**Background:**

Anorexia Nervosa (AN) has the highest mortality rate of any psychiatric illness [1]. A key characteristic of AN is that patients are unwilling to eat enough to sustain or restore health due to fear of normal body weight. In some cases, patients require admission for medical stabilisation to medical wards or Specialist Eating Disorder Unit (SEDU) in line with existing risk frameworks [2,3]. On admission, most patients will reluctantly comply with nutritional treatment. However, between 13-44% of patients [4] object to treatments designed to restore physical health and or weight gain and are detained for involuntary treatment under the Mental Health Act (MHA) in England and Wales [5] or equivalent in Scotland [6] and Ireland [7]. Predictors of involuntary treatment include comorbidities of schizophrenia, autism spectrum condition, personality disorder as well as higher previous rates of admission [6]. Being legally detained is sufficient in most cases to compel a patient to eat with appropriate levels of support and supervision. However, some patients require Nasogastric Tube (NGT) feeding against their will. The incidence of this seems to peak between the age of 15 and 18 years [6]. Tan et al [8] found that patients who experienced involuntary feeding found it distressing, but at higher body weight they reflected that they were pleased that their decision to refuse treatment had been overridden and they were fed against their will.

There are numerous clinical guidelines that direct NGT feeding in eating disorders, yet none specifically discuss feeding under restraint. However, there is significant legal and ethical framework to inform the use of restraint in practice. The United Kingdom and Ireland have differing mental health laws governing when a patient is detained for treatment against their will. Nonetheless, there are overarching principles across the nations in regard to prioritising the least restrictive treatment option, providing treatments that are in the patient's best interest and those that maximise independence. In line with these principles dietetic practice has evolved within eating disorders specialist in-patient settings. Clinicians in mental health in-patient units and on general medical wards may also be required to facilitate involuntary NGT feeding that enables a patient to go on and receive appropriate treatment and therapy.

Whilst research around involuntary NGT feeding exists there is little published research into the practice of feeding under restraint including incidence, type, duration, measure of restraint or outcome. Most literature focuses on the lawful or ethical decision to feed using restraint. In one of the few publications, Clausen [9] characterises involuntary treatment episodes in AN in Denmark. They found that patients receiving involuntary NGT feeding averaged 70 involuntary episodes over a mean duration of 170 days, requiring the use of 286 episodes of physical restraint, and 67 episodes of chemical restraint. At present no such

studies exist in the UK. At present there is no published data about the outcome of feeding under restraint in terms of timescales for recovery or relapse.

Patients fed under restraint may require physical and or chemical restraint to maintain the safety of both the patient and staff while this clinical intervention is carried out. Mechanical restraints such as nasal bridle or nasal loop used to deter confused patients from pulling tubes are not used in AN, as if deliberately pulled out nasal injury will result and further delay feeding. Restraint can vary in degrees, but for the purposes of these guidelines we assume the type of restraint that is required when a patient is strongly and physically resisting NGT feeding. This restraint will typically require two to five members of staff trained in safe methods of restraint and safe delivery of NGT feeding. Any use of restraint, including NGT feeding under restraint, should always be a measure of last resort when best efforts to support oral nutrition fail with subsequent deterioration in physical health.

The aim of developing these guidelines is to assist clinicians to make informed decisions when managing patients who are both medically and psychiatrically compromised, and for whom this intervention may be out of the scope of their usual practice. This guidance will be relevant to dietitians working in several areas; adult medical wards, paediatric wards as well as general and specialist mental health facilities. There are incident reports from adult medical wards where the opportunity to feed patients under restraint has not been considered or agreed and is likely to have contributed to a patient's death [(10)]. It is hoped that these guidelines will raise awareness of the risks of underfeeding [1], as well as highlighting how to modify clinical practice to adhere to mental health law; informing local policy development accordingly.

## Methods:

The Delphi method is based on the principle that decisions from a group of individuals are more accurate than those from unstructured groups. Over different stages experts answer questions related to the topic in question. Therefore, a consensus is developed, reflecting the views of the previous rounds. It is thought that during this process the assortment of answers decrease, and the group will move towards the answer.

A modified Delphi method was used in developing these guidelines as it was felt that having a set of questions at the start of the process may limit the breadth of the guidelines. During stage 2 of the process additional areas for consideration were highlighted by members of the working group (stage 3) – which in turn were feedback to the whole group (Figure 1).

### Stages 1 to 3

The initial stakeholders were the primary authors from Fuller [11] as they had highlighted the need for these guidelines to be developed. Communications were sent out via the BDA's Mental Health Specialist Group as well as The British Eating Disorders Society for interested dietitians to contact the primary author. A working group of 16 dietitians was established. To ensure that there was good representation, the working group consisted of at least one dietitian responsible for adult and one for Child and Adolescent Mental Health Services (CAMHS) for each nation.

To develop the guidelines a modified Delphi method was used as described by Keller [12]. Based on the findings of the initial audit by Fuller [11], key areas showing inconsistency among clinicians were identified for comment i.e. bolus size, reducing the number of boluses given, speed and method of delivery (stage 1). The working group were asked to summarise their current practice in these areas so that the primary author could create an initial draft of the guidelines (stage 2) – a one-month timeframe was given. The working group were asked to reply via e-mail, telephone call or teleconference with the primary author. Responses were received from 15 of the 16 (94%) members. This highlighted further areas that required consideration such as medical monitoring, refeeding management and MDT considerations (stage 3). The working group were then asked to comment on draft guidelines created using their input. If a dietitian did not comment within this timeframe they were considered to be in full agreement with the current version.

### Literature review and appraisal (stage 4)

The literature search strategy focused on the process of how to feed under restraint once the decision to do so has been made by the eating disorders team. Therefore, the search

excluded studies that were legally or ethically focused around decision making or the use of restraint.

Following an initial scoping exercise, very few research publications were identified in the specific area of feeding under restraint with a diagnosis of AN. Therefore, the subsequent search strategy was developed to include all published materials within the broad area of feeding under physical restraint.

Combinations of the following search terms were used: Nasogastric feeding; Tube feeding; Enteral feeding; Supplementary feeding; Bolus feeding; Assisted feeding; Restraint; Involuntary feeding; Compulsory feeding; Treatment refusal; Restrictive practice; Physical restraint; Food refusal; Force feeding. All studies published up until June 2019 included in the search. In addition, reference lists of relevant articles were searched for any articles not returned by the initial search.

**Databases**

The databases searched were: MEDLINE, PubMed, CINAHL, Scopus, Cochrane and EMBASE. This was carried out at stage 4 of the Delphi process.

**Existing unpublished or specialist guidance**

The Royal College of Nursing, The Royal College of Psychiatry, and The British Dietetic Association were contacted for any existing guidance. Dietitians working in eating disorders were contacted in Canada, Australia and New Zealand to determine if any unpublished or specialist guidance existed for method of feeding under restraint within those countries. Current clinical guidelines including Royal College of Psychiatry UK MARSIPAN guidelines, National Institute Health and Care Excellence (NICE), Guidelines International Network (GIN), the Scottish Intercollegiate Guidelines Network (SIGN), Australia's National Health and Medical Research Council (NHMRC), the Academy of Nutrition and Dietetics and Canada's Practice-based Evidence in Nutrition (PEN), were consulted, but none considered feeding under restraint.

**Inclusion and exclusion criteria**

Articles were included if they were (i) written in English; (ii) quantitative, qualitative or mixed method research studies (iii) case studies, guidelines, and expert opinion (iv) studies including adults of any age or sex requiring NGT or feeding for nutrition or hydration (iv) studies including some NGT-fed patients among patients with any medical condition.

Articles were excluded if they were (i) non-human; (ii) non-English language; (iii) patients fed via other enteral routes

Database searches identified 284 records. Hand searching indexes identified a further three. Screening of titles and abstracts was conducted independently by two reviewers (UP, SF), with consensus reached through discussion on disagreements. Of the records screened 256 were excluded for: not addressing enteral nutrition specifically with restraint, addressing the relevant laws in non-UK countries, addressing NGT feeding only in neonates, the use of mechanical restraint to manage confused patients rather than food refusal or eating disorders.

Full-text screening of the remaining 28 articles was conducted by the first author, all of which were then checked by the second author. Following this initial sampling, no disagreements were identified. A further 24 studies were rejected at this stage because they focused on mechanical or chemical restraint within confused surgical or dementia populations only.

**Critical appraisal of selected studies**

Studies were appraised for quality and bias using a validated mixed methods quality assessment tool (MMAT) [13]. There are few published studies in the area of feeding under restraint in AN. Two studies, Fuller [11] and Neiderman [14] are a qualitative survey design. Clausen [9] is a quantitative analysis of retrospective data (N = 4,727), and the final paper is a consensus statement by the Department of Health [15].

The results of the literature appraisal and final comments from group members were synthesised into the final draft of the clinical guidelines which was agreed by the working group (stage 4).

**Stage 5 and 6**

Once the clinical guidelines were complete, they were sent to two patients and a carer for comments as well as three respected professionals within the field of Psychiatry. None of the comments necessitated an update to the guidelines at this stage (Stage 5). The guidelines were then submitted to both the BDA and INDI for endorsement and internal publication via their websites (Stage 6).

**Results of the literature review**

Of the 4 studies reviewed only one, Fuller [11], addressed the process of NGT feeding under restraint. Both Clausen [9] and Neiderman [14] characterise the population and the outcomes of patients undergoing NGT feeding under restraint, but neither discuss how patients were fed only referring to “pump assisted feeding” or “bolus feeding”. The Department of Health clinical guidance [15] does not discuss the method of feeding, simply referring to patients being fed.

Fuller [11] used a survey to audit the detail of how patients under restraint were fed. A survey of 134 (99%) of CAMHS and eating disorder units was undertaken in the United Kingdom to identify current practice. The results captured a range of practice around method of delivery, frequency, volume of the enteral feed and highlighted the need for a consensus. It is the first of its kind and the only data on the process of feeding under restraint. However, the study is in child and adolescent populations only and no data exists for adult units. It was an electronic survey where either a dietitian, lead nurse or unit manager gave the information based on their clinical experience and relies on memory recall. The audit showed that patients tolerate volumes of feed up to 1,000 ml at a time. Administering these bolus feeds was best facilitated by a syringe bolus (to reduce the time spent in restraint).

## Results – The Guidelines

### Offering of food and or oral supplement drinks

- Food and or oral supplement drinks should always be offered in a supportive manner prior to considering NGT feeding; never assume based on a patient's previous behaviour that they will refuse to eat or drink. Unless it causes undue distress, it is often useful to continue to offer food and or oral supplements at mealtimes in order to give the option to prevent the use of the NG tube.
- At the point of passing NGT the patient should be offered another opportunity to take nutritional supplements and or water orally in order to ensure that least restrictive practice is being carried out and that every opportunity to take oral food and fluid has been offered.
- Every patient should have a detailed and individualised dietetic and meal plan in place so that clear expectations have been set and this should state how much the patient needs to eat in order to avoid next bolus feed.

### Feed boluses

- Feeds are delivered via syringe bolus and not gravity bolus or enteral pump to ensure delivery in the most appropriate timeframe. In specialist mental health in-patient services, common practice implies that it is safe to start at one 50ml syringe per minute and increase as tolerated to two 50ml syringes a minute with careful monitoring.
- Bolus feeds can be started at 500ml per bolus, delivered over five to ten minutes (this volume includes any pre and post NGT feed flushes) and this can be increased every day by 100-200ml up to 1,000ml as required.
    - Delivering boluses >1,000ml has been managed safely but it is not viewed as standard practice.
    - When working with young children it would be appropriate to adopt a more cautious approach with the initial bolus size and rate of increase.
- The number of feeds a day is reduced to two in order to reduce episodes of distress and risk to the patient as well as staff [(11)]. One feed a day could be considered in extreme circumstances when there are no concerns around the patient's physical health. Areas for concern would include patients who are a very low weight, those with low blood sugars or those at risk of refeeding syndrome. Some degree of clinical judgement is required to assess those individuals where additional caution is required. Furthermore, one feed a day of up to 1,000ml will rarely meet a patient's fluid requirements so they will either need to be encouraged to drink water or receive a water bolus (for which there

may be significantly less resistance). If a patient is on one or two feeds a day, monitor the patient's liver function tests to ensure that this is tolerated.

- When NGT feeding as a short-term intervention, using a high calorie feed (2-2.4kcal/ml) ensures maximum nutrition can be delivered in a small volume. However, this may lead to very high levels of protein and high levels of some micronutrients being delivered and the patient will need their urea levels checked to see if this is being tolerated. If urea levels become raised, during longer term feeding, consider switching to a lower energy and protein feed (1–1.5kcal/ml).
- Oral supplement drinks containing additional fibre may be required to address any issues with constipation if used as a sole source of nutrition.

**Fluid**

- Water can be added to the feed bolus to reduce the viscosity of feed thus aiding the administration of the feed via syringe.
- Fluid requirements are documented by the dietitian and nursing staff are advised on how to manage this alongside any oral fluids completed.
- In cases when fluid is being refused, a lower threshold for intervention may be considered as in this situation patients are more vulnerable to medical instability.

**Refeeding Syndrome**

- If a patient is at risk of refeeding syndrome the appropriate medical monitoring for refeeding is adopted as well as any prophylactic vitamin and mineral supplementation in line with local policy.
- If a patient is at risk of refeeding syndrome it is important to avoid underfeeding:
    - In patients under the age of 18 years starting at 1,200kcal/day has been proven to be safe with appropriate medical monitoring [16].
    - In adult patients starting at 30-35kcal/kg body weight is used in practice [17,18].

**Tolerance**

- A patient's tolerance to syringe bolus feeding regimen is monitored daily and adjusted if a patient has any adverse symptoms related to bolus volume or rate.

**Dietitians should not:**

- Endorse the delivery of bolus feeds via enteral pumps or delivery via gravity boluses where the patient is resisting feeding (unless medically indicated) as the delivery rate is too slow and the restraint will become prolonged.
- Support the use of nasal bridals unless there is a specific medical reason to do so.

**Other individual care plan considerations within the MDT**

- Every hospital should have a clear care plan for management of NGT feeding when physical interventions are required to ensure patient and staff safety and consistency
- Dietitians should encourage the use of existing risk assessment frameworks in order to identify when a patient's life may be at risk [2,3] and ensure that teams have their own policies regarding low blood sugar levels and when to treat. Always treat if someone is symptomatic of hypoglycaemia and be aware that complex medical conditions, for example liver failure, may result in someone having a lower threshold of when medical intervention is required.
- Consider medical review if a restraint has lasted longer than 20mins (hospitals should have their own policy regarding if a presence of a doctor is required for the duration of the restraint)
- Consider requesting a medication review to see if any pharmacological adjuncts could be prescribed to reduce resistance and distress [19].
- Dietitians should always be aware of additional psychiatric risks that these patients may have and endorse the removal and subsequent reinsertion of the NGT at each feed if there is a safety risk for example, ligature or risk that the patient may be self-aspirating the feed via the NGT after the restraint has finished
- Dietitians should not endorse a patient being NGT fed in a supine position (unless there is a specific medical reason) patients should only be restrained in a seated position
- Do not leave NGT's in situ for longer than indicated by manufacturing guidelines due to the risk of the NGT deteriorating and nasal pressure sores.
- Continuously review, the need for NGT feeding under restraint as an MDT

**<u>Summary of key recommendations</u>**

If NGT feeding under restraint is required a change in dietetic practice is needed in relation to:

- Delivery of nutrition via push syringe bolus
- Reduce the number of feed boluses a patient receives in a day to one or two feeds a day
- Increase the volume of feed boluses to up to 1,000ml as tolerated

All physical and mental health services should be aware of how their existing nutrition policies need to be adapted in order to treat patients who are detained under the MHA.

## Discussion

Patients with AN can often be seen as ‘difficult’ to manage by clinicians not specialist in eating disorders as they very often present with little apparent motivation to get better and are resistant to treatment. There are a limited number of SEDU beds, consequently, patients may become medically compromised whilst waiting for treatment. NGT feeding a patient against their will may be a clinical intervention that saves their life whilst awaiting appropriate psychological treatment. The BDA guidelines offer a starting point for clinical treatment that is based on available evidence and multi-professional consensus. Agreement on rate, volume of feed, and how this is delivered safely but within legal frameworks adds significantly to dietetic practice in enteral feeding.

One of the clear strengths in the development of these guidelines is that nearly all the dietitians who participated in this working group are experts in their field and their experience spanned both CAMHS and adult services. Following a modified Delphi method allowed a clear framework when developing the guidelines. However, if this process were to be repeated it may be useful to include dietitians who are not specialist in this area to highlight their concerns. Furthermore, as the dietitians were from four different countries (England, Wales, Scotland and Ireland) the working group never actually met formally.

There was little disagreement within the working group. Three aspects did create clinical discussion. Firstly, the size of the bolus delivered, delivering only one bolus feed a day in specific circumstances, and medical monitoring after a patient’s receipt of the intervention. Some dietitians had no experience of patients being given bolus sizes over 700ml whereas others had patients who had tolerated up to 1,300ml. Therefore, we agreed that a maximum of up to 1,000ml was to be advised within the range of normal practice. Secondly, some dietitians had no experience in managing patients who had only one bolus feed a day. However, eight of 16 of the working group were familiar with this scenario so it was felt that the guidelines could state to ‘consider’ rather than ‘standard practice’. Finally, some dietitians had experience of only NGT feeding under restraint if there was a doctor on site to monitor the patient, whereas others had access to medical support via telephone, especially at weekends. Therefore, we agreed to recommend that each hospital should have their own policy as it was felt outside dietetic scope to comment on this further.

There is a need for further multi-professional guidance in regards to NGT feeding under restraint as clinicians understand that it may be needed in “lifesaving circumstances” but these are not defined. Many mental health services use existing medical monitoring

frameworks [2,3] to define when a patient is medically unwell. However, as this intervention can be seen as an aggressive or invasive treatment it must be fully weighed against the patient's quality of life. Regular and full MDT reviews of patient's treatments, including second or external opinions from an eating disorders psychiatrist and the role of the court of protection should be considered in cases of prolonged feeding against a patient's will with little treatment response [20]. Furthermore, there are no existing guidelines regarding when to stop this treatment if a patient's life is no longer at risk nor under what circumstances outside of 'lifesaving' could NGT feeding against a patient's will be appropriate.

The benefits of these guidelines are that for patients requiring NGT feeding against their will under the MHA will receive their nutrition in line with legal guidance. The risk of not following these guidelines is a delay to patients receiving life-saving nutrition resulting in prolonged morbidity or mortality, or treatment being delivered outside of the legal requirement for least restrictive practice for example, potentially held in restraint for longer than necessary whilst being fed via an enteral pump or restrained numerous times in a day. These clinical guidelines should be updated at least every three years to reflect new evidence and clinical experience and then reviewed by the working group as well as external review.

There is not yet guidance around other aspects of NGT feeding under restraint such as: medication strategies, nursing care planning, ethical considerations and the therapeutic impact this intervention may have. There is a need for more research to be done in this clinical area for example case examples of how these guidelines are put into practice [21], ways of improving patient compliance with refeeding to avoid NGT feeding; how patients, guardians, and professions make the decision to use NGT feeding?

## Conclusion

We have developed the first consensus based dietetic guidelines regarding NGT feeding under restraint practice in patients with AN. The consensus was reached by specialist dietitians with working experience of this clinical intervention across a number of countries. National audits should be carried out to identify how many Dietitians are aware of these guidelines and how many have found them supportive if they have had to NGT feed a patient under restraint.

**Declaration of transparency:**
The authors affirm that this manuscript is an honest, accurate, and transparent account of the guidelines being reported. No important aspects have been omitted. No funding was received for the development of these guidelines or manuscript.

**Conflict of interest**:
The authors and working group declare no conflicts of interest.

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Sarah Fuller and Ursula Philpot take full responsibility for the content of this paper and would like to acknowledge the working group in the development of the guidelines:

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