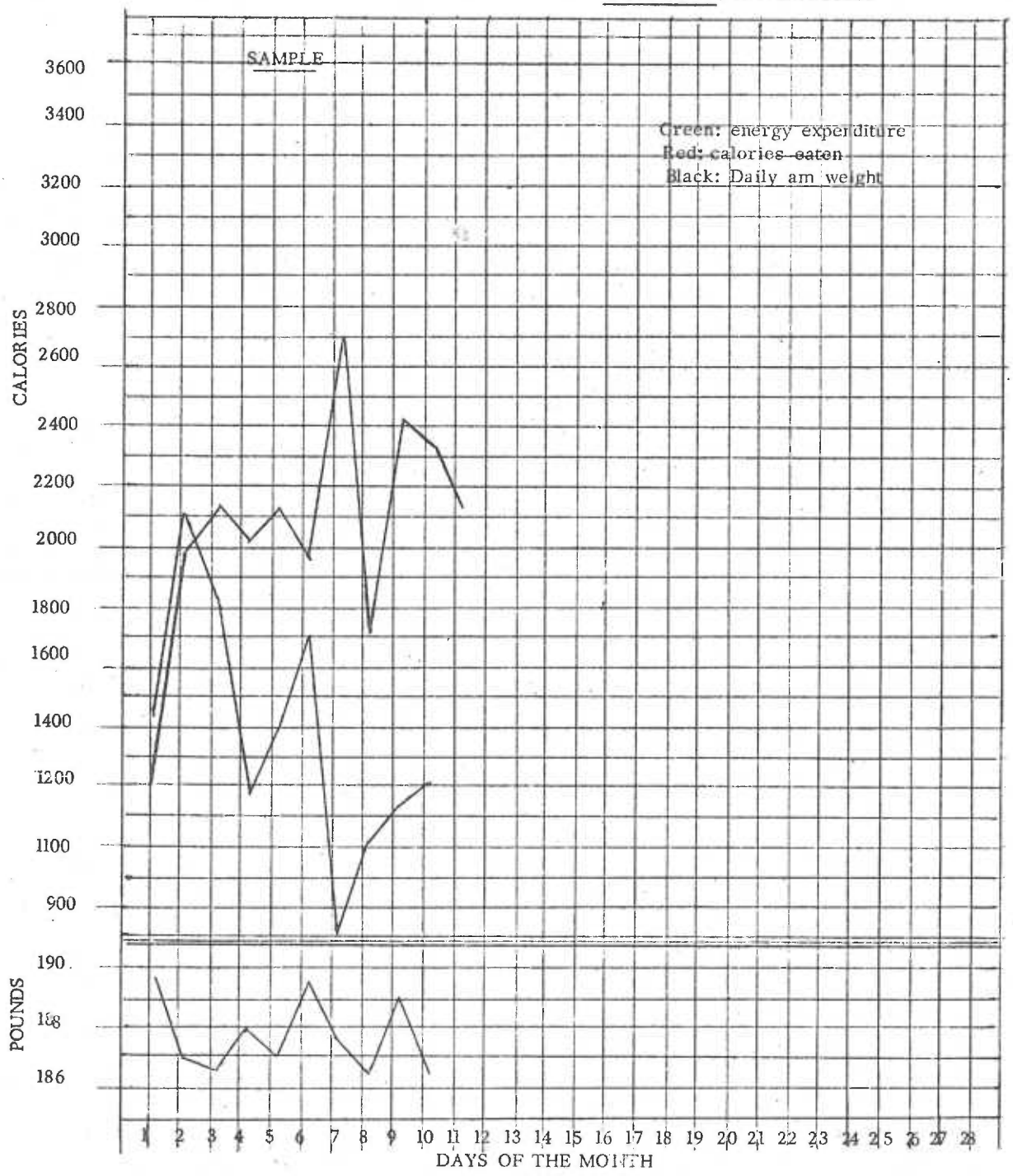
Weights: 8 a. m. ____
12 noon ____
4 p. m. ____
8 p. m. ____

Time	Food eaten	Am't	Calories	The occasion, ie, breakfast, break, etc.	What happened after eating	Any particular emotional feeling	Exercises Activity	Minutes
12 am								
1 am								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
1 pm								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

Total: Material adapted from Harari, Group Therapy vs Bibliotherapy, Un. Ill 1970 Total:

DAILY EATING, EXERCISE, AND WEIGHT GRAPH

R.B.Stuart, B.Davis, Slim Chance in a Fat World, Research Press



1350–CALORIE FOOD PLAN

EXCHANGES	6 MEAT	5 CEREAL	2 MILK	3 VEG	4 FRUIT	4 MISC
MORNING						
AFTERNOON						
EVENING						
OTHER FOODS						

FOOD PLAN TOTAL	EXTRAS	TOTAL CALORIES

EXERCISE PLAN*

LIGHT EXERCISE		Each box = 5 min. = 20 calories x20=
MODERATE EXERCISE		Each box = 5 min. = 35 calories x35=
HEAVY EXERCISE		Each box = 5 min. = 50 calories x50=

DAILY TOTAL

*Caloric values are for gross energy expenditure.

FORM FOR RECORDING THE TIMES YOU RESIST EATING

Time	Food Desired	Calories	What happened before the temptation to eat	What you did instead of eating	What happened after you resisted the temptation to eat	Any emotional feelings you experienced before and after the experience

Form adapted from Hagen, R. L., Group Therapy vs. Bibliotherapy in Wt. Reduction, Un. Ill., 1970.

BERGER ATTITUDE INVENTORY

This is a study of some of your attitudes. Of course, there is no right answer for any statement. The best answer is what you feel is true of yourself.

You are to respond to each question in the answer column according to the following scheme:

Not at all true of myself	Slightly true of myself	About halfway true of myself	Mostly true of myself	True of myself

Remember, the best answer is the one which applies to you.

		Not true of myself	Slightly true of myself	About halfway true of myself	Mostly true of myself	True of myself
1.	I'd like it if I could find someone who would tell me how to solve my personal problems.					
2.	I don't question my worth as a person, even if I think others do.					
3.	I can be comfortable with all varieties of people--from the highest to the lowest.					
4.	I can become so absorbed in the work I'm doing that it doesn't bother me not to have any intimate friends.					
5.	I don't approve of spending time and energy in doing things for other people. I believe in looking to my family and myself more and letting others shift for themselves.					
6.	When people say nice things about me, I find it difficult to believe they really mean it. I think maybe they're kidding me or just aren't being sincere.					
7.	If there is any criticism or anyone says anything about me, I just can't take it.					
8.	I don't say much at social affairs because I'm afraid that people will criticize me or laugh if I say the wrong thing.					
9.	I realize that I'm not living very effectively but I just don't believe that I've got it in me to use my energies in better w ays.					
10.	I don't approve of doing favors for people. If you're too agreeable they'll take advantage of you.					
11.	I look on most of the feelings and impulses I have toward people as being quite natural and acceptable.					
12.	Something inside me just won't let me be satisfied with any job I've done--if it turns out well, I get a very smug feeling that this is beneath me, I shouldn't be satisfied with this, this isn't a fair test.					
13.	I feel different from other people. I'd like to have the feeling of security that comes from knowing I'm not too different from others.					
14.	I'm afraid for people that I like to find out what I'm really like for fear they'd be disappointed in me.					

	Not true of myself	Slightly true of myself	About halfway true of myself	Mostly true of myself	True of myself
15. I am frequently bothered by feelings of inferiority.					
16. Because of other people, I haven't been able to achieve as much as I would have.					
17. I am quite shy and self-conscious in social situations.					
18. In order to get along and be liked, I tend to be what people expect me to be rather than anything else.					
19. I usually ignore the feelings of others when I'm accomplishing some important end.					
20. I seem to have a real inner strength in handling things. I'm on a pretty solid foundation and it makes me pretty sure of myself.					
21. There's no sense in compromising. When people have values I don't like, I just don't care to have much to do with them.					
22. The person you marry may not be perfect, but I believe in trying to get him (or her) to change along desirable lines.					
23. I see no objection to stepping on other people's toes a little if it'll help get me what I want in life.					
24. I feel self-conscious when I'm with people who have a superior position to mine in business or at school.					
25. I try to get people to do what I want them to do, in one way or another.					
26. I often tell people what they should do when they're having trouble in making a decision.					
27. I enjoy myself most when I'm alone, away from other people.					
28. I think I'm neurotic or something.					
29. I feel neither above nor below the people I meet.					
30. Sometimes people misunderstand me when I try to keep them from making mistakes that could have an important effect on their lives.					
31. Very often I don't try to be friendly with people because I think they won't like me.					
32. There are very few times when I compliment people for their talents or jobs they've done.					
33. I enjoy doing little favors for people even if I don't know them well.					
34. I feel that I'm a person of worth, on an equal plane with others.					

	Not true of myself	Slightly true of myself	About halfway true of myself	Mostly true of myself	True of myself
35. I can't avoid feeling guilty about the way I feel toward certain people in my life.					
36. I prefer to be alone rather than have close friendships with any of the people around me.					
37. I'm not afraid of meeting new people. I feel that I'm a worthwhile person and there's no reason why they should dislike me.					
38. I sort of only half-believe in myself.					
39. I seldom worry about other people. I'm really pretty self-centered.					
40. I'm very sensitive. People say things and I have a tendency to think they're criticizing me or insulting me in some way and later when I think of it, they may not have meant anything like that at all.					
41. I think I have certain abilities and other people say so too, but I wonder if I'm not giving them an importance way beyond what they deserve.					
42. I feel confident that I can do something about the problems that may arise in the future.					
43. I believe that people should get credit for their accomplishments, but I very seldom come across work that deserves praise.					
44. When someone asks for advice about some personal problem, I'm most likely to say, "It's up to you to decide," rather than tell him what he should do.					
45. I guess I put on a show to impress people. I know I'm not the person I pretend to be.					
46. I feel that for the most part one has to fight his way through life. That means that people who stand in the way will be hurt.					
47. I can't help feeling superior (or inferior) to most of the people I know.					
48. I do not worry or condemn myself if other people pass judgment against me.					
49. I don't hesitate to urge people to live by the same high set of values which I have for myself.					
50. I can be friendly with people who do things which I consider wrong.					
51. I don't feel very normal, but I want to feel normal.					
52. When I'm in a group I usually don't say much for fear of saying the wrong thing.					
53. I have a tendency to sidestep my problems.					

	Not true of myself	Slightly true of myself	About halfway true of myself	Mostly true of myself	True of myself
54. If people are weak and inefficient I'm inclined to take advantage of them. I believe you must be strong to achieve your goals.					
55. I'm easily irritated by people who argue with me.					
56. When I'm dealing with younger persons, I expect them to do what I tell them.					
57. I don't see much point to doing things for others unless they can do you some good later on.					
58. Even when people do think well of me, I feel sort of guilty because I know I must be fooling them--that if I were really to be myself they wouldn't think well of me.					
59. I feel that I'm on the same level as other people and that helps to establish good relations with them.					
60. If someone I know is having difficulty in working things out for himself, I like to tell him what to do.					
61. I feel that people are apt to react differently to me than they would normally react to other people.					
62. I live too much by other people's standards.					
63. When I have to address a group, I get self-conscious and have difficulty saying things well.					
64. If I didn't always have such hard luck, I'd accomplish much more than I have.					

BASELINE DATA MONITORING FORM

Date: _____ Name: _____

Weights: before breakfast_____
before lunch _____
before dinner _____
at bedtime _____

Comments about the day in general: _____

A Time	B Food, Drink & Am't	C Calories	D E Where Posture	F Comments Mood (letter)	G Alone or with whom	H (no.) Activity	I Min
12 am							
1 am							
2 am							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
1 pm							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11 pm							
	Total:					Total:	

GUIDE TO THE USE OF THE BASELINE MONITORING FORM

Column A. Circle the time when food was eaten.

Column B. The name of the food or drink taken, and the amount, i. e., 1/2 cup, 1 oz., etc.

Column C. The number of calories in that amount of food or drink. Total the number for each day.

Column D. Where the eating occurred, i. e., home, kitchen, etc.

Column E. Indicate whether it was eaten while standing, sitting, etc.

Column F. The feeling before the food was eaten; chart the letter that best describes the feeling state and add any explanative comments.

A. Anxious
B. Bored
C. Tired
D. Depressed
E. Angry
F. Neutral
G. Hungry (especially)

Column G. Were you alone or with someone and indicate who that someone was.

Column H. Below are listed five levels of activity. Indicate which level of activity was engaged in by number, or you may use a word to describe the activity.

1. This is essentially the basal rate of metabolism plus some allowance for turning over and getting up and down. It will also serve to indicate the number of hours of sleep or rest each day. This uses .4 calories per pound body weight per hour.

2. This is normal activity while sitting, reading, driving a car, and including normal outdoor activity such as standing and walking in limited areas and moving from one room to another. This uses .7 calories per pound body weight per hour.

3. In this category are such things as purposeful walking, largely outdoors, occupational activity involved in light physical work, normal housework, light gardening and carpentry, and activities sitting down that require vigorous are movements. This uses 1.4 calories per pound body weight per hour.

4. This includes heavy housework, heavy gardening, cycling 5-9.5 mi. per hour, dancing using a fast step, stationary cycling at a moderate rate, tennis, walking fast and golfing.
This uses 2.8 calories per pound body weight per hour.

5. This category includes vigorous exercise such as calisthenics, climbing up and down stairs, cycling (12 mi./hr.) handball, paddleball, skipping rope, jogging, swimming (40 yd./min.) skiing, running and playing football.
This uses 4 calories per pound body weight per hour.

Column I. Write the number of minutes or hours involved in each category. Total each day by multiplying calories expenditure in that category times your weight, times the number of hours during the day you were involved in that category of activity. Make a total for all the categories.*

*This is an average minimal estimate.

APPENDIX E

Work and Goal Sheets

WORK SHEET FOR SESSION I

(Compilation of comments made by Patient Family No.)

The intent of this lesson is to help you to become a keen observer of your own eating behavior and to learn to identify the signals and situations associated with your eating. While listening to the videotape, write down your observations about the following:

Number of times eating occurred each day.	Meals that were not eaten,	When the most food was eaten Situation	Time	Locations, postures.	Associated activities
Mon.					
Tues.					
Wed.					
Thurs.					
Fri.					
Sat.					
Sun.					

WORK SHEET SESSION I

What kinds of food were eaten?		How much food is being eaten?			
Recurrent themes	Snacks	What kind of preparation	Size of portions	Accomplishments	Other observations, including how the "social reinforcer" has been effective.

Goal Sheet, Session I

Date _____ Name _____

These suggestions will help to eliminate some of the environmental cues (signals or situations) that are associated with eating.

1. Arrange to eat in one room only.
   When I am at home I will eat _____
   At work I will eat _____
2. Arrange to eat in one place in that room. Set that place each time you eat anything with a placemat, plate, silver, goblet, and napkin. Sit down before you eat.
3. Schedule when you will eat and eat only at those times.

Time	Meal or snack	Place the meal or snack will be allowed
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

The following suggestions will help you gain control over cues that precede eating that cannot be entirely eliminated. Especially the sight and smell of food itself.

4. Buy non-fattening foods.
5. Shop from a grocery list and only after you have eaten a meal.
6. If you have to buy problem foods, keep them out of reach and out of sight. Some of the problem foods I can identify are

_____

7. Make sure foods you eat need preparation. It helps if they take a long time to eat.
8. Keep low calorie snacks ready in the refrigerator.
9. Become familiar with different kinds of soda pop, including the number of calories in each. Drink a low calorie soda pop before going to a dinner party or restaurant to "fool your stomach." Use water the same way.
10. Use a smaller place to make servings appear larger.

Further goals for this week are: _____

_____

My exercise goal for this week is _____

_____

Signed _____

As the "reinforcer," or "helper," I will _____

_____

_____

Signed _____

Continue to fill out data collection sheets, and bring them to the sessions.

WORK SHEET, SESSION II

Areas that give the greatest problems	Moods and feelings before eating	What happened to bring about that feeling?	Can that event be eliminated? How can its effect be decreased? Can something else be substituted when that happens?	Other observations

EXAMPLES OF BEING DEPRIVED

Date:

SKIPPED MEALS	FATIGUE	LACK OF ANY SPECIFIC THING TO DO

Goal Sheet: Session III

Date _____ Name _____

There are three states of feeling deprived that have been shown to be associated with problem eating.

1. Food deprivation: when a person skips a meal he puts himself in a state of being deprived that automatically increases the positive value of food. He may then reward himself at a later time by over-eating.

Plan when you will eat every meal.

2. Energy deprivation: fatigue and overeating are often associated.

Avoid fatigue due to lack of sufficient sleep.

Notice the deficit between food intake and energy expenditure. I eat an average of _____ calories, and use up an average of _____ calories a day in physical activity.

3. Stimulus deprivation is boredom. Eating is often associated with the lack of a specific interest at the time.

Keep available a number of nonfood activities capable of engaging your interest. They may be social avocational, work, or exercise.

Goals: _____

_____

Signed _____

Goal for the social reinforcer: _____

_____

Signed _____

WORK SHEET, SESSION IV

Date _____ Name _____

Events that set the stage for desirable eating practices	Events that follow desirable eating patterns	Controlled by	
		Self	Others (Who?)

Goal Sheet: Session IV

Date _____ Name _____

The first part of this lesson deals with the behavior itself: EATING. In the model we have been using it can also be referred to as the response.

Antecedents	Response	Consequences
(Situations that signal a desire to eat)	(Intake of food)	(Wt. gain or wt. loss, positive comments about behavior (or negative). increased sense of self control, monetary reward.)

These steps will help you slow down your eating:

1. Take small mouthfuls of food and chew the food completely, tasting it thoroughly before swallowing.
2. While you are chewing, lay down the eating utensil for a few seconds, and increase the interruption to 2-3 minutes. Congratulate yourself on your sense of self-control.
3. Initiate conversation between each 2-3 mouthfuls of food; or if you are alone, time yourself to make the meal last a designated number of minutes.
4. Leave a portion of each food on your plate.
5. When you finish the meal, go brush your teeth.

I have identified that _____ signal positive eating practices and appreciate my social reinforcer for _____.

You can further increase immediate feedback about your program by keeping a daily eating, exercise and daily weight graph. A sample of such a graph will be given to you. Post it on your refrigerator so others can see it and pat you on the back too. This graph will help you in three ways:

1. Help you keep track of how well you are following the program.
2. Help you find out how well the program is working for you and if any changes need to be made.
3. Serve as a constant "pat on the back."

Expect to keep such a graph always.

My exercise level is _____

Signed _____

I will monitor the posting of information on the daily graph.

Signed _____

SESSION V

(This session was on nutrition. No work sheet or goal sheet was used during the session due to lack of sufficient time. A sample that could be used is included.)

WORK SHEET, SESSION V (to be used as thought necessary)

SESSION V

AID IN DETERMINING OPTIMUM CALORIC INTAKE IN ORDER TO LOSE APPROXIMATELY 2 POUNDS/WEEK

1. Total number of calories taken in through food in one week _____. caloric average _____ /day

2. Total number of calories expended through activity + basal metabolism (some calories are used in the metabolism of foods also) _____ caloric average _____/day

3. Number of pounds gained or lost _____

4. This represents _____ calories (3, 500 per pound).

5. If you have lost, add 3, 500 x number pounds lost to average caloric intake per day. If you have gained, subtract 3, 500 x number pounds gained to average caloric intake per day.

6. This is the average caloric maintenance value to maintain your present weight at the present level of activity.
caloric average _____/day

7. What is the difference between the caloric intake and energy expenditure? _____

8. How many pounds lost does it represent? _____

9. Now, if you want to lose two pounds per week, you need to subtract 500 calories each day from the average caloric maintenance value calculated in Step Six.

Goal Sheet, Session V

Date _____

From the discussion on diet I learned _____

_____

_____

1. The amount of food I eat is (portions): _____
2. The number of calories I eat is: _____
3. The amount and kind of fat I am eating is: _____
4. The amount of sugar I am eating is: _____
5. My physician's restrictions on fat and sugar are: _____

   _____
6. I am eating too many empty calorie foods ___yes _____no
7. I am eating too many highly processed foods _____yes _____no
8. The amount of fruits and vegetables needs to be: _____
9. I am eating a well-balanced diet _____yes _____no. This I know because I eat _____meat exchanges, _____cereal exchanges, _____milk exchanges, _____vegetable exchanges, _____fruit exchanges, _____ misc. exchanges.
10. Am I drinking an adequate amount of water in my diet? _____
11. Do I include alcohol in my diet? _____
12. My serum lipid level is: _____
13. My level of exercise is: _____

Signed _____

I learned _____

Signed _____

Goal Sheet, Session VI

Name _____ EXERCISE Date _____

Exercise, or physical activity, is stressed for several reasons:

1. It will use up calories.
2. An optimum amount of physical activity has a dampering effect on the appetite regulatory center in the brain.
3. Exercise has a direct effect of increasing muscular tone and improving circulation.

How many calories do you burn up in light exercise, on an average, each day? This category includes such things as purposeful walking, largely outdoors, occupational activity involved in light physical work, normal housework, light gardening and carpentry, and activities sitting down that require vigorous arm movements.

_____ av./day

Goal: _____ av./day

How many calories do you burn up in moderate exercise, on the average each day? Includes heavy housework, heavy gardening, cycling 5-9 mi/hr, dancing a fast step, stationary cycling at a moderate rate, tennis, walking fast.

_____ av./day

Goal: _____ av. /day

How many calories do you burn up in heavy exercise, on an average each day? This category includes calisthenics, climbing up and down stairs, cycling 12 mi/hr, handball, paddleball, skipping rope, jogging, swimming 40 yds/min, skiing, and running.

_____ av./day

Goal: _____ av./day

Suggestions to help you maintain your daily exercise pattern:

1. Find a partner (name of partner). _____

2. Start now so your exercise habit will be well developed before you retire, weather changes, etc.

3. Who is going to help you maintain this very important activity? (name and how) _____

_____

THE EXERCISE PROGRAM:

_____

_____

Signed _____

INSTRUCTION SHEET, SESSION VI

Date _____

The really rewarding consequence of your development of new eating and exercise habits is probably the loss of weight. In this program the small consistant loss of weight is emphasized. The loss of weight then is a slow accomplishment. Your new behaviors will not last unless you reward yourself in a meaningful way for your development of self-control. For this reason you and the person helping you are asked to devise a system of reinforcement.

My system of reinforcement is as follows:

Response	Amount	Reward

My exercise level is at _____

Signed _____

I will be the administration of the system of rewards.

Signed _____

APPENDIX E

Raw Scores for the Berger Acceptance of Self and Others Scale

Pat. II				Pat. I				Wife Pat. II				Wife Pat. I				No.
Pre		Post		Pre		Post		Pre		Post		Pre		Post		
S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	
3		4		1		1		5		5		1		1		1
3		1		2		4		3		3		2		2		2
	1		5		2		3		4		5		4		4	3
	1		1		4		5		5		5		5		5	4
	3		5		3		5		5		4		5		5	5
4		4		5		5		3		2		2		2		6
3		3		5		5		3		2		5		5		7
5		5		5		5		1		1		5		5		8
4		5		4		5		5		5		4		3		9
	5		5		5		5		5		0		5		5	10
5		4		1		5		1		1		4		5		11
5		5		5		5		1		5		5		5		12
5		5		5		1		4		3		3		2		13
5		5		5		5		4		5		4		5		14
5		4		5		5		4		3		1		1		15
5		4		5		5		5		2		4		5		16
5		0		4		4		5		2		3		5		17
3		5		5		5		2		3		5		4		18
	4		3		5		5		5		5		5		5	19
2		5		3		2		3		2		1		1		20
	3		3		5		1		5		5		3		5	21
	0		4		5		5		3		4		4		5	22
	4		3		5		5		5		5		5		5	23
4		5		5		5		5		4		5		5		24
	4		3		5		5		5		5		5		5	25
	3		5		5		5		4		4		4		5	26
	5		5		5		5		5		1		4		2	27
4		2		5		5		5		5		1		1		28
	1		1		5		5		5		5		4		5	29
	3		1		5		1		1		2		5		5	30
5		5		5		5		5		4		4		5		31
	4		5		1		1		5		5		5		5	32
	3		2		3		4		2		4		5		1	33
4		1		5		5		3		2		3		3		34
5		5		5		5		5		3		2		1		35
	5		5		5		5		4		2		1		2	36
4		4		5		5		5		2		3		3		37
3		5		5		5		3		4		3		1		38
	2		3		1		1		1		1		1		1	39
3		4		3		1		5		5		3		4		40
4		5		5		5		5		5		5		5		41
4		0		3		5		2		2		3		3		42
	5		4		5		5		5		5		5		5	43
2		2		3		5		2		3		4		5		44
4		0		5		5		5		1		3		5		45
	4		5		5		5		5		5		5		5	46
	4		5		5		5		5		4		5		5	47
4		4		5		1		1		1		4		3		48
	4		2		5		5		5		5		5		5	49

Pat. II				Pat. I				Wife Pat. II				Wife Pat. I				No.
Pre		Post		Pre		Post		Pre		Post		Pre		Post		
S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	
	2		2		1		5		1		2		1		1	50
5		5		5		5		5		4		5		3		51
5		4		4		5		4		2		4		5		52
4		5		5		5		4		4		1		4		53
	5		5		5		5		5		5		5		5	54
	4		4		5		5		4		4		4		5	55
	2		4		5		5		2		3		5		5	56
	5		5		5		5		5		5		5		5	57
5		5		5		5		2		4		5		5		58
4		5		1		1		2		3		3		4		59
	2		3		3		5		5		5		3		5	60
5		5		5		5		5		5		5		2		61
4		4		5		5		5		1		4		3		62
4		3		1		3		1		1		2		5		63
5		5		3		5		4		4		5		5		64
151	90	144	99	150	113	153	120	130	113	110	108	122	117	126	121	

AN ABSTRACT OF THE FIELD STUDY OF

ELIZABETH S. DUNCAN

For the MASTER OF NURSING

Date receiving this degree: June 7, 1974

Title: WEIGHT REDUCTION IN TWO CARDIAC PATIENTS: A CLINICAL APPLICATION OF VIDEOTAPE REPLAY AND BEHAVIOR MODIFICATION

Approved: May Rawlinson

The purpose of this study was to develop a multifaceted behavioral program to be used by nurses and others in the treatment of obesity. Videotape replay of part of each session was unique to the present study.

The final goal of all learning theory approaches to weight reduction is the attainment of control on the part of the subject so that his eating behavior can be self-monitored, and thus self-controlled. Stuart and Davis (1972) have suggested a variety of mechanisms designed to limit the external stimuli which control the eating response. These procedures were designed to make each response discrete and consequently more amenable to control. Utilizing these guidelines, the component of increased family involvement was added. To conserve and maintain eating behavior

change in the natural environment, the wife of the subject was instructed in useful ways to become a powerful social reinforcer. Videotape replay was used to focus on this aspect and throughout the program to increase patient-family involvement.

A three month treatment period was divided into two phases. An initial six weeks of continuous contact for the teaching-therapy sessions was followed by six weeks of intermittent contact for monitoring the subjects progress. Follow-up was conducted three months following the end of the treatment period.

Literature concerning modes of therapy for obesity suggests that weight reduction is a difficult task. Criteria for measurement of successful weight loss suggests that the loss of more than twenty pounds of body weight is rare, and maintenance of such a loss has an even lower success rate (Stunkard 1959). The subjects in the two case studies presented both lost twenty pounds or more. One subject had lost an additional ten pounds at follow-up, while the other subject reported a one pound weight gain. A comparison of Stunkards' findings with that of the present study suggests this program was as successful, and possibly superior to existing programs for the control of obesity. Further, the amount of weight loss exhibited by the subjects indicates the use of videotape replay is a useful adjunct in a broad behavioral program to accelerate, facilitate, and personalize learning.