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Anorexia Nervosa: The Enigma of Self-Starvation

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In previous essays, I have discussed fasting.[1] As one who occasionally engages in the practice, I noted that moderate fasting may be a good way for some people to stay trim and keep healthy. But fasting, like anything else, can be taken to extremes. One extreme and dangerous form of fasting, involving virtual self-starvation, is the strange illness known as anorexia nervosa.

Anorexia nervosa is an eating disorder that causes its victims to pursue an obsessive, exaggerated diet—a diet in which food is avoided to the point of emaciation and even death. Since the condition has only recently begun to receive popular attention in magazines and television, it is somewhat surprising to learn that anorexia has been the subject of serious research for more than a century.

One of the first clinical observations of the disorder, in fact, was recorded almost 300 years ago. In 1689, English physician Richard Morton described a woman who inexplicably refused virtually all food, and who resembled "a skeleton only clad with skin."[2] (p. 5) However, the first real recognition of anorexia as a clinical entity occurred in the 1870s. William Gull, an English physician, and Jean Lasegue, a French psychiatrist, made simultaneous observations of the disorder.[3] (p. 1) They observed an affliction of young women which involved refusing to eat, extreme weight loss, amenorrhea (cessation of menstrual periods), constipation, and slow pulse and respiration. Perhaps most significant was an absence of any signs of primary organic disease.

Gull termed the affliction "hysteric apepsia," and later changed the name to "anorexia nervosa," meaning "nervous loss of appetite."[3] (p. 1) Gull's name for the condition has become the accepted term, although it is something of a misnomer. Actually, anorexics retain their appetite but choose to drastically limit their food intake.[4]

At the turn of the century, research on anorexia continued in the wake of Gull and Lasegue's observations. The German pathologist M. Simmonds caused some confusion with his account of the death of an emaciated woman who, on autopsy, was found to have a damaged pituitary gland. From 1914 until the mid-1930s, cases of anorexia were incorrectly identified and treated as a pituitary disorder—as Simmonds's disease.[5] Although Simmonds's theories were discounted, the controversy surrounding anorexia continues, to an extent, up until the present day. There is still some contention as to whether the condition is purely psychological in origin, or whether it is precipitated by a primary disorder of the endocrine system.

In any event, anorexia nervosa, as viewed by Gull, Lasegue, and others, is still very much with us in the modern world. One British study, by A.H. Crisp and colleagues, Department of Psychiatry, St. George's Medical School, London, determined that one out of 200 girls

over the age of 12 exhibited the disease in serious form, as did one out of 100 young women between the ages of 16 and 18.[6] A Swedish study reported one serious case per 155 teenage females.[7] Precise statistics on current incidence in the US do not seem to be available, but officials at the National Association of Anorexia Nervosa and Associated Disorders (ANAD) estimate that anorexia strikes one out of every 200 teenagers in this country, nine out of ten of them female.[8] There does seem to be a consensus that the incidence is increasing.[9]

Until recently, the prevailing orthodoxy held that anorexia afflicts white adolescent females, primarily from the middle and upper classes. But anorexia has recently been reported among poor people, and among blacks and other minorities who had not exhibited the condition before. It is possible, however, that these changes merely reflect improved techniques for detecting and diagnosing the disease. There is also evidence that anorexia is increasingly affecting older age groups.[7] (p. 100-19) The incidence of anorexia in males remains rare, generally reported as less than ten percent of total cases.[10]

The American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders (DSM III)* lists specific criteria for the diagnosis of anorexia.[11] The main features, specified as always present, are behavior directed toward losing weight, weight loss, peculiar patterns of handling food, intense fear of gaining weight, disturbance of body image, and, in females, amenorrhea. Secondary features, not always present, include denial of illness and resistance to therapy. The disorder may also delay or stunt psychosexual development in adolescents, and cause adults to lose interest in sexual activity.[11]

There are other, similar sets of diagnostic criteria, such as the one developed by psychiatrist Paul Garfinkel and psychologist David Garner, Toronto General Hospital. They specify a self-inflicted loss of weight, achieved either through avoidance of food, self-induced vomiting, abuse of purgatives, excessive exercise, or some combination of these. Garner and Garfinkel also specify a secondary endocrine disorder which shows up in the female as amenorrhea and in the male as a reduction of sexual interest and activity. Lastly, there is a psychological disturbance that has as its central theme a morbid fear of being unable to control eating and hence becoming too fat.[7] Another set of criteria, developed by John Feighner and colleagues, Department of Psychiatry, Washington University, St. Louis, resembles the above sets, but calls for onset of the illness before age 25 and at least a 25 percent loss of body weight.[12] The Feighner criteria were designed primarily to guarantee compatibility of patients in clinical research studies. Therefore, they are more restrictive than criteria used solely for diagnosis.

Ironically, anorexics may become obsessed with food even as they refuse to eat it. Katherine A. Halmi, Department of Psychiatry, New York Hospital, White Plains, New York, reviewed some psychological aspects of anorexia in a chapter of the *Comprehensive Textbook of Psychiatry/III*. She notes that it is not unusual for anorexics to collect recipes, or even to assume all the family cooking chores.[13] Garfinkel notes that the anorexic also experiences other effects of starvation on thinking, feeling, and behavior. There is poor concentration, indecisiveness, a narrowing of interests, mood fluctuation, and, at times, depression.[14]

Anorexics don't eat normally because they have a morbid fear of gaining weight. This fear can drive an anorexic to ruinous physical consequences. Some patients lose as much as 50 percent of their original body weight. The emaciation can be extreme. Indeed, anorexics experience discomfort caused by their jutting bones even as they insist they need to lose more weight. The skin be-

comes dry and cracked. A fine, downy growth of so-called "lanugo" hair will often show on cheeks, neck, forearms, and thighs. The temperature of anorexics is often abnormally low, and they may complain constantly that their hands and feet are cold. Constipation is also common.[15]

The medical effects of anorexia are, of course, serious. Anorexics tend to exhibit bradycardia, an abnormally slow heart rate—60 beats per minute or less. As many as 50 percent of these patients occasionally binge on food and then immediately induce vomiting to protect themselves from any weight gain.[14] This binge-purge syndrome, known as bulimia, affects not only anorexics, but also many persons who otherwise maintain a near-normal body weight. Bulimia, once considered a subcategory of anorexic behavior, has become a separate and serious health hazard in its own right.[16]

In fact, studies comparing bulimic anorexics with nonvomiting anorexics have demonstrated that bulimics exhibit markedly different psychological traits. One study by Garfinkel and colleagues determined that bulimics showed a higher degree of impulsive behavior than fasting anorexics, including kleptomania, drug and alcohol abuse, self-mutilation, and suicide attempts.[16] Another study, by Regina C. Casper, Department of Psychiatry, University of Illinois, and colleagues showed that bulimics manifested greater anxiety, depression, and guilt, and had more somatic complaints than anorexics who did not induce vomiting.[17] Bulimics' overeating episodes appear to have little to do with simple hunger. Gerald Russell, a psychiatrist at Maudsley Hospital, London, has interpreted bulimics' gorging on food as a response to an unfulfilled emotional need.[18] Self-induced vomiting serves to alleviate guilt caused by the binge and neutralize the fattening effects of the food.

The consequences of self-induced vomiting are especially grave. The resulting low serum potassium levels, a condition known as hypokalemia, can lead to cardiac arrhythmia and sudden death. And victims of anorexia and bulimia do die, from heart failure, from the general effects of malnutrition, or from unknown causes.[19] H.-C. Steinhausen, Department of Child and Adolescent Psychiatry and Neurology, Free University of Berlin, Federal Republic of Germany, reviewed mortality statistics from several outcome studies. He found that the figures on mortality in anorexia varied widely, anywhere from one to 25 percent of total cases.[20] Generally, though, the mortality rate is reported at between five and ten percent of cases.[21]

Why do anorexics embark on this destructive course of self-starvation? One early theory, prevalent in the 1940s, held that anorexia involved an unconscious wish to be impregnated through the mouth, which the patient guiltily rejected by avoiding food. According to a Boston group of psychiatrists, the amenorrhea resulted directly from the patient's unconscious desire to be pregnant.[22] This theory has given way to more complex social, psychological, and biochemical hypotheses. Today the precise etiology and ideal course of treatment for anorexia are matters of controversy.

One theory implicates western civilization's version of the "ideal" body shape for women, and the relentless pressure for women to be thin. Garner and Garfinkel undertook a study in which they gauged changes in the measurements of *Playboy* centerfold models and contestants in the Miss America pageant over a 20-year period. They found a trend toward lower weight and a more androgynous, "tubular" figure. The feminine ideal, they conclude, is presented as a slender figure, even though improved nutrition over the years has resulted in higher average weights for women.[23] Garner and Garfinkel also found a high prevalence of anorexia among models and in dance

schools, where there is enormous pressure on women to be thin for professional reasons. This finding supports the view that external, societal influences can play a large part in the development of the disease.[14]

But it does not even take a scientific approach to notice the mass media's emphasis on thinness as the ideal feminine shape. Anyone even remotely familiar with magazines and television has noted the prevalence of skinny models in advertising, who no doubt serve as examples for young women.

Some researchers have taken a psychological approach to anorexia. Garfinkel, in reviewing the psychological literature in the field, has assembled a list of possible predisposing factors. Among the factors that may contribute to the development of anorexia in an individual are an impaired sense of personal identity, and subsequent inability to function apart from one's family; a perceptual disturbance which shows up in anorexia as a pronounced inability to perceive one's body size; high birth weight or childhood obesity; perfectionism, or a personality in which self-worth is highly regulated by factors outside the self; and certain family factors including parents who tend to be older when the individual is born and who may have a history of depression.[24]

It is not uncommon for some stressful life situation to precede the onset of anorexia. Halmi and colleagues conducted a study which determined that anorexia commonly occurred in girls at the ages of 14-1/2 and 18. Halmi noted that at these ages a girl may be facing greater independence in the form of a move up to high school or departure from home to college or a job.[25] Other situations which may precipitate anorexia include a death or serious illness in the family, failure at school or work, the necessity to switch jobs, or some kind of sexual conflict. Often the anorexic's obsessive dieting has been initiated by a friend or family member's casual mention that the patient needed to lose a few pounds, or by the teasing of classmates about being overweight.[26] (p. 258)

While a single event may trigger the onset of anorexia in some cases, most researchers believe that complex psychological forces are at work. Crisp views anorexia as a "phobic avoidance" of the demands placed on girls by puberty and maturation.[27] Unable to meet the demands of physical and sexual maturity, girls starve themselves, thereby negating the threatening sexual characteristics (menstruation, which ceases) and regaining an immature, uncurved body.

Hilde Bruch, Department of Psychiatry, Baylor College of Medicine, Houston, has also proposed a psychological theory for the condition. Anorexics and their "relentless pursuit of thinness," says Bruch, are characterized by three main factors: a distortion of body image, misperception of such sensations as hunger and fatigue, and an underlying sense of personal ineffectiveness.[26] (p. 251-4) According to Bruch, anorexia and other eating disorders arise when parents neglect or respond inappropriately to a child's needs. When parental care, such as feeding, is constantly superimposed according to the mother's concept of what the child needs, the child may grow up with a deficient sense of independence and self-awareness, unable to clearly distinguish such basic drives as hunger and satiety. The child's sense of self-value and competence are blunted. Bruch postulates that the child, as a consequence of this constant external control, may come to experience his or her body image in a distorted way.[28]

This matter of anorexia and body image, incidentally, is controversial. Studies in which anorexics were asked to estimate their body sizes have shown that anorexics have a tendency to overestimate their body dimensions. Other studies have found this overestimation to be no more pronounced in anorexics than in control subjects.[29] There have even been suggestions to drop body im-

age misperception from the diagnostic criteria.[30] There is little disagreement that anorexics deny their emaciation, but the exact nature and significance of body image misperception appear to remain unresolved.

In any event, Bruch views anorexia as a misguided compulsion for autonomy and self-control.[28] This compulsion seems to be a central feature of the condition. In one study of female anorexics, 88 percent of the patients said they lost weight because they "liked the feeling of willpower and self-control."[31]

As Bruch indicates, family dynamics plays a major role in the development of anorexia.[28] Others have also examined the role of the family. One of the major proponents of a "family systems" approach to anorexia is Salvador Minuchin, Philadelphia Child Guidance Clinic.

Minuchin has proposed a model for families in which psychosomatic illness, specifically anorexia, seems most likely to occur. These families tend to exhibit "enmeshment," where the family members are overinvolved with one another. "Overprotectiveness" is another feature, where children and parents are highly protective of each other. Minuchin also identified "rigidity," a compulsion to maintain appearances, and "conflict avoidance," a tendency to avoid overt resolution of conflicts. There also may be a high emphasis placed on food and bodily functions.[32] In such a family, the child's autonomy is stifled, and the child fails to develop the skills to deal with others at his or her own age level. Anorexia becomes a means by which to manipulate the parents and perpetuate this overinvolvement with the family.

Such theories of anorexia within a family context are not without their critics, however. Joel Yager, a psychiatrist at School of Medicine, University of California, Los Angeles (UCLA), has pointed out that family models may rely on theories and measurements that are not entirely valid, and may depend on small samples and biased interview techniques.[33]

One intriguing possibility under investigation is that anorexia may be related to affective disorder—that heterogeneous group of illnesses generally lumped under the term "depression."[34] A number of studies have explored the incidence of affective disorder in relatives of anorexia patients. One study, by James I. Hudson and colleagues, Harvard Medical School, investigated the immediate families of patients with anorexia and bulimia. Hudson found that nearly one-quarter of the relatives exhibited signs of major affective disorder, a higher incidence of depression than in families of patients with schizophrenia or borderline personality disorder.[35] Other studies have also found that families of anorexics tend to exhibit a higher incidence of emotional disturbance than control groups.[33] Such results have not only led to the conclusion that there may be a link between affective disorder and anorexia, but have raised the possibility of a genetic predisposition to anorexia.

One study, by Dennis P. Cantwell and colleagues, Neuropsychiatric Institute, UCLA, examined 33 anorexic patients to determine the level of affective disorder among the patients themselves. Cantwell found that one-third of the patients were diagnosed as having affective disorder, and that nearly two-thirds manifested a dysphoric mood, including feelings of worthlessness, death wish, and suicidal ideation. Cantwell concluded that the data suggested "a hypothesis that at least some cases of anorexia nervosa may be a variant of affective disorder."[36] Another study, by Robert L. Hendren, Department of Psychiatry, George Washington University, supported these findings, determining that 56 percent of anorexic patients under study met standard diagnostic criteria for a major depressive disorder.[37]

Still another study, by Elke D. Eckert and colleagues, Department of Psychi-

atry, University of Minnesota, demonstrated that a higher level of depression in the female anorexic patients under study seemed to be associated with more severe anorexic behavior, such as vomiting, laxative abuse, and resistance to treatment. The study also found that patients who showed the greatest reduction in depression during treatment gained the most weight.[38] In addition to these studies, there is some evidence that antidepressant drugs may be effective in the treatment of anorexics. This link between depression and anorexia is controversial, and clearly requires further exploration.

In addition to exploring the psychological roots of anorexia, researchers have concerned themselves with the physiological causes of the disorder. Here there is some debate. Researchers disagree as to whether anorexia is precipitated by some primary dysfunction of the neuroendocrine system, or whether that dysfunction simply derives from the starvation and weight loss.

A good deal of the debate concerns the amenorrhea in anorexic females, one of the disorder's main features. Menstruation results from a series of hormonal secretions, which originate in the area of the brain known as the hypothalamus. The hypothalamus releases hormones to the pituitary gland, which in turn releases its own hormones to the ovary. Changes in the subsequent levels of ovarian hormones will induce the cyclical changes in the uterus that result in menstruation.

In anorexia, there is a disturbance in this hypothalamic-pituitary-gonadal axis, and menstruation ceases. Some researchers interpret the amenorrhea as evidence of a primary hypothalamic dysfunction in anorexia, while others view the cessation of menses as simply a consequence of the drastic weight loss.

Halmi has written in support of what she calls "indirect evidence" of a primary hypothalamic disturbance in anorexia. She has noted that emaciated anorexic females who've stopped menstruating show decreased levels of hormones called gonadotrophins. These hormones are crucial to the menstrual cycle, and their release from the pituitary is regulated by the hypothalamus. The low gonadotrophin levels in anorexic females do not rise in response to estrogen stimulus or drug treatments as they would in healthy subjects, even after weight gain.[39] In other words, the amenorrhea often continues, for weeks or months, even after normal body weight has been regained.

There are also findings that anorexic patients show an "immature" secretory pattern of a gonadotrophin called luteinizing hormone (LH). One study, by psychiatrist Mark Gold and colleagues, Fair Oaks Hospital, Summit, New Jersey, tested five adult female anorexic patients during their emaciated phase and again at least 60 days after weight gain. After all the patients had regained their ideal body weights, only one patient showed an adult pattern of 24-hour LH secretion, with the others displaying abnormally low LH levels more suggestive of immature, prepubertal subjects.[40]

Halmi also notes that amenorrhea may actually *precede* weight loss in as many as one-third of anorexic patients.[39] All this evidence may point to a defect in the hypothalamus that is not related to the patient's nutritional status. Halmi also claims anorexics may have a "vulnerable" hypothalamus that would predispose them to develop anorexic symptoms.[41]

Russell also believes that a primary hypothalamic disturbance may be behind the amenorrhea. Russell concludes that nonnutritional factors, such as psychological stress and other mechanisms not yet fully understood, contribute to the amenorrhea and the hypothalamic disorder.[42]

One body of opinion, then, holds that a hypothalamic disorder—perhaps an immature pattern of hypothalamic functioning—may be a cause of anorexia.

Other researchers have concluded that the hypothalamic dysfunction and amenorrhea in anorexia are consequences of the malnutrition, and are not necessarily primary features of the disorder. Robert S. Mecklenburg and colleagues, National Institute of Child Health and Human Development, Bethesda, examined hypothalamic dysfunction in anorexia. They noted that other victims of starvation, such as those seen during World War II, also displayed abnormalities in hypothalamic function, including amenorrhea.[43]

Robert A. Vigersky, an endocrinologist at the Walter Reed Army Medical Center, Washington, DC, compared 29 anorexic patients with 19 patients with simple weight loss and 20 normal controls. Vigersky concludes that the hypothalamic changes in anorexia are "secondary to the weight loss, *per se*."[44] In explaining how amenorrhea can precede weight loss, Vigersky points out that such factors as stress and excessive exercise might play a role, particularly since female dancers and athletes have been known to stop menstruating, even though their body weights were not abnormally low. There are also recent findings that normal women placed on markedly restrictive diets exhibit many of the hypothalamic-pituitary-ovarian changes seen in anorexia, including the immature pattern of 24-hour LH secretion.[14]

Two Australian psychiatrists, Peter J.V. Beumont and Janice Russell, University of Sydney, offer a further explanation for amenorrhea occurring before any weight loss. Careful evaluation of the patient's history, they say, will often show that months of erratic eating behavior has preceded—and no doubt helped cause—the amenorrhea. Such erratic eating behavior can continue even after weight has been regained, delaying the return of menses.[45]

The hypothalamus is also of interest to researchers because it controls such functions as appetite and satiety. In a review article on the neurophysiology of feeding, E.T. Rolls, Department of Experimental Psychology, Oxford University, noted that manipulation of the hypothalamus in laboratory animals has been shown to induce irregular feeding behavior.[46] Also, lesions and tumors of the hypothalamus in humans have been associated with behavior that closely resembles anorexia.[43]

Detlev Ploog, Max Planck Institute for Psychiatry, Munich, has postulated that the starvation in anorexia disrupts the neural activity between the brain and the gut. This results, he says, in a constant neural bombardment of the hypothalamus that may cause the anorexic patient to perceive the hunger as pleasant and rewarding.[47] Obviously, this will perpetuate the starvation and lead to a worsening of the illness.

There is, of course, more research being done on the biochemical and psychological aspects of anorexia. One study, for example, by Philip W. Gold and colleagues, Biological Psychiatry Branch, National Institute of Mental Health, Bethesda, studied secretions of a hormone called vasopressin. Vasopressin helps regulate the body's fluid balance, and its level usually rises in response to salt intake. Anorexic patients injected with a saline solution showed erratic, fluctuating vasopressin levels which seemed unresponsive to the saline injections. The defects seemed to be corrected after weight gain. It remains unclear whether the vasopressin defect is peculiar to anorexia or is a nonspecific result of the malnutrition.[48] Other research has dealt with irregularities in pituitary, thyroid, and adrenal functions.[49] But the precise biochemical mechanisms at work in anorexia remain a mystery.

The treatment of anorexia, too, is an area where opinions differ, although many of the methodologies share common features. Practitioners agree that hospitalization is imperative for the most chronic, severely malnourished cases. The immediate goal of treatment is to

restore the patient to a normal weight. As the patients are gaining weight, most treatment programs offer therapy to help overcome the morbid fear of obesity that is at the heart of the disorder. Bed rest and a daily caloric intake are usually enforced, with increased freedom and activities serving to reinforce weight gain.

There are differing opinions about the best kind of psychotherapy for anorexic patients. Bruch, for one, has argued against the use of traditional psychotherapy, in which the therapist imposes an interpretation on the private thoughts and emotions of the patient. Such therapy, according to Bruch, will only underscore the patient's sense of ineffectiveness, of being externally controlled.[26] (p. 336) She recommends an altered role for the therapist, in which the patient's thoughts and emotions are accepted supportively and uncritically.

Others share the view that traditional psychotherapy should be avoided. Hans H. Bassøe and Inge Eskeland, endocrinologists at the University of Bergen, Norway, reported a 58 percent success rate in a study of 133 patients. Their program purposely avoided any psychotherapy that would, as the authors state, have "penetrated the sensitive minds of the patients."[50] Instead, the patients received an explanation of the pathophysiology of hunger, and were thereby motivated to use their intelligence and willpower to increase their food intake.

Group therapy, in which anorexic patients can share their fears about weight gain and reinforce one another's progress, has also been used successfully. Often, recovered anorexics will serve as discussion leaders in such groups.[51]

Different treatment paradigms place different emphases on the patient's family. Some researchers agree with Gull's assertion 100 years ago that because the tension and conflict within the family have precipitated and aggravated the disorder, family members are "generally the worst attendants" for an anorexic patient.[3] (p. 47) Ian Story, a psychiatrist at the Austen Riggs Center, Stockbridge, Massachusetts, has stated that the physical separation of the patient from the family should be a vital feature of treatment, in the short and long run.[52]

For others, the family must play a key role in the rehabilitation of an anorexic. Crisp always attempts to engage the parents in the treatment program, and does so in 85 percent of the cases. The presence of the parents, according to Crisp, is essential in unraveling the conflicts which have given rise to anorexia.[53]

Minuchin,[21] Ronald Liebman, and colleagues, Philadelphia Child Guidance Clinic, have developed a treatment program that includes sessions in which the entire family gathers for lunch with a therapist in attendance. These sessions enable the patient to eat in the presence of the parents without the development of a power struggle, and also help to identify structural and dynamic factors within the family that have promoted and prolonged the disease.[54]

Drugs have been used in the treatment of anorexic patients, although there have not been many controlled studies on their effectiveness. Success has been reported with the tranquilizer chlorpromazine, which renders patients less fearful of weight gain.[55] Amitriptyline, a tricyclic antidepressant, has also been used with beneficial effects.[56] Studies with cyproheptadine, an antihistamine, showed that this drug helped anorexics gain weight and also alleviated some of their depressive symptoms.[57] Most of the value of drugs is adjunctive to nutritional rehabilitation and psychological counseling.

Treatment, whatever its form, takes time. Hospitalization or out-patient treatment may take months, with years of follow-up therapy. Unfortunately, not all anorexics fully recover.

One follow-up study, by Crisp, L.K.G. Hsu, and Britta Harding, St. George's Medical School, reports on the outcome of 100 female anorexic patients four to eight years after first presentation. Forty-eight of these patients showed a "good" outcome, with near-normal weight, regular menses, and satisfying social and psychosexual development. Thirty were "intermediate," and 20 were "poor." Two had died. Perhaps more significant was the finding that 49 percent retained the central symptom of a morbid concern about weight gain and becoming fat. Only 28 patients reported being unconcerned about their weight.[58]

Another British follow-up study, by psychiatrist H.G. Morgan, University of Bristol, and Russell, reports on 41 patients four years after discharge. Thirty-nine percent were defined as "good," 27 percent as "intermediate," and 29 percent as "poor." Five percent had died. The authors used the patients' backgrounds to determine factors which might aid in predicting outcome in anorexia. Among the negative predictors of outcome were a later age of initial onset, frequent hospitalization, and a history of disturbed relationships with parents and at school.[59] Another study reviewed data from 12 outcome surveys, and found that over half of the anorexic patients continued to have eating difficulties and almost half showed other signs of psychiatric impairments.[60] Minuchin and colleagues, on the other hand, reported that 86 percent of their patients had been cured of anorexia and related psychological problems.[32]

However, such follow-up studies on anorexics have attracted criticism. Hsu, in particular, has faulted outcome studies, citing a lack of diagnostic and methodological uniformity.[61] Other authors have echoed this charge, claiming that the evaluative criteria in such studies are often inadequately described or incomplete.[20]

But the follow-up studies do demonstrate the enormous difficulty in completely curing anorexic patients in the face of their tendency to maintain their symptoms and suffer relapses.

Scientific interest in anorexia nervosa is demonstrated by the existence of *ISI/BIOMED®* research front #82-1738, "Clinical studies and management of bulimia and anorexia nervosa." There are six core papers in this research front, all of which have been cited in this essay. These include publications by Bruch,[26] Hsu and colleagues,[58] and Morgan and Russell.[59] The other cited core documents, by Garfinkel and colleagues,[16] Casper and colleagues,[17] and Russell,[18] deal with the emergence of bulimia as a separate and distinct syndrome.

A number of journals publish papers on anorexia. *The International Journal of Eating Disorders*, a quarterly, is devoted entirely to the study of anorexia, bulimia, obesity, and related problems. Other journals, among them *Psychological Medicine*, *Psychosomatic Medicine*, and the *American Journal of Psychiatry*, also publish research on anorexia. All are covered in *Current Contents®/Social & Behavioral Sciences*, *CC®/Life Sciences*, and *CC/Clinical Practice*. As more research is published, and more results from various disciplines synthesized and unified, more will be understood about the psychological and biological causes of anorexia nervosa. Indeed, it is safe to predict that a complete understanding of its causes will have ramifications in many areas of medicine.

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