

## Bridging Gaps: Inpatient Management of Extreme Anorexia Nervosa

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### ABSTRACT

Anorexia nervosa (AN) is a complex and deadly psychiatric disorder characterized by co-occurring psychiatric diseases and widespread physiological changes that affect every organ system. Given the high rate of mortality due to AN, there is a need for early recognition so that patients can be managed by an appropriate multidisciplinary team early in the course of the disorder. In this context, an interdisciplinary team encompasses a physician to provide medical care, a physician to provide psychiatric care and a registered dietitian or nutritionist to provide nutritional support. Extreme AN (defined as body mass index (BMI) < 15 kg/m<sup>2</sup>) has been associated with higher rates of mortality when compared to patients with AN who have higher BMIs (> 15 kg/m<sup>2</sup>). Unfortunately, it is not uncommon for hospitals to lack the necessary means to appropriately treat these extreme patients, as is evidenced by the presented case. This case involves a 20-year-old patient diagnosed with extreme AN (BMI 10 kg/m<sup>2</sup>) restrictive type that presented for medical instability. The admitting institution lacked a prepared multidisciplinary team, including inpatient psychiatry and eating disorder (ED) specialists. As a result, this patient's care was delayed during the most crucial time of her diagnosis. This case serves to detail the complexity in the management of extreme AN as well as highlight the importance of an institution having a prepared multidisciplinary team that is capable of handling cases of extreme EDs.

**Keywords:** Anorexia nervosa; Mental Disorders; Body mass index; Physician; Psychiatrist; Nutritionist

## INTRODUCTION

Anorexia nervosa (AN) is a severe and potentially life-threatening eating disorder (ED) characterized by a distorted perception of one's body weight and shape, leading to severe restriction of food intake and often excessive exercise<sup>1,2</sup>. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) outlines specific criteria for diagnosing AN, which include: a) restriction of energy intake leading to significantly low body weight; b) an intense fear of gaining weight or becoming fat, even when underweight; c) a distorted body image, leading to a self-perception that is unduly influenced by weight and shape<sup>1,2</sup>. The degree of AN severity may also be organized by body mass index (BMI): mild (BMI  $\geq 17$  kg/m<sup>2</sup>), moderate (BMI 16 to 16.9 kg/m<sup>2</sup>), severe (BMI 15 to 15.9 kg/m<sup>2</sup>), and extreme (BMI  $< 15$  kg/m<sup>2</sup>)<sup>2</sup>. There are two main subtypes: the restricting type, which involves primarily restricting food intake, and the binge-eating/purging type, which includes episodes of binge eating or purging behaviors like vomiting or laxative use<sup>2</sup>. Using DSM-5 criteria, the lifetime prevalence of AN in females is estimated to be as high as 4%<sup>3</sup>. In 2010, an eight-year longitudinal study followed a group of 496 adolescent girls from ages 12 to 20 and found that 5.2% of the girls met DSM-5 criteria for AN, bulimia, or binge eating disorder<sup>4</sup>. Unfortunately, no studies have estimated the prevalence of extreme AN based-on BMI categories (i.e., how common is it for an individual to have a BMI of 10 kg/m<sup>2</sup>, as with our patient). However, studies that have looked at this population have concluded it generally requires a chronicity of several years for patients to get down to an extreme BMI and remain functional<sup>5</sup>.

It is well documented in the literature that young people between the ages of 15 and 24 with AN have ten times the risk of dying compared to their older counterparts<sup>3</sup>. Furthermore, studies have shown that lower BMIs correlate with more severe medical comorbidities<sup>6</sup>. Thus, these patients must receive proper care efficiently, as delays can lead to serious and deadly outcomes. Published recommendations for hospitalization of AN include severe bradycardia of less than 50 beats per minute (bpm) during the day or hypotension defined as less than 80/50 mmHg<sup>7</sup>. Other indications for hospitalization include electrolyte derangements, chest pain, shortness of breath, or syncopal events<sup>7</sup>. It is important to note that up to 73.3% of AN patients have psychiatric comorbidities, most commonly including depression and anxiety, that can often complicate progression throughout the treatment plan<sup>8</sup>. Additionally, the early treatment period is often the most dangerous for these patients as there is a significant risk of refeeding syndrome. Thus, a comprehensive treatment team is required to manage patients with AN who require hospitalization due to medical instability. Published recommendations suggest this team include a medicine physician, psychiatrist, nutritionist, and therapist<sup>11</sup>. Additionally, for more severe cases, a specialist in EDs is often needed to guide management.

## CASE PRESENTATION

A 20-year-old female presented to a tertiary care center from her university's student health services with a chief complaint of "abnormal labs." The patient reported she could no longer walk to class without becoming significantly short of breath. Upon further questioning, the patient reported she has been struggling with her relationship with food for the past year. She reports she has always been thinner due to her involvement in athletics. She described previously enjoying foods like burgers and fries, but over the past year, in combination with the new stress of starting graduate

school, these foods have been causing her pain and discomfort. As a result, she reported eating no more than small servings of fruits, pretzels, and granola bars, resulting in a 25lb weight loss over the past year. She denied intentional vomiting or any form of purging behavior. Upon psychiatric evaluation, the patient endorsed that she deals with stress and anxiety regularly. On physical examination, the patient was found to have a heart rate of 43 bpm (reports her heart rate is usually in the 30s-40s), blood pressure of 80/50 mmHg, and a BMI of 10 kg/m<sup>2</sup>. Initial comprehensive metabolic panel (CMP) abnormalities included sodium of 132, chloride of 93, blood urea nitrogen (BUN) of 32, aspartate aminotransferase (AST) of 87, alanine transaminase (ALT) of 129, and glucose of 63. Complete blood count (CBC) showed neither leukocytosis nor leukopenia. Thyroid stimulating hormone (TSH) was within normal limits.

The hospital's psychiatry consulting team was consulted and diagnosed the patient with extreme AN restrictive type. She was admitted to the medicine team with psychiatry and nutrition following. Initial hurdles included titrating nutritional intake, monitoring for refeeding syndrome, gaining the trust and "buy-in" of the patient, and determining the roles of psychiatry and medicine in her management. A nasogastric tube was placed for nutritional intake, and feeds were titrated slowly as oral intake was increased. No signs of refeeding syndrome occurred during her admission. (Figure 1) illustrates the patient's trend in potassium, magnesium, and phosphorus.

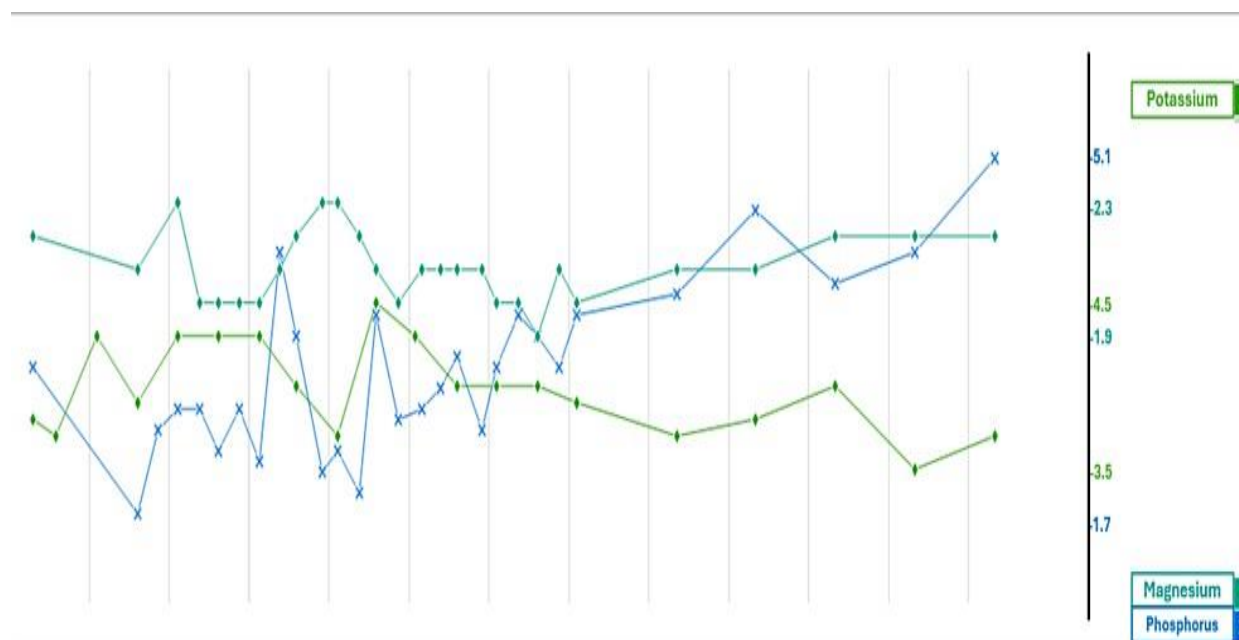


Figure 1. Trend in potassium, magnesium, and phosphorus.

Our team consulted an adolescent ED specialist located at another hospital within our system. He provided his protocol for dealing with patients with AN admitted for medical stabilization. This included methods for nutrition titration and ensuring daily weights and calories were tracked without the patient having direct knowledge of these metrics. The critical aspect of patient trust was ensured by transferring the patient to the resident team so that the same resident and medical student saw her throughout her admission. Three weeks into the admission, the patient had gained over 3.5 kilograms, labs and vitals had stabilized, and she was maintaining her goal caloric intake completely by mouth. The trends in weight gain and lab results are illustrated in (Figures 2, 3), respectively.

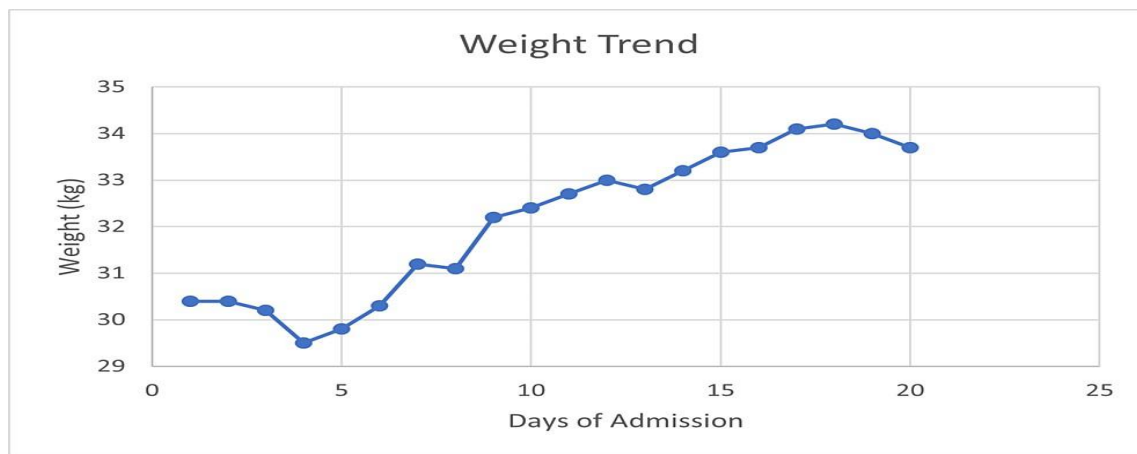


Figure 2. Weight trend during admission.

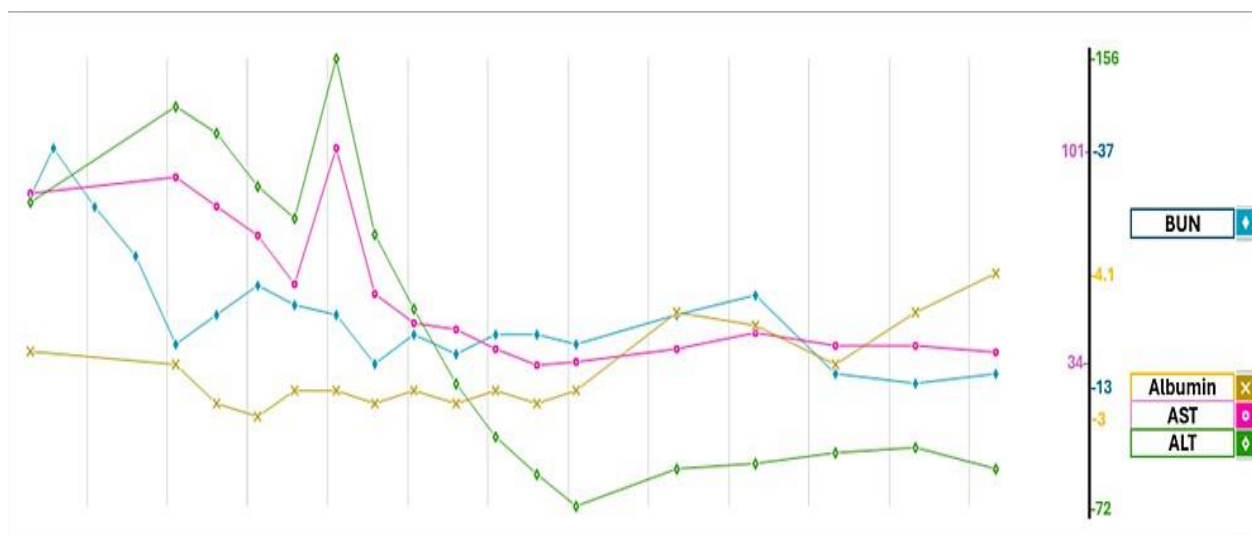


Figure 3. BUN, Albumin, AST, ALT trend.

BUN= blood urea nitrogen, AST= aspartate aminotransferase, ALT= alanine transaminase.

At this point the team began exploring post-hospitalization options for continued rehabilitation from this critically low BMI. Due to her BMI that was now 12 kg/m<sup>2</sup>, the patient was not a candidate for most facilities specializing in EDs as these facilities had a BMI “cut-off” of 15 kg/m<sup>2</sup>. She was ultimately discharged home and set to follow up with a specialized team, including a medical doctor, psychiatrist, therapist, and dietitian.

## DISCUSSION

This case describes a rare presentation of a 20-year-old female who, at such a young age, had acutely lowered her BMI to 10 kg/m<sup>2</sup> over a 12-month period. Acutely, a BMI < 12-13 kg/m<sup>2</sup> is typically fatal, as seen in famine or hunger strikes<sup>5</sup>. While the incidence of extreme AN in the general population is unknown, studies have shown that it usually takes several years for an individual to get their BMI down to extreme levels and remain functional<sup>5</sup>. To the best of our knowledge, this case is the first described in the literature of an extreme AN patient with a BMI of 10 kg/m<sup>2</sup>, and no other comorbidities, that occurred with such acuity (12 months)<sup>5,9-11</sup>.

As insurance reimbursement for inpatient hospital treatment for patients with EDs declined in the United States in the 1990s, new approaches like residential treatment emerged to meet the medical, nutritional, and mental health needs of this population<sup>12</sup>. Unfortunately, these residential care facilities often have a BMI requirement and focus on providing primarily psychological treatment, with a medical component, to medically stabilized patients. Conversely, inpatient hospitalization usually provides only short-term medical stabilization, often without ED-specific psychological treatment resources as was the case at our institution<sup>12</sup>. This dynamic puts the extreme AN patient in a precarious situation where they are deemed too medically unstable to receive specialized treatment from ED facilities and thus forced to remain hospitalized where they often are not receiving the specialized care they require, at a time when mortality rates for their condition are the highest<sup>3,13</sup>.

In our case, the inpatient psychiatry consult service did not have privileges to provide inpatient services and was thus limited to periodic consult visits and recommendations. Additionally, due to her critically low BMI, only a few facilities across the nation were willing to accept our patient. These facilities were associated with a significant financial burden and distance from family. Family was a crucial part of her support system, so this was deemed not an option. As a result, we were forced to improvise and devised a plan for her to be discharged home with close follow-up with a specialized outpatient team that included a medical doctor, psychiatrist, therapist, and dietitian.

## CONCLUSIONS

This case serves to not only detail the complexity in the management of a case of extreme AN, but also to highlight the dangerous gaps in care that extreme AN patients face as they are deemed too medically unstable to participate in

specialized ED programs and are thus required to remain in the hospital where they are often not receiving the specialized care they need in a time during their treatment where mortality rates are the highest. Therefore, it is essential for all hospitals to have a protocol and a prepared multidisciplinary team capable of handling these cases of extreme AN.

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