Guideline for the Clinical Dietietic Management of Adult Inpatients at Risk of Refeeding Syndrome

University Hospitals of Leicester NHS
NHS Trust

C55/2015

1 Introduction

1.1 Refeeding syndrome (RFS) can be described as a group of biochemical shifts and clinical symptoms that may occur in a malnourished or starved individual upon the reintroduction of oral, enteral, or parenteral nutrition (Soloman & Kirby, 1990).

1.2 There is no universally agreed definition of RFS and the true prevalence is not known. The National Institute for Health and Care Excellence (NICE) guideline CG32 (NICE, 2006: updated 2017) provide criteria to determine the level of RFS risk. RFS Management guidelines have been appraised in A Pocket Guide to Clinical Nutrition (Todorovic & Mafrici, 2018) with recommendations for dietetic and clinical practice.

1.3 The aim of this guideline is to:

a) Improve dietetic practice to comply with national guidelines

b) Minimise inconsistencies in practice between dietitians to ensure a safe nutritional care plan can be implemented.

2 Scope

2.1 This guideline applies to all adult inpatients that are to commence nutritional support as either oral nutritional support and/or prescribed oral nutritional supplements, and/or enteral tube feeding.

2.2 It does not apply to adult inpatients that are:

- Commenced on pre-existing enteral feeding regimens without a feed break e.g. Nasogastric, Gastrostomy, or Jejunostomy
- Commenced on the out of hours enteral starter regimen (UHL trust reference B55/2006)
- Admitted to clinical areas with their own enteral protocols e.g. critical care (UHL trust reference C24/2020)).
- Receiving parenteral nutrition, (UHL trust reference B22/2015)

2.3 This clinical guideline is for the use of Dietitians across University Hospitals of Leicester NHS Trust. It can also be used by Dietitians in the training of undergraduate Dietitians on clinical placement.

2.4 Any Dietitian using this guideline must be aware that this is guidance only and that the Dietitian assessing the inpatient is responsible and accountable for their assessment and nutritional care planning. Any clinical reasoning must be documented in the medical case notes.

2.5 The Dietitian is responsible and accountable for:

- identifying if the inpatient is at risk of refeeding syndrome.
- identifying the level of refeeding risk.
- implementing an appropriate and safe oral/enteral nutritional care plan.
- using Appendix 1, 2 and 3, if needed and as appropriate.
- documenting in medical notes, documenting into electronic handover systems (as appropriate) and verbal handovers to multidisciplinary team.
- ensuring ongoing and appropriate dietetic monitoring/review of the inpatient whilst under dietetic care.

3 Recommendations, Standards and Procedural Statements

Assessment

3.1 The Dietetic assessment must consider the level of risk of refeeding syndrome using the following:

Table A: NICE Guideline Criteria for Defining Risk of Refeeding Syndrome

AT RISK	Little to nil nutritional intake for >5 days, seriously ill or injured and due to start nutritional support.
HIGH RISK	**Patient has one or more of the following:** ▪ *BMI less than 16 kg/m^2 ▪ *Unintentional weight loss greater than 15% within the last 3–6 months ▪ Little or no nutritional intake for more than 10 days ▪ *Low levels of potassium, phosphate, or magnesium prior to feeding.
	OR patient has two or more of the following: ▪ *BMI less than 18.5 kg/m^2 ▪ *Unintentional weight loss greater than 10% within the last 3–6 months ▪ Little or no nutritional intake for more than 5 days ▪ *A history of alcohol abuse or drugs including insulin, chemotherapy, antacids, or diuretics
EXTREMELY HIGH RISK	**Patient with:** ▪ *BMI <14 kg/m^2 ▪ Negligible intake for > 15 days

NB: the limitation of this guidance should be acknowledged, and risk factors shown with * are likely to only be true risk factors in the presence of starvation.

3.2 When estimating previous nutritional intake, this should include food, oral fluids, nutritional supplements plus glucose provision from intravenous (IV). Also consider any concern with absorption of dietary intake which will increase refeeding risk even if the patient is consuming more than 10kcal/kg/day.

3.3 Once a patient has been identified as at risk of refeeding syndrome, a nutritional management plan should be instigated using appendix 2 as a guide. If a patient has no refeeding risk identified, but is due to start enteral feeding, consider commencing at approximately 50% of the final rate/volume on the first day to establish gastrointestinal tolerance, aiming to build up to full requirements (final rate/volume) by day 2 and onwards.

3.4 **Electrolyte & Micronutrient Provision**

3.4.1 Electrolytes (potassium, phosphate and magnesium should be check prior to initiating nutritional support and the patient's basic requirements for electrolytes should be met from the onset of feeding.

3.4.2 It should not be assumed that there is low/no risk of RFS if electrolytes are in the normal range prior to feeding. It is common for electrolytes to be within normal parameters prior to feeding due to homeostatic mechanisms (NICE 2006).

3.4.3 Low electrolytes can be seen for other reasons than RFS e.g. hypophosphatemia due to metabolic or respiratory acidosis and hypomagnesaemia due to chronic diarrhoea.

3.5 Additional electrolytes should be provided if low levels are observed during refeeding, following appropriate guidance (but check InSite for the latest UHL guidance available).

3.5.1 **Potassium:** UHL policy (Potassium solutions for intravenous administration including guideline for hypokalaemia UHL policy (UHL Ref B1/2018))

3.5.2 **Magnesium:** UHL guideline (Guidelines for The Management of Hypomagnesaemia (UHL Ref C10/2002))

3.5.3 **Phosphate:** Hypophosphataemia.pdf (gloshospitals.nhs.uk)

3.6 Feeding and correction of electrolytes should occur concurrently. There is no need to delay the initiation of oral/enteral nutrition whilst low electrolyte levels are corrected.

3.7 The Dietitian has a key role in highlighting the need to monitor and ensure appropriate electrolyte provision to the wider multidisciplinary team. A medical note sticker (see Appendix 3) should be used to facilitate communication, or this should be documented electronically on Nerve Centre. The Dietitian should communicate this verbally where possible to the managing medical team.

3.8 **Micronutrient supplementation for patients at high or extremely high risk of RFS**

3.8.1 NICE (2006) recommends that patients at high or extremely high risk of refeeding syndrome are prescribed the following immediately before and during the first 10 days of feeding:

- Oral thiamine 200–300 mg daily
- Vitamin B co strong 1 or 2 tablets TDS
- **and** a balanced multivitamin/trace element supplement OD

OR

- Full dose daily intravenous vitamin B preparation, if necessary

3.8.2 Whilst the duration of supplementation is based on NICE (2006) this is grade D evidence and other studies have suggested durations of 2 – 7 days (PENG, 2018).

Monitoring

3.9 72 hours after initiation of nutrition support is the key period for supplementation and

monitoring. Patients with low serum electrolytes should continue to have their biochemistry monitored until levels are in the normal range on full nutritional support.

3.10 If the patient is considered at high refeeding risk and discharged from hospital is planned prior to stabilisation of the feeding regimen/ biochemistry, a management plan should be agreed with the discharging medical team, i.e. it is their responsibility to arrange, check and action any abnormal biochemistry results rather than the GP.

Appendices	
No.	**Action**
1	Identification of Refeeding Syndrome Risk
2	Nutritional Care Planning for patients deemed at risk of Refeeding Syndrome
3	Medical advice regarding electrolyte and micronutrient supplementation

4 Education and Training

The professional staff authorised to use this guideline as detailed in section 2 must have received relevant training in this patient population and accept responsibility for updating knowledge and skills on a regular basis to maintain competency. NB No new skills or training are required as this document is to raise awareness of the process Dietitians need to follow.

Dietetic staff can use this to aid student dietetic training for those who undergo their clinical placements as part of their undergraduate degree to become a registered Dietitian.

5. Monitoring Criteria

Key Performance Indicator	Method of Assessment	Frequency	Lead
Level of refeeding risk must be identified and documented in adult inpatients' medical notes for inpatients that are to commence enteral feeding or inpatients who are on oral diet where there is concern of refeeding risk	Audit	Every 2 years	Chair of Dietetic & Nutrition Service Nutrition Support Steering Group
Appendix 3 sticker, or equivalent, must be documented in adult inpatients' medical notes for those assessed to be at high or very high risk of refeeding syndrome	Audit	Every 2 years	As above

6. Supporting Documents and Key References

College Report CR189 from the Royal College of Psychiatrists. (2014). MARSIPAN: Management of Really Sick Patients with Anorexia Nervosa (2nd edn).

British Association of Parenteral and Enteral Nutrition (BAPEN 2024) Nutritional assessment

National Institute for Health and Care Excellence. (2006; updated August 2017) Nutrition support for adults: oral nutrition support, enteral tube feeding and parenteral nutrition. NICE guideline (CG32).

Solomon, S.M., Kirby, D.F., (1990) The refeeding syndrome: a review. *Journal of Parenteral & Enteral Nutrition* **14**(1): 90-97.

Culkin, A & White R (2018) Refeeding in A pocket guide to clinical nutrition, Todorovic & Mafrici, British Dietetic Association (5th edn)

7. Key Words

Refeeding, RFS, Dietetic, refeed, enteral

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Date	**Issue Number**	**Reviewed By**	**Description Of Changes (If Any)**
March 2024	V4	Tabassum Lala	Grammar, spelling, typo errors resolved, appendix 2 table colour coded and amended to match PENG, Table A colour coded, micronutrient sticker amended
Feb 2021	V3	Melanie Baker	Amended to reflect new national guidelines
June 2018	V2	Hannah Starling	Format change, review of NICE CG32 guideline and micronutrient sticker revised

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Appendix 1

This includes food, oral fluids, supplements and IV/SC fluids. See table for commonly used solutions. Specialist areas may have additional fluids that need to be taken into account.

Solution	Quantity (mls)	Glucose (g)	Energy (kcal)
Dextrose 4%/ saline 0.18%	1000	40	160
Dextrose 5%	1000	50	200
Dextrose 10%	1000	100	400

Is the patient in a starved state? This would be if they have consumed ≤10kcal/kg on average for >5 days (or more than this but concern over significant malabsorption (vomiting, diarrhoea, GI fistula, high output stoma etc)

No

Dietitian to exert clinical judgement if the patient is malnourished, as low BMI or recent significant weight loss will put the patient in the 'at risk or Extremely High Risk' category

Yes

Do they have 1 of the following?:
- BMI <16kg/m^2
- >15% unintentional weight loss in the last 3-6 months
- <10kcal/kg for >10 days
- low potassium, magnesium, or phosphate levels prior to feeding

OR

Do they have 2 of the following?:
- BMI <18.5kg/m^2
- >10% unintentional weight loss in 3-6 months
- <10kcal/kg for >5 days
- history of alcohol abuse or some drugs including insulin, chemotherapy, antacids, or diuretics

Yes

HIGH RISK

Do they have 1 of the following?:
- BMI <14kg/m^2
- <10kcal/kg for >15 days

No

Yes

Extremely HIGH RISK

Dietitian to exert clinical judgement where appropriate,
e.g. BMI >30kg/m^2, in starved state but does not fit the refeeding risk criteria

Appendix 2

<table>
<tr><th></th><th>AT RISK</th><th>HIGH RISK</th><th>EXTREMELY HIGH RISK</th></tr>
<tr><td>DAYS 1 - 2</td><td>Initiate nutrition support between 10-20kcal/kg/day for the first 24 hours, or up to 48 hours if deemed clinically relevant.</td><td>Initiate nutrition support between 10 – 20kcal/kg/day, plus the average of previous oral intake for first 24 hours.

Increase feed incrementally, aiming for 20kcal/kg/day within 48 hours unless contraindicated.</td><td>Initiate nutrition support at a maximum of 10kcal/kg for the first 24</td></tr>
<tr><td>DAY 3</td><td rowspan="3">Increase as tolerated to meet 100% of nutritional requirements</td><td rowspan="3">Increase by 15-20kcal/kg each day until 100% of requirements are met</td><td>Increase to 15 - 20 kcal/kg for 24 hours</td></tr>
<tr><td>DAY 4</td><td rowspan="2">Increase by 5-10kcal/kg each day until 100% of nutritional requirements are met.

Adopt a more cautious approach to increasing calorie provision, with incremental calorie intake increasing to meet/ exceed full requirements by 4-7 days.</td></tr>
<tr><td>DAYS 5 - 7</td></tr>
<tr><td colspan="4">Aim for balanced energy provision of approximately 40-50% of energy as carbohydrate.</td></tr>
<tr><td colspan="4">Not deemed at risk of RFS: Aim to meet full estimated requirements within 24-48hrs depending on gastrointestinal tolerance.</td></tr>
</table>

Above table referenced using PENG 2018

Appendix 3: Medical Note Sticker

Electrolyte & micronutrient supplementation for patients <u>at high or extremely high risk</u> of refeeding syndrome

<u>MEDICAL TEAM – Please ensure:</u>

Blood **potassium, magnesium, and phosphate** levels are checked **<u>daily</u>** until stable. Replace if necessary as per UHL guidance. If no UHL guidance see www.sps.nhs.uk

Immediately before feeding consider prescribing:

Intravenous:

- Pabrinex ampoules I and II once daily for 3 – 10 days

<u>OR</u>

Oral/ Enteral (to be prescribed for 10 days):

- Thiamine 100mg BD
- Vitamin B co strong 1 tablet TDS
- Forceval 1 tablet OD (or Forceval soluble if via enteral feeding tube/ dysphagia/ clinical indication)

NB: In patients with chronic kidney disease (CKD), please discuss with ward dietitian for suitable micronutrient supplementation.

The above is to be printed as a sticker by the Dietitians and put into their dietetic entries in patients' medical notes.