

The Etiology and Treatment of Anorexia Nervosa  
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## Introduction

Imagine making a new friend that you think will bring positive, healthy contributions to your life. As your friendship blossoms, they help you feel productive and motivate you to reach your goals. People begin to recognize these changes and commend you for your accomplishments. You and your friend become inseparable and you wouldn't have it any other way. But eventually, you begin to get the sense that they are not satisfied with your progress. Their demands become more and more daunting and their expectations seem to become increasingly unattainable. Spending time with them has taken a noticeable toll on your body. You live in constant fear of disappointing them and sometimes feel that you will never live up to their unrealistic standards. They pressure you to only spend time with them and to cut anyone that has expressed concerns about you out of your life. All of your efforts revolve around seeking their approval, but it seems like nothing you do is ever good enough for them. They constantly scrutinize you, which changes the way you view yourself. Your identity has become defined by your relationship with this person. As you become further and further out of touch with reality, you begin to develop paranoia and irrational afflictions. You live under their control and their rules. You feel empty and broken, but cannot escape because you would feel like nothing without them in your life. If what I have just described to you sounds like an abusive relationship, that's because it is. The identity of this "friend" is anorexia nervosa, or "Ana," the nickname that many anorexics give to their disorder. It is easy to denounce this sort of mistreatment when the blame can be placed on another individual. But when this devastating illness is manifested within you, anorexics experience the plight of constantly being at war with themselves.

*We're granted a moon to yank & anchor us,*

*a body & a purse*

*to carry & fill & empty*

*& transform into more objects.*

*There's a sheen inside each body*

*fluorescence on sealed cellophane*

*& a scrap airless as inside.*

*- Nina Puro*

The Mayo Clinic defines anorexia nervosa as "an eating disorder characterized by an abnormally low body weight, an intense fear of gaining weight and a distorted perception of weight." The disorder is "characterized by deliberate weight loss, induced and sustained by the patient" (World Health Organization). Anorexic individuals may engage in behaviors for weight

control such as food restriction, excessive exercise, self-induced vomiting, and use of laxatives or diuretics. “Today, 8 million Americans suffer from eating disorders and approximately 90 percent of them are young women” (Smink, 2012).

Individuals with anorexia nervosa may suffer medical complications, such as dangerously low blood pressure, infertility, severe osteoporosis, damage to the kidneys and liver, secondary endocrine and metabolic changes, disturbances of bodily function, and heart failure (World Health Organization). It is also common for anorexia nervosa to occur in conjunction with other mental health conditions such as mood and anxiety disorders, obsessive-compulsive disorder, and personality disorders as well as alcohol and substance abuse, self-injury, suicidal thoughts, and suicide attempts. It is estimated that “33-50% of anorexia patients have a comorbid mood disorder, such as depression,” and “about half of anorexic patients have comorbid anxiety disorders, including obsessive-compulsive disorder and social phobia” (Ulfvebrand 2015).

The etiology of anorexia nervosa can be attributed to biologic, social, cultural, and environmental factors. Anorexia nervosa has the highest mortality rate of all psychiatric disorders, and 1 of 5 people diagnosed will die (Daw, 2011).

The purpose of this research paper is to establish a thorough foundation for understanding the factors that contribute to the development of anorexia nervosa, provide insight into the contemporary implications of this disorder in the United States, bring light to the limitations that have hindered advancements in this field, acquire patient testimonies, explore the current approach to the treatment of eating disorders, propose a revised treatment model for future implementation, and highlight areas for future academic studies and research.

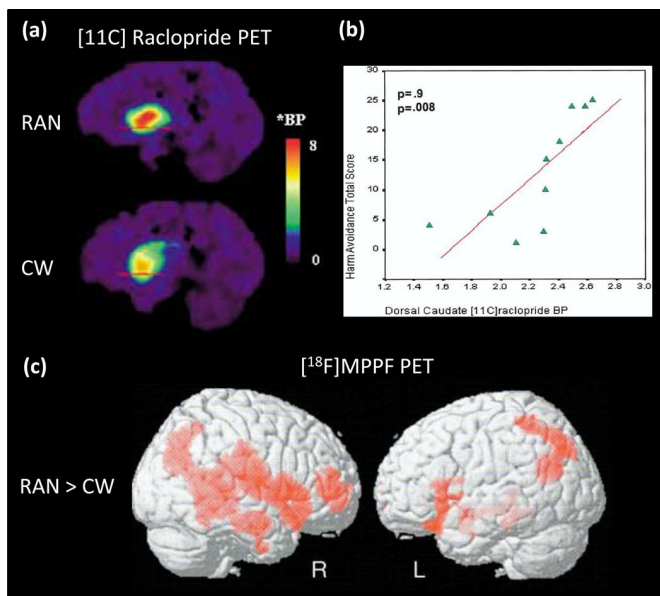
*“Then I’ll dream of horizons the blue of heaven controls,  
Of gardens, fountains weeping in alabaster bowls,  
Of kisses, of birds singing morning and eve,  
And of all that’s most childlike the Idyll has to give.  
The tumult at my window vainly raging grotesque  
Shall not cause me to lift my forehead from my desk;  
For I shall be absorbed in that exquisitely still  
Delight of evoking the Spring with my will,  
Of wresting a sun from my own heart and in calm  
Drawing from my burning thoughts an atmosphere of balm.”*  
- Charles Baudelaire

## Investigating the Complex Etiology of Anorexia Nervosa

### Part I: Biologic Factors: Genealogy and Neurobiology

The role of genealogy is critical in predicting one's susceptibility to developing an eating disorder. Familial and twin studies have revealed that individuals who have a first-degree relative with anorexia nervosa are 11 times more likely to develop the disorder than individuals without this hereditary link. Variations of serotonergic, dopaminergic, and opioidergic genes are involved with behaviors of body weight control, appetite regulation, and eating pathology. "Molecular genetics studies have been undertaken to identify alterations in deoxyribonucleic acid sequence and/or gene expression that may be involved in the pathogenesis of disordered eating behaviors, symptoms, and related disorders and to uncover potential genetic variants that may contribute to variability of treatment response" (Trace, 2013). Further analysis of these genealogical attributes concludes that while eating disorders aggregate in families, lineage alone only accounts for about 50% of one's liability to anorexia nervosa. The study indicates that complex social and environmental components also play a significant role in the etiology of eating disorders and suggests that future research delve further into such factors.

A look into the psychobiology of anorexia nervosa reveals that symptoms and behaviors of eating pathology are connected to brain chemistry. The interactions between hormones such as dopamine, serotonin, and cortisol are crucial to understanding altered brain function found within anorexic women. Positron emission tomography imagery has revealed that individuals with anorexia were found to have higher levels of dopamine production (Rigaud, 2007). Heightened levels of dopamine contribute to feelings of anxiety, and consequently, hyperactivity of brain functioning. Anorexic individuals were also found to have alterations in their serotonergic system, which affects hunger, impulse control, and mood; as well as increased levels of cortisol, which results in appetite suppression (Kane, 2013). Acknowledging these hormonal variations is imperative; as brain hyperactivity may account for one's preoccupation with weight, and food restriction may alleviate hormone-induced symptoms of anxiety.



This image uses Positron emission tomography to compare 5-HT<sub>1A</sub> and MPPF serotonin receptors and dopamine activity in the brain of a recovered anorexic woman (RAN) and an age-matched control woman (CW). [Source: Frank, G. K, *Biological Psychiatry*]

A 2015 study published in *Biological Psychiatry* investigated the correlation between hunger and response to food stimuli in 23 anorexic women and 17 healthy women in order to better understand cognitive control and decision making. The study incorporated a comparison between food and monetary reward and each participant's response to the stimuli. The results indicated that women diagnosed with anorexia nervosa may have altered brain function related to "peptides involved in energy balance, such as leptin, insulin, orexin, ghrelin, and peptide YY, which signals to reward processes, in the service of modulating feeding in response to changes in energy states" (Wierenga, 2015). Food stimuli served as an effective motivation and reward for the healthy women in the control group, however women within the anorexia group exhibited "decreased sensitivity to the motivational drive of hunger" (Wierenga, 2015).

The altered response to reward stimuli explored in this study also incorporates the role of emotional salience in the subjects. Individuals within the anorexia group, regardless of whether they were weight-restored or underweight, did not "show the expected association between ghrelin levels and blood oxygen level-dependent response to visual food cues" (Wierenga, 2015). As compared to the control group of healthy women, the anorexic women "failed to increase activation of reward valuation circuitry when hungry and showed elevated response in cognitive control circuitry independent of metabolic state" (Wierenga, 2015). Heightened inhibitory self-control contributes to the ability to delay reward, which plays a key role in persistent food restriction. Interestingly enough, appetite suppression was found to produce anxiety-reduction, whereas food consumption was found to "stimulate dysphoric mood" in anorexic women. This "disturbed interoceptive awareness of satiety or hunger" and "alteration of the gustatory processes" in anorexic women provides key insight for understanding the difference in response to hunger cues (Kane, 2013).

*"For I have known them all already, known them all—*

*Have known the evenings, mornings, afternoons,*

*I have measured out my life with coffee spoons;*

*I know the voices dying with a dying fall*

*Beneath the music from a farther room.*

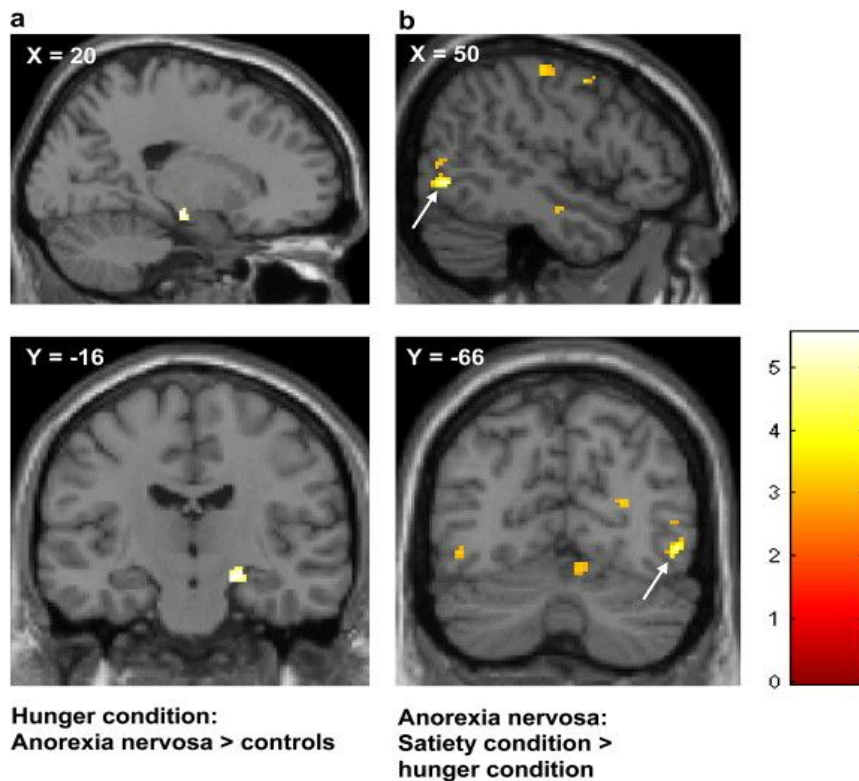
*So how should I presume?"*

*The Love Song of J. Alfred Prufrock: Stanza VIII, Lines 49-54.*

Functional magnetic resonance imaging allows for a deeper look into "the neural circuitry of gustatory sensory response, interoception, reward, and executive control" in anorexic women (Kane, 2013). Anorexia nervosa is a disorder highly associated with ascetic behaviors, especially in terms of weight and diet control, related to hyperactive executive function within the brain. In

a 2011 fMRI study, anorexic individuals were found to exhibit heightened response to stimulus cues, including “increased ventral striatal activity” when presented with perceived positive stimulus and “increased insula and posterior dorsal caudate” when presented with perceived negative stimulus as compared to non-anorexic individuals (Vocks, 2011). Such neurological findings have also been obtained in experiments involving subjects with extreme anxiety. These studies indicate that anorexic individuals manifest significantly altered cognition within regions vital to emotional salience, which ultimately “supports the idea that they might suffer from a fundamentally and physiologically altered sense of self” (Kane, 2013).

This apparent disparity in emotional salience and altered sense of self can help provide explanation for why those suffering from anorexia continue to restrict food despite emaciation, fail to recognize the negative health implications of disordered eating, and are reluctant to seek treatment. Without addressing the inherent pathophysiology responsible for behaviors that drive disordered eating, treatment for anorexia will continue to lack effectivity.



This image displays altered brain response in activations of the right amygdala (x = 20, y = -16, z = -11) and right inferior temporal gyrus (x = 50, y = -66, z = 0) in participants with anorexia nervosa as compared to the healthy controls when drinking chocolate milk in the hunger condition. [Source: Vocks, *Journal of Psychiatric Research*]

Individuals who develop eating disorders tend to exhibit specific personality traits, which serve as predisposing factors. These distinct characteristics include “anxiety, negative

emotionality, inflexibility, harm avoidance, and obsessive behaviors (particularly with order, exactness, and symmetry). Individuals with anorexia nervosa tend to be perfectionistic, with an overemphasis on self-imposed standards” (Kane, 2013). These individuals are often highly motivated and driven. They are the overachievers, straight-A students, determined athletes and exhibit high levels of self control and self discipline. They also have a profound dissatisfaction with their own self image and symptoms such as “a lack of insight about being ill” and “depriving themselves of food despite starvation” (Kane, 2013). The psychology of individuals with anorexia nervosa have long perplexed scientists, as this disorder would be the only circumstance in which someone suffering from emaciation would treat their condition with further food restriction.

*“Now my neighbor through the wall playing piano, I imagine, with her eyes closed.*

*When she stops playing, she disappears.*

*I am still waiting for the right words to explain myself to you.*

*When there was nothing left to smoke, I drew on my lips with a pen until they were black.*

*Or is this what it means to be empty: to make no sound?*

*I pressed my mouth to the wall until I'd made a small gray ring.*

*Or maybe emptiness is a form of listening.*

*Maybe I am just listening.”*

*- Allison Benis White*

## Part II: Social, Cultural, and Environmental Factors

The elective time for the onset of eating disorders is often seen during the span of puberty, associated with hormonal and body changes, or in the face of “increasing autonomy from parents” as seen in the completion of secondary school or transition into adulthood (Cayn, 2017). These disorders tend to develop amidst the presence of significant life stress, often when an individual is growing into their body or coming of age. Traumatic events such as sexual abuse, parents’ divorce, bullying, or other undiagnosed underlying mental disorders can serve as the trigger (Kong, 2009). In other words, there is some sort of kind of void in an individual’s life, leaving them extremely vulnerable. Because they are unable to take control in this situation, individuals with an eating disorder tend to cope with these issues by managing their diet and weight in order to reclaim their power.

*“The scale becomes your altar. It becomes the site where you pray every morning. You pray that it’ll be down another pound, or another ounce or anything. To show that the work that you’re doing, the work of starving is working because other things in your life aren’t working. It’s the one thing you have control over.”*

- Erika Goodman, former ballerina in the Joffrey Ballet

Anorexia nervosa is linked to an innate “struggle for control, a sense of identity, competence, and effectiveness” because “in the absence of adaptive personal control strategies, the individual may be driven to enact ritualistic body control as an auxiliary control mechanism (Froreich, 2016). Anorexic patients essentially fill their respective void by fixating on what society deems most important: one’s appearance. “Given that many women learn that their worth is equivalent to their appearance, another manifestation of this appearance-focus could be women’s decreased self-worth if they do not match up with societal ideals. (Tylka, 2010). “Cultural norms in the United States dictate the importance of being physically attractive, especially of being thin” and “a desire to be beautiful enough from the eyes of society by losing weight is something that many girls struggle with” (Martin, 2014). Women suffering from an eating disorder may inherently be seeking acceptance in desperate hopes that they will be valued and recognized for conforming to rigid social expectations.

However, when people take notice to the weight changes associated with eating pathology, they tend to overlook the dangers and glamorize the outcome of the disorder. Anorexia nervosa is often perceived as a “fashionable” or “trendy” illness. This social tendency may have been established in the 1980s when public knowledge about eating disorders soared. Eating disorders were “subject to unrelenting publicity through a deluge of articles in the popular press as well as television news specials and talk shows” (Hoek, 2008). As a consequence, the public began to directly associate eating disorders such as anorexia nervosa with stardom. Metaphors attached to anorexia seem to uphold the expressed values of cultural themes such as achievement, perfection, restraint, and self denial in a culture of plenty (Cooper, 2016).

Clinicians often find that patients take pride in their thinness and remarkably enough, it is common for family members to express “more approval than disapproval” in the symptomatic changes generated by the eating disorder through admiration for the patient’s self control or by using terms such as “slender,” “neat,” “well-groomed,” and “fashionable” to describe them (Hoek, 2008). Such glamorization is an extremely problematic factor in the perpetuation of eating disorders because as the sufferer receives positive social reinforcement, they are more hesitant to comply with measures necessary for a successful recovery, such as weight restoration, for fear of losing their newfound admiration.





A shoe advertisement featured in InStyle magazine, 2014.

*“With how sad steps, O Moon, thou climb'st the skies!*

*How silently, and with how wan a face!*

*What! May it be that even in heavenly place*

*That busy archer his sharp arrows tries?*

*Sure, if that long-with-love-acquainted eyes*

*Can judge of love, thou feel'st a lover's case:*

*I read it in thy looks; thy languished grace*

*To me, that feel the like, thy state describes.*

*Then, even of fellowship, O Moon, tell me,*

*Is constant love deemed there but want of wit?*

*Are beauties there as proud as here they be?*

*Do they above love to be loved, and yet*

*Those lovers scorn whom that love doth possess?*

*Do they call 'virtue' there— ungratefulness?”*

*- Sir Philip Sidney*

The media often comes under fire when seeking to place institutional blame on the prevalence of eating disorders. Thirty years ago, when eating disorders were first being recognized as a legitimate psychiatric concern, it was believed that the ideal female body had become progressively thinner at the same time the average female body had become progressively heavier. (Herman, 1983). Many researchers argued that the mainstream media promoted unrealistic beauty standards, thus contributing to the incidence of eating disorders among women in the United States. In a 2000 interview with PBS, Ruth Striegel-Moore, a

widely referenced psychologist with research expertise in eating and weight disorders, explains that society is involved in “the perfection game” in which we are repeatedly exposed to and ultimately internalize unrealistic standards of beauty in a celebrity culture where the bodies of models and actresses are considerably thinner than they have ever been in the past.

Thus, in sociocultural theory, the development of eating disorders can be linked to the constant pressure for individuals to conform to the unrealistic internalized beauty standards in order to feel validated and accepted. Researchers have been investigating the consequences that such media exposure has on one’s self-image for decades. When individuals do not measure up to the aesthetic ideals, body image concerns are subsequently evoked. These “internalizing symptoms may correlate with body dissatisfaction due to the sense of inadequacy experienced by adolescents with negative body image” (Marengo, 2018).

*“Dissatisfaction and envy constitute important ingredients in the business of selling transformation. Progress is an ideal basic to the American dream, an ideal exploited by those engaged in marketing by transforming the work ethic from work site to body and from the pursuit of virtue to the pursuit of beauty as commodity fetishism. Being ‘self made’ has given way to being ‘made over’”*

- *Mark Nichter, Medical Anthropology and the World System*

The weight loss and diet industry has mastered the art of exploiting these perceived inadequacies and insecurities for profit. The current Marketdata Enterprises report reveals that this industry now accounts for \$66 billion per year in the United States, up 10% from 2010. Farcical advertisements dominate billboards, magazines, radio and television commercials, and social media endorsements with “cure-all” products promising to get you “bikini-body ready,” give you “quick and easy weight loss,” or “remove inches from your hips.” While many Americans have become immune to the saturation of these advertisements, with companies such as Weight Watchers and Nutrisystem monopolizing the marketing industry every January, this normalization of diet culture prompts widespread preoccupation with body weight and size.

Dieting when not overweight is often the first symptom of an eating disorder, with “35% of participants progressing to pathological dieting or full-syndrome eating disorders” (Haltom, 2018). In a 2017 study, approximately two-thirds of adolescent girls reported that their mother dieted or frequently discussed weight (Balantekin, 2017). Growing up in an environment where adults are fixated on weight or constantly trying to change their bodies can ultimately shape a child’s perception and relationship with their own body. The presence of maternal dieting is a strong predictor of the development of eating pathology, which yielded “greater use of unhealthy and extreme weight control behaviors in the girls” (Balantekin, 2017). Alarming statistics reveal that “42% of 1st-3rd grade girls want to be thinner, 81% of 10-year-old girls are afraid of being fat, 46% of 9 to 11 year olds are often on diets, and 35-57% of adolescent girls engage in crash dieting, fasting, taking diet pills or laxatives, and self-induced vomiting” (Haltom, 2018).



Magazine covers promoting diet and weight loss culture

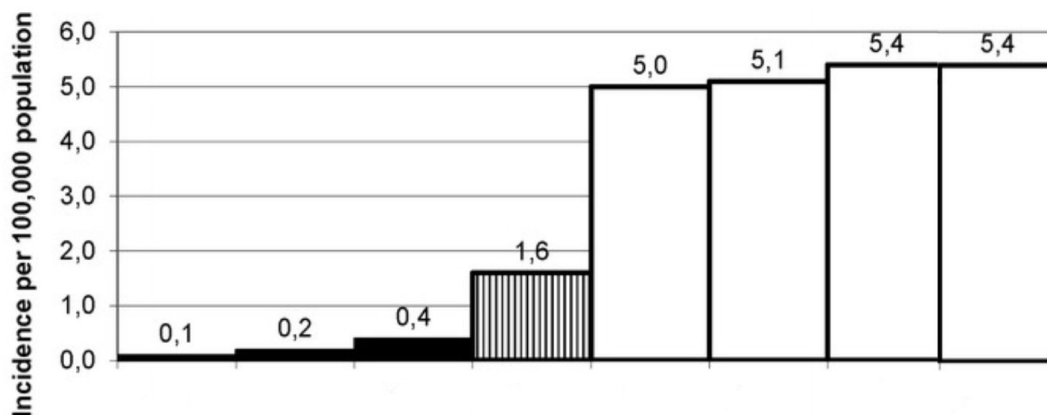
Since the dawn of the digital age, social media has evolved into an integral aspect of the daily lives of millions and has the potential to affect adolescent perceptions and self-esteem. Because this remains a relatively new phenomena, limited research is available into the relationship between social media and eating disorders. A June 2018 study on the impact of social media use examined the popular photo-sharing apps Facebook, Instagram, and Snapchat in order to assess their influence on body image. The study found that users participated in peer appearance-related feedback and as a result, also engaged in subconscious body comparison. The study ultimately found that social media use “impacted body dissatisfaction through social–cognitive processes of social comparison and body surveillance,” and thus “indirectly increased body dissatisfaction and disordered eating behaviors in young women” (Saunders, 2018). These links remained robust across all three platforms and remain consistent with the sociocultural model of disordered eating.

*"The milk they fed you on long  
soured, but you give  
it anyway. Your given name  
blackberry bramble, your given name  
queen of sorrow. We are all  
so thirsty in the village  
of what we once wanted. Don't  
you know where to hang  
god's eye, blueeyes? Don't  
you know language is useless? That  
I stitched the blanket I wrapped  
the wreck in? Don't  
you know goodbye lasted  
a decade? Goodbye  
each room's still flooded  
to the chandeliers. Goodbye  
fish swam slow circles between  
the chair rungs. Goodbye  
they know a language we don't. I can't  
name the marled color of the fishes'  
eyes or how they match the crystal  
goblets broken there but  
always full now, or how the glasses  
match the warm cups that suck  
the poison from your back"*

*- Nina Puro*

## An Alternative Perspective: The Changing Climate Surrounding Female Beauty Standards

At the beginning of my research journey, I had the preconceived notion that the development of eating disorders was on the rise among young women in the United States and that sociocultural factors were directly to blame. There is a lot of misinformation surrounding this topic, accompanied by misleading and outdated statistics. Authors are still relying on information from the 1970s and 1980s, and I found it extremely challenging to find eating disorder studies conducted within the past 10 years. Activists tend to look at the obvious factor, which is that the public is constantly exposed to unrealistic standards of beauty and that women are expected to live up to them. They perpetuate this narrative that women become anorexic because of the pressure to look like the size zero supermodels in magazines. With such logical fallacies, wouldn't this indicate that all women who desire to be beautiful must be underweight? Results from the 2017 National Health and Nutrition Examination Survey indicate that only 1.4% of U.S. women are underweight (CDC). The overall incidence of anorexia nervosa in the United States has remained stable in past decades (Smink, 2012).



This graph portrays the reported incidence of anorexia nervosa in the United States over the past 9 decades, beginning in 1930. [Source: Smink]

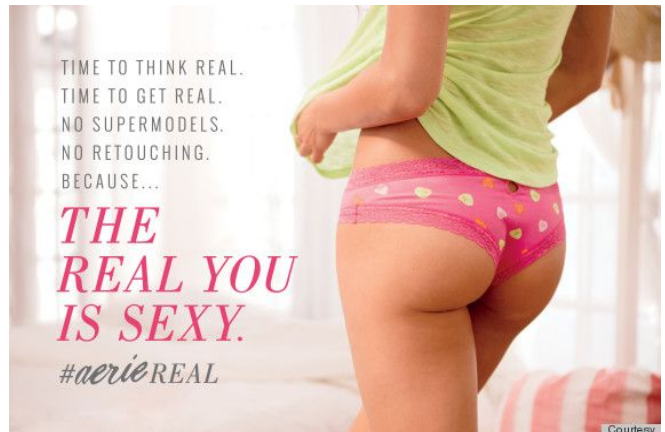
The basis of my perspective has shifted more to the counterargument over the course of my research journey. Given that hereditary accounts for at least 50% of one's susceptibility to developing an eating disorder, the distinct link to comorbid mental disorders, the role of neurobiology, and the correlation with specific personality traits; the etiology of anorexia nervosa appears to be largely biologic. Researchers in this field have not advanced beyond the era of Karen Carpenter and Princess Diana of Wales in studying the trends of eating disorders. Contributing factors and diagnostic criteria remain largely subjective. The failure to standardize information and develop a concise medical approach to eating disorders could very well be the reason why treatment options remain exceedingly limited in comparison to other psychiatric disorders. Knowledge of the biological science behind eating disorders is critical, and further research into the complex neurobiology has the potential to provide the foundation for the

development of medicinal therapy. New insights and updated studies in this field are imperative for comprehensive understanding and advancements moving forward.

*“Then I’ll dream of horizons the blue of heaven controls,  
Of gardens, fountains weeping in alabaster bowls,  
Of kisses, of birds singing morning and eve,  
And of all that’s most childlike the Idyll has to give.  
The tumult at my window vainly raging grotesque  
Shall not cause me to lift my forehead from my desk;  
For I shall be absorbed in that exquisitely still  
Delight of evoking the Spring with my will,  
Of wresting a sun from my own heart and in calm  
Drawing from my burning thoughts an atmosphere of balm.”*

- Charles Baudelaire

The climate surrounding female beauty standards in the United States has evolved dramatically in the past decade. Many companies have responded to the increasing size of the average American woman by tailoring to the diversity of body size through marketing campaigns, a phenomenon unheard of even twenty years ago. Brands such as American Eagle and Dove have launched movements promoting body positivity and acceptance by vowing to not photoshop their models. Plus-size clothing lines have become available at stores such as Forever 21 and Nordstrom. By allowing women of all shapes and sizes to have representation in these industries, this progressive approach is essentially redefining the landscape of beauty ideals in the media. Such movements could serve a promising future in promoting body positivity and inclusion, thus lessening the pressure on women to be thin in order to be considered beautiful.

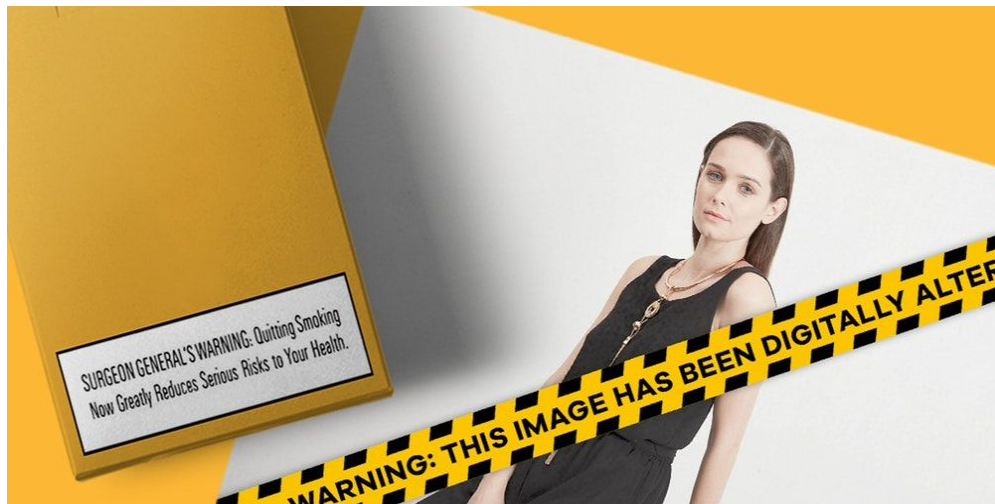


Advertisements featured in American Eagle’s “Aerie Real” and Dove’s “Real Beauty” campaign.

The plus-size modeling industry has become increasingly prevalent in the United States over the past decade. There has even been a steady incline in the representation of plus-size models in the high fashion realm, with the number of these models featured on the runway during New York Fashion Week growing each year. In 2015, model Robyn Lawley, size 12, became the first plus-size model to be featured in an editorial for *Sports Illustrated* magazine (Clayton, 2017).

In May of 2017, France’s Ministry of Social Affairs and Health passed new regulations to combat eating disorders and prevent further “promotion of beauty ideals that are inaccessible.” Minister Marisol Touraine released a statement saying, “Exposing young people to normative and unrealistic images of bodies leads to a sense of self-deprecation and poor self-esteem that can impact health-related behavior.” The new law mandates all models working in the European Union and the European Economic Area undergo a medical examination attesting “their general

physical well-being” and that their BMI does not denote them as excessively underweight. It also requires that publishers disclose “photographie retouchée” (similar to the Surgeon General’s Warning in the USA) on any image in which the model’s appearance has been manipulated, retouched, or photoshopped. It also imposes fines of up to 75,000 euros and six months of jail-time for employers who do not comply with these regulations. Similar regulations have been proposed for the United States, and activists in support of such principles have launched online campaigns, gaining thousands of supporters.



Example of a photoshop disclosure. Source: Pixelz Blog

*“Shall I part my hair behind? Do I dare to eat a peach?  
I shall wear white flannel trousers, and walk upon the beach.  
I have heard the mermaids singing, each to each.  
I do not think that they will sing to me.”*

*T. S. Eliot*

### **The Dental Implications of Eating Disorders**

Because I am pursuing a career in dental hygiene, I hope to apply my knowledge in the field of eating disorders to better treat patients with these conditions and educate other dental professionals based on these findings.

There are many intraoral conditions that can be linked to disordered eating, most notably, dental erosion. Because the mouth is often considered a window into the overall health of a



patient, a dental hygienist can play a pivotal role in identifying clinical signs of an eating disorder in an undiagnosed patient. By asking non threatening questions about dietary habits, at-home oral hygiene care combined with the assessment of common medical side effects found in patients with eating disorders such as decreased heart rate, temperature, and blood pressure; a dental hygienist can better evaluate the patient's wellbeing. Clinicians should be able to recognize signs of eating disorders, be aware of the treatment options available for eating disorders in the community, and be equipped with referral resources.

In a study of 71 female patients with an eating disorder that engaged in purging behaviors, 86% of the subjects exhibited dental erosion (Otsu). A dental hygienist can recommend ways to reduce the effects of frequent vomiting, as exposing teeth to acids results in structural loss. Such methods include the incorporation of high fluoride toothpaste and mouth rinse into the patient's daily routine, application of topical fluoride at each appointment, and more frequent recare intervals. The hygienist can also educate the patient on effective brushing techniques and methods to remove acid from interproximal spaces. Given this opportunity, they could also inform the patient of harmful effects of frequent vomiting to the tooth structure, which could serve as motivation to cut back on self-induced purging.

Individuals with eating disorders often express more dental fear. A dental hygienist can make the patient feel more comfortable through effective communication techniques. By taking the extra time to explain the rationale for each procedure and inform the patient of what is occurring throughout the appointment, the dental hygienist can help alleviate the stress of patient uncertainty. Because patients with eating disorders often suffer from other psychological illnesses such as anxiety and depression, they are often hesitant to schedule and attend regular dental appointments. They may also neglect at-home oral hygiene practice due to lack of motivation or guidance. The dental hygienist can work to make the appointments flow as smoothly as possible by providing the patient with peace of mind and a sense of security in reassuring them that they are safe and doing a positive thing for their health and wellbeing. In reducing patient fear, a dental hygienist can nurture a more positive relationship between an eating disordered individual and their health care provider by encouraging them to develop better habits for their overall health and wellbeing.

*“Hearts with one purpose alone  
Through summer and winter seem  
Enchanted to a stone  
To trouble the living stream.  
The horse that comes from the road,*

*The rider, the birds that range  
From cloud to tumbling cloud,  
Minute by minute they change;  
A shadow of cloud on the stream  
Changes minute by minute;  
A horse-hoof slides on the brim,  
And a horse splashes within it;  
The long-legged moor-hens dive,  
And hens to moor-cocks call;  
Minute to minute they live;  
The stone's in the midst of all."*

*W. B. Yeats*

### **Patient Case Studies**

I reached out to various individuals in the community for interviews to explore the personal experiences of those diagnosed with eating disorders as well as gather feedback and suggestions for developing an ideal treatment model. I felt that I needed to gather such information first-hand to create a unique approach. My focus was on four young women in New York City in the summer of 2018. I established contact with these patients in my dental clinic, at the residential treatment facility I visited, and by networking with individuals who have friends and family members with eating disorders. The true names and details regarding these patients have been disguised to protect their privacy and confidentiality of medical information.

#### **Patient I.**

Bella is a 20 year old woman that has been diagnosed with anorexia. When asked when she developed the eating disorder, she describes that her family taught her to cut food into very small pieces, chew slowly and to take her time eating, drink water in between bites to fill stomach up faster. She admits that she has been counting calories since she was 12 years old. She began noticing how skinny the other girls she played sports with were when she was in middle school, and as an early bloomer, she felt like an outcast. She thinks back to a health class in

middle school where it all clicked: the day she learned about the Nutrition Facts label and calorie counting. Since that day, she has maintained an extensive journal, logging everything she eats every day along with the “macros” for each item.

Bella has also been diagnosed with manic depressive disorder, known more commonly as bipolar disorder. She explains that her anorexia stems from her desire to maintain control, and that managing her diet and weight allows her to be in charge of her life. Bella describes that she often experiences urges to eat food that she deems “off-limits” and caves in in the moment, only to punish herself by purging and self harming afterward. “I just feel worthless and out of control whenever that happens. Looking back on those times...that’s how I know I have a problem,” she says. She says that her eating disorder and manic depressive disorder make it next-to impossible to be in any healthy relationship. Bella explains that whenever her her past boyfriends have expressed concern for her weight or strange eating habits, she has automatically become defensive. She says, “Anyone who expresses any concern just seems to become the enemy. My initial response is to defend my disorder. Maintaining an eating disorder is more than just a diet. It’s an all-consuming ordeal, almost like a full time job. Except I never take a day off.”

She is currently undergoing treatment at a residential eating disorder facility, as mandated by her parents.

#### Patient II.

Phoebe is a 15 year old girl that was diagnosed with anorexia nervosa when she was 10 years old. In the past year, her weight has changed drastically from 100 pounds down to just 65 pounds. She remembers being obsessive about her weight for the majority of her life, weighing herself up to a dozen times per day. She would decide whether or not each day would be a good day based entirely upon the number on the scale. When asked if she directly correlated her self worth with her weight, she answered ‘yes’ without hesitation. Phoebe says that her father forced her to go to counseling after she lost a third of her body weight. However, she admits to not being honest with the psychiatrists because she does not want to undergo treatment. She also says her father is constantly pressuring her to eat “normal” food and gets upset when she refuses.

Phoebe maintains social media accounts dedicated to her eating disorders. She describes how she follows “thinspiration” pages and ultra-thin models or celebrities to keep her motivated on days where she struggles to maintain her drive to consume as few calories as possible. She also admits to picking up on habits such as smoking cigarettes to suppress her appetite and taking laxatives on days where she feels she has eaten too much. She explains that being thin is constantly on her mind, describing her disorder as giving her “tunnel vision.” She says that in the end, she is aware of the damage she is doing to her body, but anything is better than gaining weight and being fat so she is easily able to overlook the consequences.

She has no plans to seek treatment at the moment and dismisses the adverse consequences of her disorder. However, she admits to feeling guilty for the worry that she causes her mother.

#### Patient III.

Alexis is a 24 year old nurse and identical twin that has recently been diagnosed with anorexia. She explains the internal sense of competition she has always felt with her twin sister. Alexis admits that she feels like her sister has her life together more than she does and that people like her twin sister more than they like her. Her sister currently weighs about 15 pounds more than her, and Alexis confesses that her biggest fear is being “fatter” than her sister. Alexis describes that the first thing she notices about any woman when she first meets them is how fat or thin they are. She always has the desire to be the thinnest woman in the room, because she directly associates being thin with being beautiful.

Alexis also struggles with anxiety, notably social anxiety. She explains that having anorexia nervosa makes it difficult to do things that normal 20-year olds do. “In college, everyone thought I was really weird because I didn’t eat at the dining hall and I didn’t drink alcohol because I didn’t want the extra calories,” she says. Alexis distanced herself from her closest friends in order to keep her diet and exercise regimen a secret. She admits to having almost a compulsion with knowing exactly how many calories she’s taking in, and that she they hates going to restaurants because she becomes fixated on the fact that it’s impossible for her to know how the food was prepared. She says, “I just sit there wondering if they cooked the food in oil or butter and how many calories that would add. Or if I order a drink I’m always paranoid that the waiter might have given me regular soda instead of the diet that I ordered. Anything cooked is a risk, so if I go to a restaurant I have to stick with salad or something raw, because that’s the only thing that’s safe.”

She currently attends regular counselling sessions with a psychiatrist and goes to weekly support group meetings.

#### Patient IV.

Sydney is a 30 year old single mother that admits to joining the military for weight control purposes. She says, “I’ve had an eating disorder my entire life, and I think once the time came for me to live on my own, I didn’t trust myself. I needed some sort of structure, or external accountability to maintain what I considered a healthy lifestyle.” However, once she left the air force, she no longer committed to the vigorous exercise regimen and began to gain a little bit of weight. During her most restrictive dieting, she limited her calories to under 200 per day, which is 10 percent of the recommended daily caloric intake for the normal, healthy adult. She suffers from both anorexia and bulimia nervosa.

She remembers first being concerned about her weight when she was as young as 6 years old. Her classmates in elementary school often teased her for being “pudgy” and she describes in detail an incident in which her mother took her to the doctor as a child for strep throat, and he told her mother that she needed to lose weight. Since that day, she has always been self-conscious and concerned about her weight. She admits to using diuretics to lose weight, and has been hospitalized multiple times in the past as a result.

Sydney has recently admitted herself into an eating disorder treatment center, for fear that her unhealthy relationship with food will rub off on her daughter.

*“We sat grown quiet at the name of love;  
We saw the last embers of daylight die,  
And in the trembling blue-green of the sky  
A moon, worn as if it had been a shell  
Washed by time’s waters as they rose and fell  
About the stars and broke in days and years.  
I had a thought for no one’s but your ears:  
That you were beautiful, and that I strove  
To love you in the old high way of love;  
That it had all seemed happy, and yet we’d grown  
As weary-hearted as that hollow moon”*

*- Carl Sandburg*

### **The Current Residential Eating Disorder Treatment Facility**

Treatment centers for eating disorders were a rare commodity in the United States prior to the last decade. An ideal system for treating anorexia nervosa would be from a multidisciplinary approach. Patients with anorexia nervosa have more than just physical symptoms of illness from being underweight. They also struggle with emotional and psychological problems. The treatment of eating disorders must include the collaboration of specialists such as psychotherapists, physicians, nurses, family counselors, and nutritionists in order to be effective. Even so, nearly 50% of all individuals with an eating disorder will relapse following their treatment in a facility (Couturier, 2012).

To look into the options for the treatment of eating disorder, I decided to investigate the practices within a residential eating disorder treatment facility. Because I personally know a current resident, I was able to get a tour and speak with some of the patients and employees. I discovered that patients in such facilities are typically severely underweight and have usually been mandatorily admitted by a medical professional or concerned loved one. These treatment centers are staffed with full-time professionals such as nutritionists, chefs, psychiatrists, 24/7 nurses, and body image specialists. Patients are put on a strict schedule and must be accounted for at all times. They are required to eat 3 supervised meals a day in addition to nutritional supplements with the rest of the admitted patients. They must attend group therapy sessions as well as individual meetings with their psychiatrist and recovery coach. There are strict rules in place at the facility, such as no discussion about weight, calories, diet, or exercise.

Nurses are responsible for conducting daily weigh-ins on a scale that does not display the number and for taking the patient's vitals, as individuals with eating disorders are likely to suffer medical complications with potential to affect the cardiovascular, neurologic, endocrine, metabolic, dermatologic, reproductive, gastrointestinal, hematologic, pulmonary, and ophthalmic systems of the body. Patty, one of the live-in nurses, informed me that many of the residents have been previously hospitalized or faced with the severe, life-threatening consequences of their eating disorder. She explained that patients are often reluctant to comply with the policies of facility because they are still clinging to the impulses of their disorder. "The first week or so is always the hardest for them to adapt to. A lot of them are still in denial that they even have a problem" she said.

On the afternoon that I visited the facility, I was able to eat lunch with the residents. During meals, patients are not allowed to bring any bags or jackets into the dining room and are not given a napkin, to prevent them from hiding food. They are encouraged to use the restroom beforehand, as no one is permitted to leave the table once the food is served. The residents are not informed of what they will be eating ahead of time, and many become preoccupied wondering what they will have to eat. The full-time staff sit with the patients in order to supervise, provide support, and enforce the rules. However, the staff are not required to eat with the patients.

The chefs served grilled cheese sandwiches made with white bread and American cheese, tomato soup presumably out of a can, and to the dismay of many of the residents, tater tots. All beverages served at meals must be caloric, the typical lunch drink being milk. Many of the patients engaged in behaviors of avoidance when it came to eating their lunches, such as examining their food, picking, chewing very slowly, or rambling to put off the task at hand. Despite their attempts, I am informed that these patients are merely delaying the inevitable, as they must conform to the 30-minute time limit they have to finish their meal and are not allowed to leave the table until their plate and glass are empty. If they refuse to finish their meal, they are required to be tube fed. The patients are strictly monitored post-meal as well, to ensure that they do not engage in purging behaviors.

I spoke with a the residents during lunch-time about how they felt, and many expressed discontent surrounding the food served at the facility. They wished there were healthier options available or that they had more choice in what they ate. The facility attempts to serve “normal” meals that the patients will be exposed to once they complete their treatment at the facility in hopes that they will be acclimated to the social aspects of food culture, such as not being overly picky, as it is unrealistic to be able to constantly dictate what you are eating.

I have many concerns regarding the eating disorder treatment facility I visited. I picked up on the lack of trust or bond between the patients and staff right away. The staff appeared to be more concerned with enforcing protocol than with patient wellbeing. Behind closed doors, the residents harbor multiple conspiracy theories. For starters, since the staff members often do not eat meals with the residents, the patients believe that the food they are being served must be intentionally prepared to be even more “fattening,” with the chefs adding extra butter, creams, oils, and sugars to sneak in extra calories. And since the staff are clearly not the ones there to gain weight, they don’t eat it. While this sounds like classic paranoia to me, I believe that the residents do bring up a good point. Because the patients are members of a community of individuals diagnosed with eating disorders, they appear to feed off of each other's habits, but not literally. By having the staff eat meals with the patients, the staff are in more of a position to be role models and give the patients the sense that they are there to support them in every aspect of their recovery. This promotes the patients to develop trust and a bond with the perceived enforcers who, at the end of the day, are really just there to help them get better.

I also believe it would be helpful for the facility to serve healthier food to reduce patient anxiety. New patients are just thrown into an entirely new environment and set up to have a breakdown. When you present them with food that they have built up all of these delusions around for years of their lives, it is really unrealistic to expect them to eat it. To them, it’s almost like a punishment. This approach only continues to make food the enemy. If the only effective way to get patients to eat is the looming threat of being tube fed, this is extremely problematic. Patients with eating disorders need time to be able to adjust to eating the foods that they have a phobia of and need support, not threats, in order to ultimately break down their afflictions.

Based on my research, I have come to the conclusion that successful recovery from an eating disorder cannot be measured by a single benchmark. I was curious as to how exactly the staff determine when a patient is ready to leave the facility, so I spoke with the specialists on site: the patients’ eating disorder recovery coach and their physician. The recovery coach described how each of the patient’s caregivers in the facility chart developments in their individual case throughout treatment. Before a patient is allowed to leave the facility, all of the specialists come together for a meeting and must agree that the individual has made sufficient progress and is prepared to live life outside of medical supervision. “We have to make sure they are healthy enough and that we are not setting them up to relapse once they walk out those doors,” she says. I asked what exactly “healthy enough” meant and to help answer my question, the physician pulled out a laminated copy of the BMI scale from a drawer in the examination

room. He explained that the range for a healthy body mass index is between 18.5 and 25 and that while the goals set for individual patients varies on a case by case basis, the facility strives to have each patient up to around a 19.5 BMI by the time they complete their treatment. He informs me that, “Getting the patients to successfully return to a healthy weight significantly reduces the risk of medical complications once they leave the facility.”

This approach struck me as rather problematic, given that BMI and a number on the scale do not necessarily indicate overall health status and certainly do not determine successful recovery from an eating disorder; especially in this scenario in which many patients are resistant to gaining weight throughout their time at the facility. Weight is always subject to change once a patient is no longer under the careful supervision of the staff, and if a patient’s weight is the only thing that has changed in the recovery process, it will likely change again post-treatment. Because each patient's weight is kept a secret from them during their time at the facility, they have essentially aided in making that number even more taboo. It almost initiates a forbidden fruit effect in the sense that by hiding it from the patients, it makes them fixate on it even more. Inherently, the first thing an individual with a history of an eating disorder that knows they have gained weight will be inclined to do once returning home is step on the scale. Given that many patients base their self worth on that number alone, this scenario is essentially a recipe for disaster.

While the physician may have oversimplified the weight-oriented approach to benchmarks in recovery for my understanding, his approach aligns with many experts in the field because the immediate medical priority is often to help a severely underweight individual gain weight to avert further adverse complications. Timothy Walsh, founder of the Eating Disorders Research Unit at New York State Psychiatric Institute emphasizes this approach in a 2017 article for the *International Journal of Eating Disorders* titled, “The Need for Consistent Outcome Measures in Eating Disorder Treatment Programs: A Proposal for the Field.” Walsh writes, “There is ample evidence that the lower the weight, the greater the risk of death and medical complication” (Attia, 2017). His approach, which has become protocol in many facilities for treating eating disorders, uses an individual’s weight alone as an index of how their recovery from anorexia is progressing. This approach is problematic, because anorexic patients have possessed a phobia of gaining weight throughout the entire course of their illness. If the way to recovery is to give in to the one thing that they fear the most, they are inevitably going to resist treatment. This could be a contributing factor that gives eating disorders the reputation of the one of the most difficult psychiatric illnesses disorders to treat.

Statistically, nearly half of all eating disorder patients relapse within the first year of recovery. I believe it is important to keep in mind that many of the patients were admitted to this facility because their disorders spun dangerously out of control in the real world. While a patient may appear to have made progress in the facility that they have become accustomed to for months or even years, this feat does not guarantee their success in the real world that they have



been sheltered from. Once they leave the bubble of the facility, they must inevitably face the struggles, realities, and triggers of life that drove them to disordered eating in the first place. If they do not know how to confront these stresses outside of the facility, their habits may resurface and they are at an even greater risk of reverting back to their disorder.

Because eating disorders fall into the broader realm of psychiatric conditions rather than just physical illness, a more complex approach is needed in order to ensure that an individual is truly capable of functioning outside of the sheltered bubble that they have existed in throughout the course of their treatment. They must be prepared to confront struggles in the real world and master coping mechanisms to help them manage difficult situations.

*“One day when I was depressed, the wind came to tell me that he  
also down  
As in fairytales, more than once I have wished he would take me  
on his wings to another land  
I would like him to cheer me up like colored balloons at children’s parties.”  
Juan Carlos Galeano*

### **Proposal: A Revised Treatment Model for Anorexia Nervosa**

I believe that a successful multidisciplinary program would heal the mind, body, and spirit of an anorexic individual to promote recovery maintained throughout a lifetime. While I do agree that a residential facility is necessary for severe cases, the foundation of these treatment centers is in desperate need of a makeover. It is important for patients to feel that they have a say in the care they receive to ensure that they do not lose their independence. Experts in the field agree that the goal of life after treatment is that patients should be able to live a healthy life, free from disorder, and be able to function in the world without being thrown into relapse. I have designed a revision to the current model of practice within the residential eating disorder treatment facility based on the research I have conducted and my interviews with anorexic patients that would satisfy the physical, emotional, and spiritual needs of patients.

The residential treatment facility would require a team of experts, including a nutritionist, psychiatrist, nurses, a recovery coach, physician, activity coordinator, trainer, chef, and body image specialist. Patients would still have daily vital checks and weigh-ins, but these numbers would not be hidden from them. It is important for the patient’s recovery to be a two-way street and for them to be fully present and aware of every aspect along the way. Patients would meet individually with their psychiatrist and recovery coach every day to ensure that their emotional needs are satisfied throughout recovery.

Family counselling sessions would also be encouraged, as eating disorders often strain interpersonal relationships. It is important for family members to understand the extent of what

the patient is going through so that they can be empathetic and know how to provide appropriate support. Residents need to be assured that they will be welcomed back with open arms once they complete their treatment at the facility. Patients would be encouraged to invite friends and family members to the facility to ensure that they do not lose touch with their lives outside of the treatment center. The visitors would be allowed to attend meals and participate in activities with the patients.

The facility would host daily group counselling sessions with all of the residents to establish a sense of community and support system. These meetings would allow residents to vote on daily activities or meal options and also provide the opportunity for guest speakers. Former patients would be invited back for community meetings to speak to their experience, provide advice for the current patients, and update them on how they are maintaining their progress outside of the facility. The treatment center would also implement a mentoring program for former patients to advocate for current patients in their recovery journey.

The activity coordinator would help arrange daily group events for the patients, such as art therapy, book groups, volunteering opportunities, exercise classes, excursions outside of the facility, and events in conjunction with body image repair. Daily activities are important for the patients, as they can serve as positive distraction from the internal struggles they are experiencing during recovery at the facility. Patients would also be encouraged to keep a personal journal as an outlet for their thoughts and to help keep track of their progress in their personal recovery journeys. The trainer would offer various fitness and recreational classes to reinvent the patients' perception of exercise. Exercise should not be prohibited, as seen in existing treatment models, because it offers therapeutic benefits and is necessary for the patients in repairing their relationships with their bodies.

The conventional approach to exercise during recovery from eating disorders places restrictions on time and intensity in attempt to prevent the patient from burning too many calories. Many residential eating disorder treatment facilities ban exercise altogether and experts argue that physical activity alters hormonal secretion and energy expenditure, which can impede weight restoration. Given that eating disorders are often characterized by excessive exercising as a mechanism for weight control, there are currently no existing treatment models that advocate for frequent or vigorous exercise during recovery. While exercise can result in weight loss, it also increases the release of ghrelin, an appetite stimulator, and decreases levels of leptin, which slows the metabolism. This process becomes exasperated when an individual is underweight or not taking in enough calories, but activities such as weight lifting can actually increase body weight and mass. Therefore, certain forms of exercise can fit into the treatment model for eating disorders, so long as the patient is replenishing the amount of calories that are burned.

Incorporating some forms of exercise into the treatment plan for eating disorder recovery can help repair a patient's relationship with their body as well as boost their self esteem and confidence. During weight restoration, anorexic patients struggle to love and accept their changing bodies because of their loyalty to the thin ideal and absolute fear of becoming too

heavy. Exercise can build both physical and mental strength for patients by serving as an outlet for repressed emotions and a healthy coping mechanism for the life stresses that they will inevitably have to confront in their lives after treatment.

My treatment model would encourage patients to start with light exercise such as yoga, walking, skating, or tai chi and work their way up to moderate exercise such as weight lifting, rock climbing, and team sports. This treatment plan would implement nutritional supplements to replenish calories and prevent adverse effects to a patient's weight and metabolism. Although vigorous cardiovascular exercise yields numerous health benefits by increasing bone density, boosting immune system, and reducing the impact of mood disorders; the caloric expenditure and risk for further weight reduction is ultimately too great to fit into a treatment plan for significantly underweight patients. Exercise limitations have also proven beneficial in patients that fuel their eating disorder by over exercising, as these individuals have become so dependent on this behavior to make themselves feel that they are in control. Deviating from intense exercise allows these patients the setting to distance themselves from their disorder and confront the subsequent psychological effects of abandoning their regimented routine that they would previously never dare go without.

The facility would encourage patients to continue their spiritual and religious practices throughout their treatment. Patients would be allowed to leave the facility to attend their respective worship sessions, and the facility would accommodate and incorporate a patient's religious or spiritual needs appropriately throughout a patient's time in treatment.

As for the approach to meals, patients would have the opportunity to prepare meals together to serve as a bonding experience with the intent of reinventing their relationship with food. The nutritionist would ensure that each meal fulfills the caloric requirements for the individual needs of the patients. A more wholesome approach to food is necessary. Rather than just serving stereotypical foods for weight gain such as pizza and hamburgers, meals should promote body recovery while also offering nutritional benefits. Foods such as granola, cheese, peanut butter, whole grain pasta, protein-rich meats, beans, milk products, and eggs can be incorporated into a healthy diet and also provide calories for weight gain. If the meals fall short or the patient cannot finish their food, a nutritional supplement would be offered to ensure that the patient is consuming enough calories while also receiving the vitamins and protein they need. The treatment facility would also offer opportunities for the patients to eat at restaurants, with the intent of gradually acclimating the patients to the social aspects of food culture.

In terms of nutrition rehabilitation, experts often approach food solely as a mechanism for weight restoration, thus the more food the better and the more caloric the better. Weight restoration alone is deemed the single most important factor for eating disorder recovery in current literature and treatment models often equate it with recovery, overlooking underlying emotional and psychological factors. Forced weight restoration has proven problematic in anorexic patients that harbor a phobia of gaining weight and confronting their "fear foods." By nature, eating disorders manufacture unhealthy and problematic relationships with food that can

follow patients for the rest of their lives. Although weight restoration is vital for a patient's overall health in recovering from an eating disorder, it is equally important to address a patient's overall perception and understanding of the role of food in their lives. Health care providers should maintain the rhetoric that food is necessary to nourish patients' bodies and provide them with nutrients and energy so that they lead a healthy life.

Patients suffering from eating disorders are notorious for limiting their dietary intake and counting calories to control their weight. The anorexic women in my case studies admitted to being preoccupied with food and partaking in behaviors such as banning entire food groups from their diet and memorizing nutrition facts labels. Individuals with eating disorders are very aware of what they are eating and have harmful preconceived notions and habits surrounding the climate of food. Thus, meal plans for eating disorder recovery must be carefully constructed. While standard nutrition stresses the importance of eating foods such as leafy greens and lean protein, anorexic patients may require a different approach to meet their unique needs. My treatment model would slowly reintroduce "fear foods" into a patient's diet, while combining them with familiar foods that they are already comfortable with and have become accustomed to eating.

In combination with nutritional counseling, the ideal treatment model would allow patients to make choices and have a voice in their dietary needs. Rather than banning low calorie foods, as seen in the standard treatment approach, patients would be allowed to eat them as long as they fit into a balanced meal that fulfills a patient's individual caloric needs. As patients adjust to eating more caloric meals and are progressing with their weight restoration, my treatment model would allow for the patients to have more independence in order to ensure that they feel they are in control of their recovery and are capable of managing their own nutritional needs outside of the treatment facility.

These revisions to the current treatment model for eating disorders may have the potential to yield higher success rates in recovery and prevent the incidence of relapse.

### **Sample Meal, Exercise, and Dental Hygiene Plan**

*This regimen was developed in collaboration with Alexis.*

Morning Exercise: Stretching and 60-minute Tai chi group class

Breakfast

- ❖ Bagel with choice of peanut butter or cream cheese
- ❖ Choice of fruit
- ❖ Hard boiled egg
- ❖ Yogurt
- ❖ Glass of dairy, soy, coconut, or rice milk

### Snack

- ❖ Nutritional “bliss balls”(dates, walnuts, protein powder, honey almond butter, and coconut flakes prepared in a food processor)
- ❖ Carrot sticks with hummus dip

### Lunch

- ❖ Whole wheat pasta with alfredo sauce, spinach, mushrooms, and grilled chicken
- ❖ Side of kale salad: nuts, seeds, cranberries, orange segments, and crumbled feta

### Snack

- ❖ Assorted fruit smoothie with protein powder and chia seeds

### Dinner

- ❖ Baked salmon
- ❖ Sweet potato
- ❖ Choice of rice, couscous, or quinoa

Evening Exercise: 45-minute group kickboxing class

### Dental Hygiene Instructions

Please brush gently using the Modified Stillman technique (indicated for recession and sensitivity) as demonstrated with a soft-bristled toothbrush and high fluoride toothpaste for at least 2 minutes after each meal. At night, use the C-shaped flossing technique and floss picks for posterior areas and rinse with a high fluoride mouth rinse before bed.

*The growing good of the world is partly dependent on unhistoric acts;  
and that things are not so ill with you and me as they might have been is half owing to the number who  
lived faithfully a hidden life, and rest in unvisited tombs."*

*—George Eliot, Middlemarch*

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