



Wards 5-6
Intensive Care Unit

Anorexia Nervosa

An intensive care unit admission & intubation



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In November 2021, the Salford Care Organisation (SCO) intensive care unit (ICU) were consulted for opinion of a potential planned admission for a deteriorating 17-year-old female. They resided within a secure eating disorder unit (SEDU) with diagnosed anorexia nervosa (AN) and obsessive-compulsive disorder (OCD). For confidentiality, they shall be referred to as Patient X throughout.

Patient X had been restricting oral intake, performing micro-exercises and self-harming, which resulted in poor nutritional and physical status. To mitigate this, Patient X was undergoing multiple nasogastric tube (NGT) insertions for bolus feeding per day. Physical restraint of up to six staff was required for NGT insertion, feed provision and preventing regurgitation. Initially the intervention appeared successful with physical and biochemical markers maintained. Despite restraint, Patient X developed an ability to purge feed, and their health deteriorated to a life-threatening stage.

Multiple interventions were tried. However, it was hypothesised that Patient X's body was so starved that they were unable to engage in mental health treatment. The SCO ICU team were approached for feasibility of, as a final option, sedating and intubating as a form of chemical restraint to facilitate NGT feeding. It was thought, if successful, this could allow for a period of nutritional repletion, whilst managing potential refeeding syndrome (RFS) risk, thus improving Patient X's health to an extent that they would be able to engage in mental health therapy.

Introduction

AN and OCD are complex, multifaceted conditions (**Table 1**).¹ AN is an eating disorder (ED) whereby restricted energy intake results in low body weight. Common characteristics include intense fear of weight gain, compensatory behaviours to avoid weight gain, body-image distortion and low self-esteem.² OCD is the UK's fourth most prevalent psychiatric illness and affects 1-3% of the population.³ National Institute for Health and Care Excellence (NICE) characterise OCD by recurrent, obsessional thoughts and/or compulsions that interfere with daily activities, causing functional impairment.⁴ 'Obsession' describes unwanted, intrusive urges which cause feelings of distress and anxiety, whilst 'compulsion' describes behaviours which temporally relieve the unpleasant feeling associated with the obsession.⁴ Food intake and body-image related obsessions and compulsions may present through dietary restriction, formulation of food rules or compensatory behaviours.

Assessing capacity within AN is challenging, contributing to legal and ethical dilemmas, as demonstrated within Northamptonshire Health Care NHS Foundation Trust and Patient A.⁵ Patient A was a

28-year-old female diagnosed with AN aged 13 and had received extensive inpatient treatment over 11 admissions. With a weight of 25.8 kg and hypokalaemia, her health had deteriorated to a life-threatening condition. The only viable treatment option was considered to be a six-month admission with forced NGT feeding requiring physical restraint and sedation, potentially twice daily. Both Patient A and their medical team did not see this as in Patient A's best interest due to high levels of distress and low chance of success. Patient A was deemed to have litigation capacity to partake in legal proceedings. Patient A provided a statement explaining she knew declining further treatment would result in death, but their desire to decline treatment was to prioritise quality time with loved ones. Patient A stated: "this decision was made by her, not her illness". The court determined Patient A lacked subject-matter capacity due to their deep-rooted AN associated beliefs as demonstrated by Patient A identifying reasons to live but being unable to identify the necessity of nutrition to life. The impact of this ruling could be considered an 'anorexia catch 22'; characterised that while a person diagnosed with AN may be able to demonstrate litigation capacity, they may forever lack the capacity to make informed decisions regarding ED related treatment.⁶

Table 1: AN & OCD definitions according to International Classification of Diseases 11th Revision¹

Anorexia nervosa	- Significantly low body weight for height, age and/or developmental stage not due to other health condition or lack of access to food - BMI <18.5 kg/m² in adults - BMI for age under 5th percentile in children and adolescents - Rapid weight loss (>20% body weight in six months) - Persistent pattern of restrictive eating or behaviours aimed at establishing or maintaining abnormally low body weight associated with an extreme fear of weight gain - Behaviours may include restricting energy intake, fasting, choosing low calorie foods, slow eating of small amounts of food, hiding/spitting food, purging behaviours (vomiting /laxative abuse/omission of insulin in diabetes) or behaviours that increase energy expenditure - Excessive preoccupation with body weight. Low body weight is highly valued and is core to persons self-evaluation.
Obsessive compulsive disorder	- Presence of persistent obsessions and/or compulsions - Obsessions are intrusive, unwanted and commonly associated with anxiety - Compulsions are performed to prevent perceived negative outcomes. These may be not clearly related to the obsession or not - Obsessions and compulsions must be time consuming (e.g. taking >1 hour/day) - Result in significant distress or significant impairment in personal, family, social, educational, occupational or other important areas of functioning - Symptoms and manifestations are not a manifestation of another medical condition - Patients may have good insight of their obsessions and compulsions or this may be absent.

CASE STUDY

Background

From November 2021 to January 2022, the SCO ICU multi-disciplinary team (MDT) prepared for Patient X's potential admission. Literature reviews were conducted to formulate an evidence-based plan; however, robust studies were lacking. Careful planning was required to ensure that if admission occurred out-of-hours all elements of care from sedation, intubation and nutrition could be performed safely. Interventions were guided by NICE⁷ and the Management of Really Sick Patients with Anorexia Nervosa (MARSIPAN) 2nd edition guidelines,⁸ the most up-to-date guidance at the time. MARSIPAN has since been replaced by the Royal College of Psychiatrists' Medical Emergencies in Eating Disorders Framework.⁹ Guidance advises when physical health is at serious risk and the child or young person lacks capacity to make the decision for themselves, nutrition can be given as a compulsory treatment if parental consent is obtained, or under legal framework: The Mental Health Act 1983/2007 or the Children Act 1989.^{2,7}

The proposed plan was an ICU admission lasting 3-7 days to allow a sustained period of nutrition, then a return to the SEDU. Intervention posed significant risk, including, but not limited to, death, organ failure, ventilation acquired pneumonia and post-traumatic-stress disorder. Due to the significance and rarity of the case, the parent and ICU team completed a court application to determine if such a drastic treatment was ethical and legal. In February 2022, the court ruled that with evidence of significant physical decompensation, the proposed treatment could take place for this "exquisitely difficult" case. Patient X, at this stage, was electively mute but the ruling found sufficient grounds that she would want to live and thus the treatment would be in her best interest.

Post court ruling, a period of stability was achieved until May 2022, where recurrent purging of feed resulted in clinical parameters deteriorating to a stage posing imminent risk to life (**Table 2**). A best interest meeting was called involving parents, the SEDU and SCO teams. Admission was deemed essential to life and Patient X was admitted.

Table 2: Worsening parameters of health which indicated appropriate timing for intervention

Parameter	Implication
Deranged electrolytes unable to be corrected by supplementation	Metabolic acidosis
Ongoing weight loss on an already malnourished body – although not possible to weigh, decreases in mid-upper arm circumference as a surrogate measure represented 10% decrease in body mass	Muscle atrophy Decline in body reserve Compromised immune function
Newly acquired ability to expel stomach contents despite means of restraint	No method of nutritional input
Severe constipation, bowels not opened for 2-3 weeks with unknown cause – laxatives and physical examinations declined	Potential for faecal impaction, overload diarrhoea or an underlying diagnosis – e.g. stricture, perforation, inflammatory bowel disease

Case presentation

Patient X was intubated on admission. Pre-admission planning aimed to avoid propofol as means of sedation due to its energy content, high risk of RFS and generally unknown tolerance. Intravenous ketamine and midazolam were used, however adequate sedation was unable to be achieved with ongoing signs of distress demonstrated. It was thought the long-term use of benzodiazepines in previous mental health management had developed a degree of tolerance to their use as sedation agents. Propofol was commenced and adequate sedation was achieved soon after.

At the SEDU, Patient X had two nutritional plans: one oral and one enteral, providing ~1600 kcal/day and ~4500 kcal/day respectively. The enteral plan had been in place prior to transfer to ICU, however, ~700 ml was purged after each bolus. It was unknown how much nutrition was absorbed. History showed that purging occurred after NGT feeding but not oral diet, which Patient X attributed to feed intolerance and was not the result of intentional purging. Weight on admission was 38.4 kg (**Figure 1**). A starting calorie target of 1600 kcal/day was set, approximately 40 kcal/kg, with daily feed increases planned.

Intervention

RFS was of significant concern, however, due to the limited 3–7-day treatment window, the priority was to optimise nutritional status. It was crucial to avoid underfeeding syndrome and lose precious time to treat Patient X, having ultimately put her through a potentially significant traumatic life-event.

Nutritional intake increased in 500 kcal/day increments to 4032 kcal and 169 g protein (**Figures 2-3**) over 7 days. Low grade temperatures on days 3-5 led to concern about potential ventilator acquired pneumonia. Due to the unusual nature of Patient X’s presentation and the aim to promote nutritional repletion within her admission, a MDT consensus decision was made to delay increments in nutritional intake during this time. No source of infection was found, so nutritional input increased on day 6.

Weight gain occurred daily, suspected to result from constipation. With laxatives, bowels opened on day 5 and became regular thereafter. It is suspected this accounted for the weight decrease from day 6 (**Figure 1**). Biochemistry during admission was unremarkable bar the increase in alanine aminotransferase (ALT) from day 6 (**Table 3**). MARSIPAN guidance states this is common in cases of severe AN and improves with nutritional repletion, therefore this did not delay nutritional increments.

Extubation was performed on day 8, however, due to hypoxia and laryngeal oedema, Patient X experienced a respiratory arrest and was re-intubated. After two days of dexamethasone, Patient X was successfully extubated. Weight had increased by 4.6 kg, with a body mass index (BMI) of 15.1 kg/m².

Table 3: Changes in biochemistry during admission

Parameter	Day of admission																	
	1	2	3	4	5	5	6	6	7	7	8	8	9	9	10	10	11	
	AM	AM	AM	AM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	
Sodium	125	129	129	136	139	141	141	140	137	136	139	141	143	141	140	139	139	
Potassium	3.4	3.6	3.4	3.2	4	4.1	4.7	4.3	4.2	3.8	3.5	3.8	4.4	4.2	4.2	4.3	4.2	
Creatinine	38	41	47	39	49	50	42	44	37	40	28	33	31	35	30	28	26	
Urea	4.3	3.8	3.4	3.1	3.4	3.6	3.3	3.4	3.4	4.5	4.2	4.2	4.3	4.4	5.5	5.1	5.3	
Bilirubin	9	9	9	10	14	9	15	13	14	11	7	5	4	2	<2	2	2	
ALT	10	11	10	17	15	14	71	201	244	261	209	163	164	106	95	83	75	
ALP	60	60	66	63	67	69	67	71	76	83	77	80	71	76	66	70	71	
Albumin	45	43	47	43	44	41	41	41	40	39	35	36	34	34	32	33	34	
Corrected calcium	2.34	2.28	2.34	2.54	2.39	2.23	2.31	2.29	2.24	2.23	2.19	2.14	2.2	2.28	2.28	2.27	2.31	
Magnesium	0.84	0.74	0.78	0.75	1.26	0.99	0.85	0.73	0.65	0.66	0.66	0.65	0.76	0.71	0.7	0.67	0.67	
Phosphate	1.32	1.23	1.13	0.82	1.76	1.61	1.69	1.25	1.02	1.06	0.6	0.96	0.92	1.03	1.12	1.17	1.49	
Haemoglobin	103	105	118	113	116	117	113	107	102	101	86	90	81	80	76	75	75	
White blood cell count	4	2.9	2.7	2.7	6	6	6.8	7.7	7.5	10	6.2	5.3	4.4	2.8	2.7	3	3.8	

Figure 1: Weight change from day 1 to 10 of admission

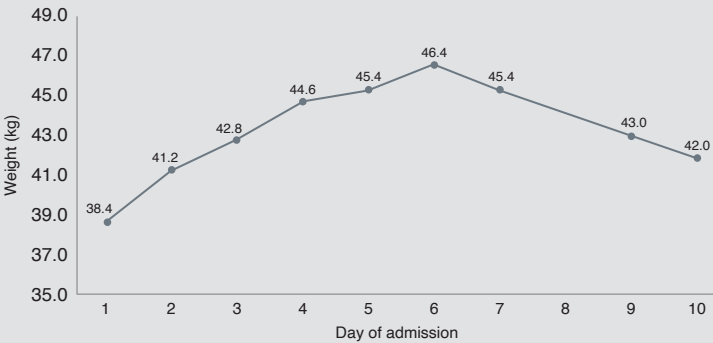


Figure 2: Energy intake (kcal) from day 1 to 8 of admission

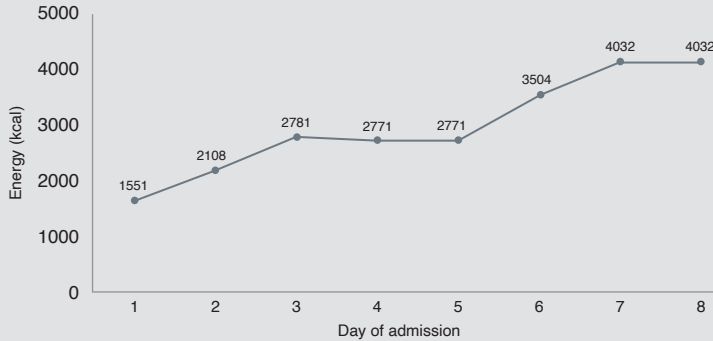
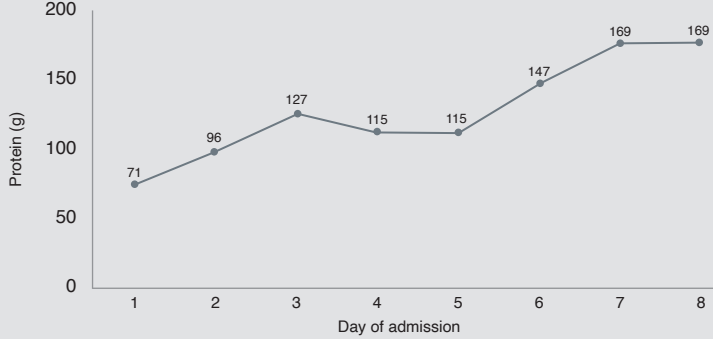


Figure 3: Protein intake (g) from day 1 to 8 of admission



“Food intake and body-image related obsessions and compulsions may present through dietary restriction, formulation of food rules or compensatory behaviours.”

Initially, the NGT remained in situ. On removal, a meal plan was devised based on the original SEDU plan. It was not possible to follow the original SEDU plan due to a difference in catering provision. A new oral meal plan was devised, where possible, matching meals and drinks to the original plan in terms of nutritional value, meal type (e.g. hot/cold) and hedonic preferences (**Table 4**). On day 11, Patient X was repatriated to the SEDU.

Post discharge

A debrief took place three weeks later. Patient X was following an oral meal plan and had only required one episode of NGT feeding since discharge. Patient X was eating in the communal areas and engaging in mental health treatment. Patient X reported to find the ICU admission extremely distressing and her engagement in treatment was reported to be a desire to avoid further ICU treatment rather than a desire to get better. Nonetheless, the SEDU team felt this a positive step in recovery and that death was likely had the admission not taken place.

Table 4: Oral meal plan

Day	Breakfast	Lunch	Evening meal
1	• 2 x wheat biscuit cereal with 200 mls soya milk • 2 toast with spread & jam • Fresh fruit juice • Drink of choice	• Vegetable cottage pie & mushy peas • 2 ice cream	• Vegan fajita • Chocolate mousse
2	• 2 Weetabix with 200 mls soya milk • 2 toast with spread & jam • Fresh fruit juice • Drink of choice	• Cheese sandwich • Jam sponge	• Cheese, onion, leek & potato bake • 2 ice cream

Discussion & summary

The lacking evidence-base to guide intervention was challenging. Through networking, authors learned of only one other similar SEDU to ICU admission, which was reported to be unsuccessful. Significant feed intolerances and limited change in mental health status post discharge meant this unit had declined any further admissions of intubating and ventilating for nutrition.

Due to the lack of evidence-base and significant risk of treatment, the SCO ICU MDT were concerned. It is unknown if there will be long-term complications of the intervention, but in the short-term it was felt the admission avoided death and allowed an opportunity to engage in treatment post discharge, which both the SEDU and ICU team considered a success. This was attributed to consistent communication and planning between all MDT members. The experience meant the SCO team would support a similar admission should it present in future, so long as the appropriate legal advice is sought.

Due to the rarity and case complexity, it is important to highlight and share the experience. To add to this, the case highlights the need to take clinical guidelines as what they are – guidance. If RFS guidelines were followed, end calorie intake would have been less than what was started at. The authors felt it is essential to share the case to help guide trusts that may find themselves in a similar situation. Its rarity highlights the need for more case studies to be published to facilitate learning about novel situations.

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