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## Obesity as a defense

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OBESITY AS A DEFENSE

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Submitted in Partial Fulfillment for the Degree of  
Doctor of Medicine

College of Medicine, University of Nebraska

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Omaha, Nebraska

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TABLE OF CONTENTS

I. Literature review of obesity . . . . .	1
Environmental factors	1
Physiology	1
Physical activity	2
Personality	3
Self-concept	4
Relation with people	5
Intelligence quotient and insight	6
Hunger denial	6
Eating patterns	7
Treatment	7
II. Case histories . . . . .	8
III. Methods . . . . .	13
IV. Limitations of study . . . . .	18
V. Results . . . . .	18
VI. Discussion . . . . .	26
VII. Conclusions . . . . .	29
VIII. Bibliography	

Past history of obesity has revealed a shifting of emphasis of the study of the obese from such fields as genetics and endocrinology to one of increasing work with personality development and emotional factors of the obese. One would suspect that these factors are dominant in many obese.

There are many significant environmental factors influencing dietary habits, patterns and nutrition. These include 1) decline in chronic disease, 2) advanced technology of food production, 3) economics, 4) monotony of life, 5) attitude of the public, especially toward feeding solid food earlier, 6) attitude of the nutritionist and the pediatrician and 7) promotional advertising (7, 8).

Physiology: Obesity can be looked upon as the physiologic (according to Mayer) processes interacting among host, agent, and environment.(15)

HOST	AGENT
Genetic: dominant, recessive sex-linked, etc.	Surgical damage (hypothalamus, frontal lobe)
	Chemical damage (hypothalamus, gold thioglucose)
	Hormonal imbalance (experimentally induced or clinical hormone administration, non-secreting tumors)
	Psychic trauma (mediated through abnormal carbohydrate metabolites or purely at cortical level)
ENVIRONMENT	
Nature of diet (high fat)	
Exercise	
Temperature	
Conditioning (experimental animals)	
Socioeconomic and cultural factors	

However, in dealing with obesity as a defense there is one single mechanism for obesity. This is quite simply over-eating or hyperphagia. The underlying motivation for the overeating is still obscure. For practical interest a number of facts are apparent in the obese. They have a pattern of eating which is far more variable and less "freely disclosed than that of normal weight subjects." (1) The food intake of the obese is almost sure to be an underestimate of the caloric intake. (1) On practical interest again, Stunkard (26) has reported on the night eating syndrome, a syndrome characterized by 1) eating greater than one-fourth of the day's total calories during the period following the evening meal, 2) sleeplessness (trouble going to sleep), and 3) morning anorexia. This syndrome is associated with stressful periods of life and also weight gain. Stunkard (25) also points out that the obese use denial of hunger especially in periods of "emotional stress". Denial functions to exclude from conscious awareness "any stimuli that signal caloric deficit," because of a "conflict over eating" or "social pressures about eating."

Physical activity: The literature is flooded with studies of obesity and physical activity, eating and its relationship to physical activity. Mayer et. al. reported on exercise and food intake in rats and obese mice as well as in male industrial workers of Bengal (15, 16). There was determined in both humans

and mice to be a "sedentary range," a range of physical activity decreased from a previously determined normal, where there was an actual increase of food intake over those with the normal activity. At the point of physical exhaustion, on the other hand, there was found a decrease in food intake. Between these extremes there was a zone where food intake increased with physical activity.

Stefanik et. al. (24) reported that in spite of little difference of time allotted for energy activities, there was a significant lack of "degree of participation" in active exercises. Johnson et. al. (13) in studying school children found that the winter months were the months of greatest incidence of obesity, implicating lack of activity at this time. (or should one implicate failure of child emancipation by force of environment?) Johnson et. al. (13) in another study concluded that in obese females (high school girls) inactivity was more important than "overeating." Dorris and Stunkard (5) reported that obese women distorted their own activity and actually walked less than one-half of a control group.

Personality: One can say very simply that the obese have no definite personality type. It has been recognized by internists and psychiatrists alike that many patients have a psychiatric disturbance, however. Hilda Bruch has determined that this is "a disturbance (in the juvenile obese) in the maturation of

the total personality." It is a "somatic compensation for thwarted creative drives whereby total size becomes an expressive organ of conflict." (4) In their inability to fulfill a need they relieve their dissatisfaction by eating, thereby creating something special, something bigger and better: themselves. (2) Weinberg et. al. (27) support their own hypothesis that obese men are more anxious and more neurotically disturbed than non-obese men.

Despite the failure to find a definite personality disturbance, there are many generalizations about the obese reported in the literature. These include the self-concept, the obese' relations with the opposite sex, their relation to life's stresses, the weight changes in the obese, the I. Q., a condition of hunger denial, and the types of eating habits. These features are generally common to the obese in spite of the absence of a common personality disturbance.

Self-concept: In this category two definite trends are felt to exist. One exists in that group known as the juvenile obese (i. e. those individuals whose obesity was present prior to puberty as well as in adulthood). The other exists in that group known as the adult obese (i. e. those individuals whose obesity developed in adulthood, the dividing line being that hazy period of puberty and early adolescence.) One sees among the juvenile obese a "desperate fear of nothingness" or simply "derogatory



ideas of themselves." (2, 17) These individuals are usually the baby of the family. The adult on the other hand is far more imaginative and grandiose in his thinking. The adults have the greatest possible self-concept. Indeed, in their own audacity they describe themselves as more dominant, status-conscious, and more self-accepting (18). But alas, they reveal themselves in psychological testing as much weaker and more dependent at less than conscious levels.

In relations with the opposite sex or indeed relations with the same sex, part of this is portrayed as above. The adult usually say they get along well. Their social peers have different ideas, however. Most of the adult obese are married. However, in spite of the "better-half" influence there exists in impressive numbers a significant impairment of work and/or family adjustment. The juvenile obese category again have an even greater impairment of adjustment. Significant members of them are not married. (In one study eight of eleven.) (18) They are timid, retiring, clumsy, immature, overdependent, nonaggressive, babyish, passive, non-creative, restless, and innumerable other adjectives describing them well. Bruch (4) sums these descriptions up as "incorrect learning experience subjected upon them by parents with an anxious overconcern." Bruch (3) in a survey of one hundred obese patients revealed that twenty-three of them had acquired a "degree of independent self care in harmony with their ages." She also found that those

extremely dependent with no "household obligations" made little or no social contact. They expect everything to be done for them. They know not the pleasure or the sate of independence, of independent achievements. The key word to relations with people, opposite or same sex, peers or contemporaries is dependence.

Relation to life stress: Indeed this is extremely broad. Nothing definitely substantial can be said to give a good generalization unless it is a negative one such as different stress produces different eating and weight patterns in the same individual as well as in others. Hard-pressed, one also offers forth this: with increasing anxiety generally one eats more. This is reflected as an increase in weight. (18)

Intelligence quotient and insight: While some studies say that the obese have a greater amount of intelligence others do not agree. The same can be said of acquired insight by the individual. It is the opinion of the author that with all the differences expressed that indeed there is no difference between the obese and non-obese in either I. Q. or insight. Dorris and Stunkard (5) state that in their opinion there is an "ego defect preventing an adequate integration of unconscious material which has become conscious in the course of treatment in the obese." This can also be said of many non-obese.

Hunger denial: Stunkard (25) reported in a remarkable, fine

study of gastric motility with balloons that hunger denial occurs in the obese. It occurs most often in those individuals "subject to conflict over eating" and in those "experiencing intense social pressure about eating." This "hunger denial" is hinted at but not expressed as such by innumerable observers in caloric intake data collected.

Eating patterns: Stunkard (27) again has defined the eating patterns well. They are classified as the binge eater, similar to the binge drinker, who eats normal amounts of food until succumbing to a stress and then eating exorbitantly for a period of time. Another type of eater is the nibbler. This is similar to the common conception of the Mid-West farmer's wife who does much preparing of food, constantly sampling as it is being prepared. Finally, there is the previously mentioned night eater. The night eater tends to binge in a period of life stress, and gains weight thus. He is also peculiar in that he is resistant to diet therapy, developing many complications when diet therapy is attempted. This particular syndrome, the night eating syndrome, is unique to obese individuals.

Treatment: One would be led to suspect that there are as many diets for the treatment of obesity as there are physicians treating the patients. It is not the purpose here to provide a critique of the varieties of diet therapy available to the individual patient. Rather it is to emphasize that along with

a diet one is to couple a form of therapy which is recognized by psychiatrists as psychotherapy. In a series of ninety-three patients Nicholson (21) in 1946 found that in each patient there was an emotional problem. "Psychotherapy resulted in a higher percentage of successful results than other methods studied." He concludes, therefore, that psychotherapy is essential for permanent weight reduction. Rennie in 1940 (23) stated that obesity was a manifestation of personality disturbances. He concluded that the problem involved the "total personality in a rather sweeping manner." "Therapy may be doomed to failure unless the fundamental nature of disturbances is understood."

There are a number of facts found to influence the success of treatment. On the whole, men are far more likely to lose weight on diet therapy than women. The intelligent are more successful than those less intelligent. The adult obese are easier to treat than the juvenile obese.

#### CASE HISTORIES

1. M. C., #5-38-23, is a 54 year old single white female. She started gaining weight after a tonsillectomy and adenoidectomy when she was 14-15 years of age. She completed high school but had very few contacts with boys. Her parents died when she was 20 years old of "heart trouble." Her mother weighed in excess of 300 pounds. Her father was slender. She is a member of a family farming an estate of 320 acres. The income is shared by five members of the immediate family as well as four nephews and nieces. These five members all live together. All are single, all are in excess of 200 pounds. (There are three older brothers and one older sister.) Two brothers are dead, one in infancy, the

other of heart trouble. Two sisters are dead, one with heart trouble, the other in a state hospital, having "lost her mind after childbirth." She has been diagnosed as a passive-dependent personality.

2. P. G., #5-28-66, is a thirty-one year old single, white, male. He was slightly heavy, he states, up to the age of thirteen. At this age the family moved from New York City to Georgia. He also started to work at a grocery store as well as going to school. He feels that he began eating as a substitute for being with people. At the age of seventeen he weighed more than 300 pounds. In 1958 he weighed 212 pounds, his lowest weight since high school. In August of 1960 he weighed 447 pounds. He states that his father is heavy. His mother was once heavy but on a strict diet, which she still maintains, she remains slender. He is an only child. He is a "nibbler", and as it was termed, one who is on a constant binge. He was a research assistant in one of the laboratories at University Hospital. He is now engaged in graduate work.
3. G.T., #5-14-72, is a twenty-three year old, separated, Negro, female who is a nurse aide at a local hospital. At the age of 15 she weighed 145 pounds. Following her first pregnancy (illegitimate) she had a weight gain, but returned to 145 pounds. After her second illegitimate pregnancy at the age of 18 she returned to 152 pounds. From January 1958 to February, 1959, she gained fifty pounds to weigh 202 pounds. Her first marriage was in 1960, when she weighed 185 pounds. This was apparently a bigamous marriage. Her husband was a very heavy drinker who "beat" G.T. There was a separation which was associated with a weight gain. In a second marriage in January, 1963, followed by an incomplete abortion which necessitated a dilatation and curettage, she gained from 185 pounds to 224 at her entrance to the clinic.
4. B. T., #5-45-53, is a twenty-nine year old, single, white, female. She is a registered nurse. She weighed 214 pounds in 1952, and lost 20 pounds on a Mayo Clinic diet. She lost 20 pounds again on the same diet in 1956. At one time in 1956 she weighed 159 pounds. She weighed 169 pounds in 1959. She weighed 177 pounds at entrance to the clinic. Her father, with whom she lives, and uncles are heavy. Her maternal relatives were less

heavy, but tended to be overweight. She readily gets depressed on diets, as well as feeling anxiety.

5. G. M., #58-21, is a twenty-three year old, separated, white, female. At the age of thirteen she weighed 133 pounds at which time she was not married. She became pregnant, gaining much weight but losing it following the pregnancy to 145 pounds. During subsequent pregnancies she gained ~~she gained~~ persistently until she weighed 250 pounds. Her children are 7, 6, 5, 3, and six months. She is an only child. Her father was killed at Pearl Harbor. Her mother remarried when G.M. was two years old. Two years later the husband went "berserk", shooting her mother with a shotgun, necessitating a fore quarter amputation. He then killed himself. The patient was unharmed physically. The mother of the patient subsequently remarried shortly before the patient's marriage. Her husband (the patient's) started drinking heavily after her first pregnancy. He was discharged from the service one year ago. She feels that her husband lost almost every household article due to his own indiscretions with drinking. Currently she is separated from her husband with divorce proceedings pending soon. She is a "night eater."
6. G. P., #5-14, is a thirty-eight year old, married, white, female. She reports an increased weight since 11 years old, coinciding with the time her mother remarried. Her father died when she was seven years old. The patient was the "baby" of the family and "got everything." Her mother (who is short, moderately heavy, and diabetic) remarried when the patient was eleven. Her step-father was "mean", not permitting the patient to go places or spend money. Menses began at age 13, but ceased after five months. They resumed again at 17 years with the aid of hormones. She has not been pregnant, even though she has been married for seven years with no contraceptive practices. She has, however, raised a nephew and a niece, products of a broken home. She spoke in an apologetic manner with a child-like voice. She is a "nibbler."
7. B. R., #2-37-20, is a 68 year old, white, widowed, female. She also has a long standing arteriosclerosis with cardiovascular disease, mild to moderate congestive heart failure, and varicosities. There is a positive family history for obesity. She is a "nibbler."

8. M. T., #3-81-08, is a 60 year old, married, white, female. She is a "nibbler," who has been followed in Psychiatry Clinic at University Hospital for her increased weight. She has been married for thirty-seven years, and has been overweight for the bulk of these years. She is one of six children, two of whom are diabetic. There has been a progressive weight gain since 20 years of age, although she states that she was "heavy" as a child. Her heaviest weight was 240 pounds. Early in her married life, one of her children was run over by a car, an accident which the patient witnessed. Two other children are living and well.
9. V. W., #1-76-73, is a 33 year old, single, Negro, female, para 7-0-0-7, who did not become heavy until 1954. The patient says she began putting on weight during her last pregnancy. She has continued to do so until now. There is no family history of obesity. She had never been on diets prior to her coming to this clinic. She is a "binge eater."
10. M. F., #1-32-03, is a 48 year old, married, white, female, whose first weight gain was at ten years of age due to, she feels, school problems. She was very tall and was the butt of many remarks made by class mates. She also repeated some grades. She weighed 144 pounds when married at age thirty-two. There was a marked increase in weight when she discovered that her husband was "sleeping out." This was also at the same time as her first pregnancy. She weighed 189 pounds after delivery.
11. M. W., #4-83-20, is a 45 year old, single, white, female. She began gaining weight at eight years of age. She was the eighth of eleven children. She describes herself as the "scapegoat" of the family, who was punished unjustly for the antics of her siblings without a chance for defense. She says that she was "terrified" of her father, and never had a chance to be close to her mother. She was never close to her siblings, nor did she have any childhood friends. She now lives alone with few friends or interests. She admits to feelings of "loneliness and futility." She states that she eats not because she is hungry, but because she is trying to over-come her despondent and anxious feelings.
12. E. L., #4-11-30, is a 64 year old, married, white,

female, who is a former teacher. She is the mother of seven children. She married into a heavy-eating family in spite of no family history of obesity. She describes herself as a "nibbler."

13. B. H., #53-14, is a 19 year old, single, white, female. She began gaining weight at approximately the same time she had rheumatic fever when aged six. She weighed 92 pounds in October of 1952 and was 53 inches tall. She weighed 140 pounds at the age of eleven. There has been a steady increase to 169 pounds in 1957, 188 pounds in 1959, 210 in 1960, to 228 pounds in July of 1963, when she measured 64 inches tall. In July she was referred to Obesity Clinic but failed to keep her appointment. In fact, she has not been seen in any clinic at University Hospital since.
14. D. B., #4-17-48, is a 20 year old, separated, white, female. She has been heavy since age eight. She states that up to age five her mother had to force her to eat. Her father left home when she was three. Her mother subsequently remarried. Her stepfather was "nice" she states, but he did drink. She recalls that her stepfather broke her (the patient's) arm when she attempted to stop him from choking her mother. During her clinic visits her husband left the family, after losing his job. At this time, she developed intractable vomiting. He subsequently attempted to break into her home after he had left. She failed to come to the clinic after three visits, as well as failing to come to any of the other clinics. Her father was obese as is a brother. Her mother and sister are thin. She is a "binge eater."
15. A. D., #3-93-56, is a 28 year old, single, Negro, female. She feels it is a compulsion to eat. She has not been under 200 pounds since age fourteen. Her mother was obese, her father was not. She is an only child. She eats when she is "angry, nervous, or depressed." There was a marked increase in weight at puberty, during pregnancies, and following the death of one of her children. She failed to return to the clinic after four visits, and has not attended any other clinic since that time.
16. D. A., #6-82, is a 28 year old, separated, white, female, who weighed 175 pounds when married and 354 pounds in April, 1963, when her husband "left with another woman." At age 12 she was thirty-one pounds overweight.



She gained approximately fifty pounds with each pregnancy; the oldest child is retarded, the youngest is losing his eyesight. She failed to return to the clinic after three visits and returned only once to any other clinic, this visit being made four months after she was seen in Obesity Clinic. She states that when "depressed" she could eat "a full meal just after finishing one."

17. G. W., #51-61, is a 29 year old, married, Negro female. She has eight children, the oldest being twelve, and the youngest one. She admits to increased eating with "worry and nervousness." Her father was heavy and her mother was slightly obese. Her parents were divorced before the patient was born, but both are described as having enough time for the children. Her mother had remarried, but it appeared to G.W. that she was unhappy in this second marriage. At the age of ten, the patient weighed 130 pounds. In the last four years she gained eighty pounds to 265 pounds. She attended the clinic thirteen times, and then failed to reappear in any clinic.
18. G. G., #3-65-04, is a 17 year old single, white, female. She lives at home with her mother and father. She is an only child. A younger sibling died shortly after birth. She has been on and off diets since the age of six. Her peers have antagonized her because of her weight since the sixth grade. She has a family history of obesity. Her maximum weight was 263 pounds in July, 1963. When fourteen years old she weighed 190 pounds.
19. L. T., #79-14, is a 15 year old, single Negro, female. She was obese as a child. She failed to come to the original appointment for the clinic, and has not been seen in any clinic since then.

#### METHODS

This study involves the first nineteen patients to enter the Obesity Research Clinic at the University of Nebraska Hospital, and a review of their records. The clinics met on

the second and fourth Tuesdays each month. Patients who had to travel from out-state Nebraska usually came in once a month. Those residing in Omaha with little transportation difficulties were scheduled to attend each time the clinic met.

At the patients' initial presentation to the clinic or in another clinic, prior to their referral, a brief dietary history was elicited, PBI and glucose tolerance tests were done, and instructions in the diet were given.

The diet used is the Gordon diet, as determined by Edgar Gordon, M.D., of the University of Wisconsin.(9) It consists of a daily intake of 100 Gm. of protein, 70Gm. of carbohydrate, and 50 Gm. of fat. Therefore, the daily caloric intake is 1230 calories.

The clinic is staffed by two internists, one a female (MJH), who has had advanced training in endocrinology, and the other, a male, (VW), who has had advanced training in psychosomatics. MJH is a full-time staff member of the Internal Medicine Department of the College of Medicine. VW is a part-time member of the faculty of the Internal Medicine Department, maintaining a full time private practice in one of the larger cities of Nebraska some distance from Omaha. A third member of the staff of the clinic is a certified psychiatrist.(RM) There is also a dietician from the University Hospital staff who is present each time the clinic is held. At various times there were senior medical

students on endocrinology service assisting with the clinics, as well as the author whose interest was from a different aspect than the other students.

There was an attempt made for the various members of the permanent staff to see the patients at alternating appointments; however, this was not entirely followed. The psychiatrist saw the patients, after they had been seen by one of the internists, for evaluatory or merely supportive purposes.

At each clinic, questions were answered, perhaps more history detailed, weight (on the same scale each time) recorded, and blood pressure and pulse were recorded. Starting on December 10, 1963, the following (See Table #1) series of questions were administered with minimal contact by the author at the time of administration. This was usually done prior to the patient's being seen by either of the internists. Blood pressure and pulse were taken at this time. The psychiatrist saw all of the patients after the others had completed their work-ups.

The patients for the clinic were obtained by referral from clinics or by the request of the patient. Clearance for entrance was made through one of the internists. (MJH) The only prerequisite was that one was unsuccessful on previous diet regimens. No chronic disease prevented a patient from entering the clinic; in some cases this is what prompted the referral, for nothing definitive curatively could be done until the excess weight was

Table 1.  
Form given to each patient at each clinic visit

BP		
Pulse		
During the past two weeks have you had:	Yes	No
1. An increased amount of sweating	_____	_____
2. Pounding of the heart	_____	_____
3. Dry mouth	_____	_____
4. Cold, moist hands	_____	_____
5. "Gas on the stomach"	_____	_____
6. Swimming in the head or dizziness	_____	_____
7. A decreased amount of sweating	_____	_____
8. Sick in stomach	_____	_____
9. Lump in throat	_____	_____
10. Faint feelings	_____	_____
11. Trouble going to sleep	_____	_____
12. Headache	_____	_____
13. Diarrhea or loose bowels	_____	_____
14. Waking up at night	_____	_____
15. Nervousness	_____	_____
16. Feeling much better	_____	_____

removed.

The purpose of the questionnaire was an attempt to ascertain the anxiety of the various patients as weight changed. It was drawn from an article on the physiological aspects of anxiety by Ebaugh.(6) Of the sixteen questions asked, the final one will not be used in the interpretation of data, because of its subjective connotation to the patient. Presumably, those happy with the diet and the feeling of about to lose or in the process of losing weight should answer "yes".

The sum of the "yes" and the sum of the "no" column were determined. (Each of the fifteen questions were given a value of either plus one yes or plus one no.) These were then compiled to note whether any patients evidenced physiological signs of

Patient	Sum of yes	Sum of No	Remarks.
1.	1	14	Initial visit.
	0	15	One-half pound loss.
2.	4	11	Six pound gain.
	5	10	Fifteen pound gain.
3.	Has never been to the clinic to have the questionnaire administered.		
4.	3	12	Five and one-half pound gain.
	4	11	No weight change.
	8	7	One and one-half pound loss.
5.	7	8	One pound loss.
	3	12	One-half pound gain.
	4	11	Six pound loss.
6.	3	11	One and one-half pound loss.
	6	9	One pound gain.
7	4	11	Had not been in for six weeks.
			Two pound loss.
8.	7	8	Three pound gain.
	7	8	Five pound gain.
9.	9	6	Initial visit. Failed to return.
10.	8	7	Six pound gain.
11.	12	3	Three pound loss.
11.	4	11	Seven pound loss.
	5	10	Five pound gain.
12.	4	11	Had not been in for six weeks.
			Six pound gain since last visit.
13.	Never came to clinic		
14.	Dropped out prior to administration of questionnaire.		
15.	Dropped out prior to administration of questionnaire.		
16.	Dropped out prior to administration of questionnaire.		
17.	Dropped out prior to administration of questionnaire.		
18.	5	10	Seven pound loss.
	8	7	One pound loss.
19.	Never came to clinic.		

Table 2.  
Patient anxiety level.

anxiety or not. This is charted in Table # 2. The change of level of anxiety was also correlated with the weight change since the previous visit. Secondly, the sums of all the "yes" and "no" columns of all questionnaires administered were determined (see table # 3). And third, a table of change in an individual's

physiological signs of anxiety was recorded with correlation of an increase or decrease of anxiety and an increase or decrease in weight.

Limitations of study: This study was done on the initial nineteen subjects to have scheduled appointments to the obesity research clinic. This then was a study on a self-selected group (those desiring, presumably, a change of weight). No attempt was made to establish a control group. No follow-up was attempted for those patients who failed to come or dropped-out in the course of therapy.

#### RESULTS

1. Laboratory studies: The PBI ranged from 3.4 to 6.7. The mean was 5.1 micrograms per cent. The glucose tolerance test (100 grams given orally) was run with varying degrees from a flat curve to one of a diabetic type. Means at varying times were, fasting 81mg%; one-half hour 111mg%; one hour 116 mg%; one and one-half hours 108 mg%; two hours 119 mg%; three hours 84mg%; and four hours 72 mg%. Cholesterol levels were run in ten patients. The range was from 127 mg% to 261 mg%. The mean of these was 188 mg %. Total lipids were run on five patients. The range was from 530 to 980. The mean was 814 mg%.

2. Weight change: The total weight of 17 patients was 4,573 pounds or a mean of 269 pounds. The range was from 379 to 172 pounds. Three patients gained 36.5 pounds, or a mean of



12.2 pounds. The range was from 17 to 4.5 pounds. Fourteen patients lost a total of 180.5 pounds, or a mean of 12.9 pounds. The range was from 0.5 pounds to 41.5 pounds. Of the nineteen patients initially to be seen two failed to show in any clinic in the University Clinic. Of the 17 who at least appeared, there was a mean loss of 8.5 pounds. Of the thirteen patients who have not missed more than the last two appointments, there was a mean loss of 7.8 pounds.

3. Drop-out: Two of the nineteen patients failed to make their initial visit; a 10.5 per cent failure. Four other patients failed to return after attending the clinic for short times, a 23.5 per cent failure to return.

4. Influence of the interviewers: All patients were seen by either one or the other of the internists and on very few occasions both saw the patient at the same visit. Patients seen by V. W., in a total of 46 visits, experienced a net loss of forty-one pounds, or a loss of 0.89 pounds per visit. Patients seen by M. J. H., in a total of 53 visits, experienced a net loss of 101 pounds, or a loss of 1.90 pounds per visit.

5. Sex: All of the patients, except one, were female; or among seventeen, there was an incidence of 94 per cent females.

6. Family history: In a review of the charts, there were ten patients who were noted to have parents and/or siblings that were "heavy". Unknown family history at the time of this



writing were seven in number. Those who had no family history of obesity were two.

7. Personality: Only three patients had a definitive diagnosis recorded in the chart by a psychiatrist; two of these were recorded as passive-dependent personality; the other as a passive-aggressive personality. The rest of the patients had a definite passive overlay in their personality structure.

8. Type of obesity: (juvenile or adult.) In a review of the clinic charts nine of the nineteen patients are the juvenile obese type. Ten of the nineteen are of the adult type.

9. Type of eater: In a review of the charts, six of the patients are "nibblers", two are "binge eaters", one is a "night eater", and ten are unknown, the history not having been elicited.

10. Drop-out: Two of the juvenile obese failed to come to the clinic. No adult obese failed to come initially, but two of the adults failed to return. Two of the juvenile obese failed to return to the clinic.

11. Weight change related to type of obesity: One adult patient has gained 4.5 pounds. Two juvenile patients have gained a total of 32 pounds, one 17, and the other 15 pounds. Eight adult patients have lost a total of 93.0 pounds or a mean of 11.6 pounds. The range was from 0.5 pound to 41.5 pounds. Five of the juvenile group have lost a total of 94.5 pounds, or a mean of 18.9 pounds. The mean weight change of the adult obese is

(-) 8.8 pounds, whereas the mean weight change of the juvenile obese (not including those who failed appointments) is (-) 8.9 pounds.

12. Weight change related to the type of eater: (using seventeen patients as a base). The one "night eater" has lost 41.5 pounds; the "nibblers" have a mean loss of 2.9 pounds; and the "binge eaters", a mean loss of 5.5 pounds.

13. Reactions to stress by history: Twelve of the nineteen patients noted weight gain at a period of stress (pregnancy, family catastrophe, worry, or anxiety). In the other seven patients, one was able to ascertain from the history, a positive relation between weight gain and stress.

14. Weight change in only children: Four of seventeen patients were only children. One of these failed to return. There was a total loss of 53 pounds, a mean of 13.2 pounds. One of these patients gained fifteen pounds.

15. Patient explanations of weight gain: a) trouble getting started on work, b) Christmas, c) Son injured in an automobile accident which produced anxiety, d) husband ill, e) to enter hospital for a surgical procedure, f) son did not come to visit, g) aunt died, h) family reunion, i) daughter moved in after leaving husband, j) father died, k) death in the family.

16. Patient explanation of weight loss: a) following diet, b) initiation of divorce proceedings, c) close to sister

Table 3.

Sum of answers to various physiological signs of anxiety as expressed by the patients answers.

SIGN	YES	NO
1. An increased amount of sweating	2	22
2. Pounding of the heart	5	19
3. Dry mouth	11	13
4. Cold, moist hands.	1	23
5. "Gas on the stomach."	14	10
6. Swimming in the head or dizziness	11	13
7. Sick in stomach	7	17
8. A decreased amount of sweating	2	22
9. Lump in throat	2	22
10. Faint feelings	9	15
11. Trouble going to sleep	12	12
12. Headache	17	7
13. Diarrhea or loose bowels	4	20
14. Waking up at night	18	6
15. Nervousness	10	14

now.

17. Three of the four patients who failed to return showed an increase in weight in their last visits in spite of an overall decrease in weight.

18. By table 2, one can see that there are significant physiological signs of anxiety in all of these patients except one. She, however, lost only one-half pound on the diet in two weeks. Patient 2 showed an increase of anxiety and also a weight gain of fifteen pounds. Patient 4 showed an increase of anxiety far more marked than number 2. Since administration of the questionnaire she has had a loss of only one and one-half pounds. Patient 5 showed an initial decrease in anxiety with a slight gain in weight; then an increase in anxiety with a six pound loss. Patient 6 had an increase of anxiety with a one pound gain

of weight. Patient 7 had not been into the clinic for quite a length of time but had a mild anxiety and a two pound weight gain since her last visit. Patient 8 had no change in level of anxiety and had a five pound weight gain. She, however, failed to return for her last clinic appointment. Patient 9 had a very high level of anxiety on her initial visit. She failed to return for her next clinic appointment. Patient 10 showed a marked increase in anxiety and a five pound weight gain. Patient 11 had an increase in anxiety and a three pound weight loss. Patient 18 had a substantial increase of anxiety and had a one pound loss of weight.

One sees here that there were changes in anxiety levels in three groups: a) increased, b) decreased, c) no change. There were eight questionnaires which showed an increase of anxiety. Three of these gained weight (15, 1, and 5 pounds); four lost weight (1, 5, 6, 3, and 1 pound). One showed no weight change. Two questionnaires showed decrease in anxiety. One had a weight gain of one-half pound. The other had a weight loss of one-half pound. One questionnaire had no change in anxiety. She had a five pound gain.

19. Table number 3 shows the physiological signs of anxiety among the thirteen patients to whom the questionnaire was administered. The most common physiological signs of anxiety were 1) dry mouth, 2) "gas on the stomach," 3) dizziness, 4)

Table 4.  
Changes in physiological signs of anxiety.

SIGN	Same	Yes to No	No to Yes	Anxiety	Weight
1.	9	1		Increase	/ 1
			1	Increase	- 1 $\frac{1}{2}$
2.	8		3	"	-1 $\frac{1}{2}$
				"	-3
				Same	/ 5
3.	8	1		Increase	/15
			2	"	-6
				"	-3
4.	10		1	"	-3
5.	9	1		Decrease	/1 $\frac{1}{2}$
			1	Increase	-1
6.	6	3		Decrease	/1 $\frac{1}{2}$
				Increase	Nochange
				"	-6
			2	"	-1 $\frac{1}{2}$
				"	-3
7.	10		1	"	/1
8.	10		1	"	Nochange
9.	10		1	"	/-5
10.	7		4	"	-1 $\frac{1}{2}$
				"	-6
				"	-3
				Same	/5
11.	6	1		Decrease	/ $\frac{1}{2}$
			4	Same	/5
				Increase	-6
				"	-1
				"	/1
12.	7	1		"	Nochange
			3	"	-1 $\frac{1}{2}$
				"	/6
				Same	/5
13.	8	1		Increase	-6
			2	"	/1
				Same	/5
14.	10	1		Decrease	- $\frac{1}{2}$
15.	7	1		"	/ $\frac{1}{2}$
			3	Increase	-1 $\frac{1}{2}$
				"	/1
				"	-1

trouble going to sleep, 5) headache, 6) waking up at night,  
and 7) nervousness.

20. Table 4 shows the changes of physiological signs of anxiety. This includes wither their appearance or disappearance and an associated increase or decrease of anxiety coupled with weight loss or weight gain. The greatest number of changes appeared in the no to yes group (those answering no who changed their answer to yes with administration of the next questionnaire.) Twenty-nine changes from no to yes were made; twenty-three of those were in patients who showed an increased anxiety. Sixteen of these patients lost weight (range from one-half to six pounds). Twelve of them gained weight (range from one to fifteen pounds). One patients weight remained the same. Eleven changes appeared in the yes to no group ( those answering yes who changed their answer to no with the administration of the next questionnaire). Six of these patients showed an overall increase of anxiety. Five of these patients gained weight; four lost weight and two remained the same. The most changes were made in these categories of the questionnaire: 1) nervousness, 2) headache, 3) trouble going to sleep, 4) faint feelings, and 5) swimming in head or dizziness.

#### DISCUSSION

Obesity has been presented from many different aspects in the past. Among these have been included metabolic disturbances, genetic disturbances, success in therapy, types of obese and the degree of success with each in diet therapy. This report is

a summary of testing done on the initial nineteen subjects referred to obesity research clinic at the University of Nebraska Hospital.

With the presumption that obesity is a defense, a questionnaire was administered to the patients in the obesity clinic to ascertain physiological signs of anxiety in obese individuals on diet therapy.

The findings here indicate that there are significant physiological correlates of anxiety in the obese. These correlates centered around (generally) sleep disturbances, headaches, and "nervousness" as expressed by the patients. Furthermore, as an obese individual persisted on the diet therapy (in spite of a loss or gain of weight) he becomes more anxious than he was previously.

In discerning that there was a ten per cent failure to come to the clinic and a twenty-three per cent drop out of those who did attend the clinic, it would appear that the process of losing weight, or the thought that weight may be lost was a factor in the failure or drop out. As detected in the results, there was an increase in anxiety prior to a failure to return for a clinic appointment or failure to return.

Anxiety changes are apparent generally by an increase in anxiety rather than by a change in sign of anxiety. Also once a sign develops in an obese patient it persists until there is

a drop out or a high weight gain has been achieved.

One also notes that there has appeared among these patients a weight plateau (little change of weight), indicating a failure to persist on the diet as prescribed. With this there is yet seen an increase of anxiety. It would appear therefore that two factors play a role in producing an increase of anxiety in obese patients. One that constant surveillance of an individual's success on a diet produces a rise in anxiety. The other that loss of weight in itself increases anxiety.

A defense is that structure or adjustment which assists an individual in dealing with his stresses or emotional needs. From the above discussion one can conclude that obese individuals are significantly anxious. The physiological signs of anxiety increase as weight is lost inferring that obesity does allay anxiety. In the absence of weight loss there is also noted an increasing anxiety inferring a reaction to constant surveillance to diet therapy. This factor could possibly be further evaluated to include controls who had not sought or were not under medical therapy for obesity. (Accurate assessment of this inference presents difficulty.) Even by verbal report obese individuals admit to gain of weight at times of stress (death, pregnancy, surgery, illness). Because removal of obesity (or loss of weight) produces an increased level of anxiety, one can then conclude that obesity does allay anxiety, acting therefore as a



structural defense enabling the individual to better cope with his stresses and/or emotional needs.

#### CONCLUSIONS

1. To the initial nineteen patients of an obesity research clinic at the University of Nebraska clinics a review of records and administration of a questionnaire ascertaining the physiological signs of anxiety was done.

2. It was determined that obese patients manifest high levels of anxiety.

3. Obese patients become more anxious as diet therapy progresses, it was inferred. This was due to 1) loss of weight and 2) constant surveillance of weight changes by medical personnel.

3. It was concluded that obesity does act as a defense.

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