

# Guidelines for Prevention and Management of Refeeding Syndrome in Adults

<b>Policy Title:</b>	Guidelines for Prevention and Management of Refeeding Syndrome in Adults		
<b>Executive Summary:</b>	To provide guidance for the prevention and management of Refeeding Syndrome in adult inpatients at East Cheshire NHS Trust (ECT).		
<b>Supersedes:</b>	New Guidelines		
<b>Description of Amendment(s):</b>	New Guidelines		
<b>This policy will impact on:</b>			
All clinical staff caring for adult inpatients at East Cheshire NHS Trust.			
<b>Financial Implications:</b>			
Effective, timely prevention and early management of refeeding syndrome will reduce costs associated with the adverse medical outcomes of unmanaged refeeding syndrome.			
<b>Policy Area:</b>	Trust Wide	<b>Document Reference:</b>	ECT002366
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Flow diagram for ECT Management of Refeeding Syndrome

#### **Appendix 2:**

Equality and Human Rights Policy Screening Tool

## **1.0 INTRODUCTION**

The term Refeeding Syndrome encompasses the adverse consequences which can occur in the early stages of providing nutrition to a malnourished individual (if the proper preparation and management is not employed.) These include:

- Acute thiamine deficiency resulting in Wernicke's encephalopathy and Korsakoff syndrome, with the potential for permanent cognitive impairment (loss of short term memory.)
- Hypophosphataemia, hypokalaemia and hypomagnesaemia
- Fluid overload resulting in cardiac failure.

Even in a well nourished individual, there is sufficient tissue reserve of thiamine for only 21 days. In the malnourished patient thiamine levels may be very close to total depletion. During starvation, usage of thiamine is low. Once feeding begins however, the absorption of carbohydrate leads to usage and degradation of thiamine at the entry point to and within the Krebs's cycle. Frank deficiency of thiamine can then occur, leading to the onset of Wernicke-Korsakoff syndrome, or cardiac sequelae.

Starvation causes adaptive reductions in cellular activity and organ function, accompanied by electrolyte and micronutrient depletion. Insulin concentrations decrease and glucagon levels rise, resulting in gluconeogenesis and the breakdown of protein and lipid. Free fatty acids and ketone bodies replace glucose as the major energy source. Refeeding (oral, enteral or parenteral nutrition) triggers a switch from fat to carbohydrate metabolism, with consequent insulin release, and increased shift of potassium, phosphate and magnesium and water into cells.

In the starved individual, cardiac mass may be significantly depleted, leading to the risk of fluid overload and cardiac failure if feed and fluid provision is too rapid or too great.<sup>1</sup>

## **2.0 AIMS**

The aim is to provide evidence based guidance and establish consensus within the Trust on the consistent identification, prevention and management of Refeeding Syndrome.

## **3.0 ORGANISATIONAL RESPONSIBILITIES**

The Executive Director of Nursing, who is a member of the Trust Board, has overall responsibility for the provision of nutrition within ECT. The Clinical Nutrition Steering Group (CNSG) is responsible for the oversight of all aspects of nutrition within ECT and is accountable to the Quality Strategy Steering Group, which is in turn accountable to the Trust Board via the Safety and Quality Standards Committee (SQS). For further information regarding the role and responsibility of the CNSG in the provision of nutrition, refer to the East Cheshire NHS Trust Nutrition Policy for in-patients (CNSG001).

All clinical service team managers are responsible for ensuring compliance with this guidance within their unit/team and that staff are competent and attend appropriate training.

Certain professional groups and departments have specific responsibilities.

### **3.1 Medical Staff are responsible for:**

- Promoting awareness of the risks, prevention and management of Refeeding Syndrome when initiating nutritional support.
- Prescribing thiamine *before* starting nutrition support in patients at risk of Refeeding Syndrome.
- Ensuring appropriate and timely biochemical monitoring and supplementation of electrolytes.
- Prescription of a multivitamin- mineral preparation.
- 

**3.2 Dietitians** are responsible for:

- Assessing the referred patient's risk of Refeeding Syndrome.
- Assessing the referred patient's nutritional requirements and where appropriate prescribing the appropriate enteral or parenteral feeding regimen.
- Assisting in promoting awareness of the risks and management of Refeeding Syndrome.

**3.3 Matrons and Ward Managers** are responsible for ensuring that:

- All patients are screened for the risk of malnutrition using the Malnutrition Universal Screening Tool (MUST) on admission and weekly thereafter.
- Nursing staff refer patients identified at risk of malnutrition (MUST score of 2 or more) to the Department of Nutrition and Dietetics.

**3.4 Ward Pharmacists** are responsible for:

- Ensuring that prescribable oral nutritional supplements are correctly prescribed.
- Advice on thiamine and electrolyte prescription.

**3.5 Biochemists** are responsible for:

- Advice on biochemistry results with appropriate recommendations for management of electrolytes and micronutrients.

#### **4.0 IDENTIFYING PATIENTS AT RISK**

Any patient who has had little or no nutrition for over 5 days is at some risk. Severely malnourished patients are at very high risk of developing features of the Refeeding Syndrome. Patients can be categorised in the following way<sup>2</sup>:

##### **4.1 Patients at moderate risk** have had:

- Very little or no nutrition for over 5 days

##### **4.2 Patients at high risk**

Have **one or more** of the following:

- BMI less than 16 kg/m<sup>2</sup>
- Unintentional weight loss greater than 15% in last 3-6 months
- Very little or no nutritional intake for more than 10 days
- Low levels potassium, phosphate or magnesium prior to feeding

Or **two or more** of the following:

- BMI less than 18.5 kg/m<sup>2</sup>
- Unintentional weight loss more than 10% in last 3-6mths
- Very little or no nutritional intake for more than 5 days
- History of alcohol abuse, or drugs including insulin, chemotherapy, antacids and diuretics

##### **4.3 Patients at extremely high risk** have:

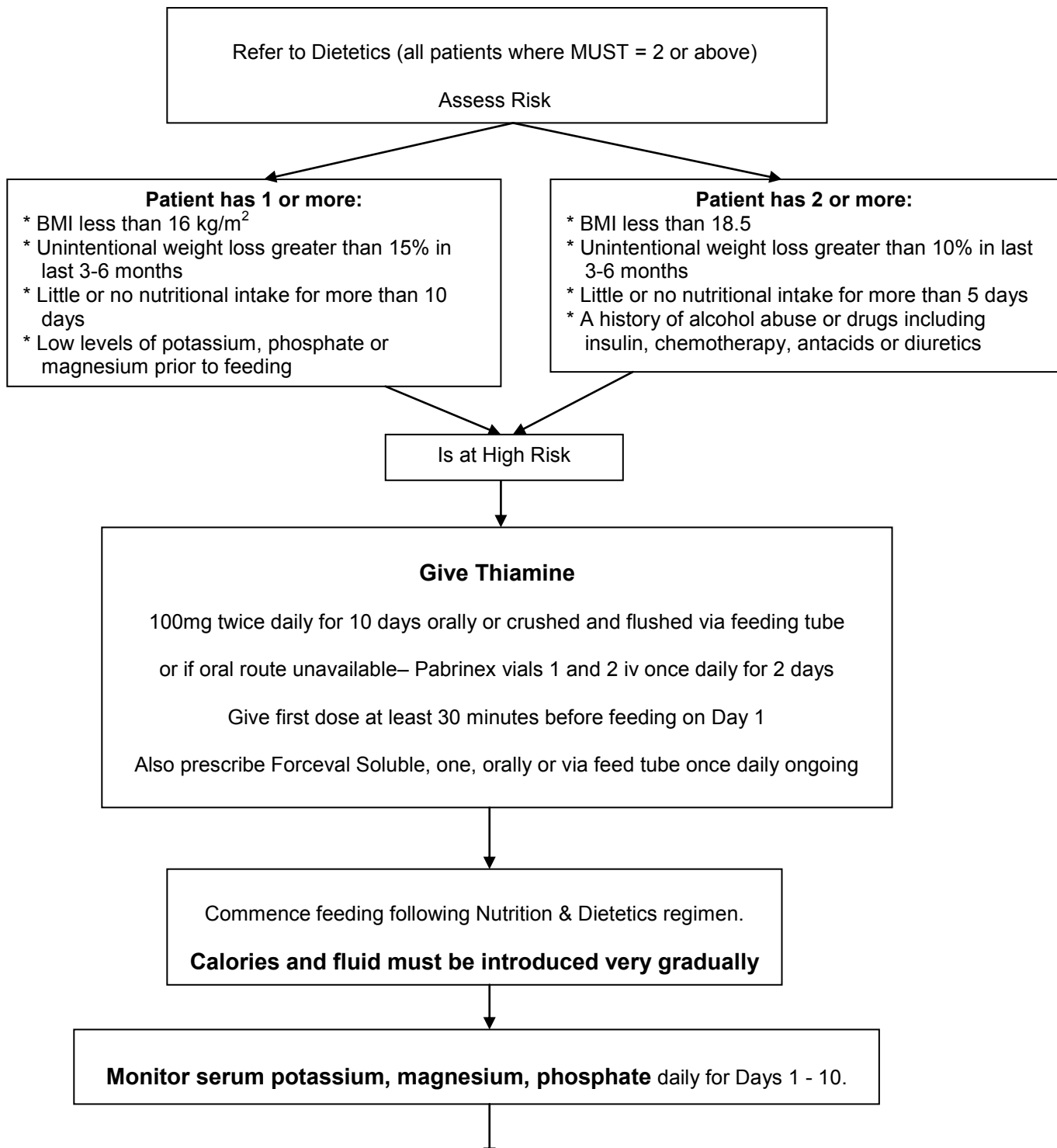
- BMI under 14 kg/m<sup>2</sup>
- Or - negligible intake for greater than 15 days

#### **5.0 MANAGEMENT**

In summary:

- **Assess risk**
- **Prescribe thiamine**
- **Feed and hydrate gradually**
- **Monitor electrolytes**

## Refeeding Syndrome Management Policy



Analyte All in mmol/L	Lower limit of RR	Significantly low	Critically low – phoned through
Potassium	3.5	3.0	2.5
Phosphate (adult)	0.8	0.5	0.35
Magnesium	0.7	0.5	0.4
		Oral supplementation (at least) recommended	May need parenteral supplementation

For ECT Guidelines on supplementation of low serum potassium, phosphate and magnesium, go to: *Intranet Home Page – Clinical Guidelines – Fluid and Electrolytes*

## 5.1 Assess Risk

First, assess and document the patient's risk of Refeeding Syndrome according to the NICE risk criteria shown above (4.1 – 4.3) by obtaining the relevant history. (At referral the dietitian will undertake this assessment.)

## 5.2 Prescribe Thiamine

- The first dose should be given *before* feeding starts on Day 1
- *Either* Thiamine 100mg, one tablet, two times a day p.o. (or can be crushed and administered via a feeding tube followed by water flush) if the patient has normal gastrointestinal absorption.
- *Or*: If the oral or tube feed route is unsuitable, give Pabrinex vials 1 & 2 i.v. once daily for two days only.

If a patient is on the alcohol withdrawal protocol, this requires greater frequency and duration of Pabrinex 1 & 2, and this greater frequency and duration must be adhered to.

- A comprehensive multivitamin-mineral should also be given. The relevant preparation stocked by ECT Pharmacy is **Forceval Soluble** orally or via feed tube, once daily for ten days.
- Patients starting PN ('TPN') should receive Pabrinex as described above *and* Cernevit i.v. and Additrace i.v. once daily at 1800h
- See also Appendix 1

## 5.3 Feed Gradually

At referral, the dietitian will arrange feeding as follows.

- Patients at moderate risk of Refeeding Syndrome –

Introduce nutrition support at a maximum of 50% of requirements for the first 2 days. Increase calorie provision only as clinical condition and electrolyte results allow.

- Patients at high risk of Refeeding Syndrome -

Commence nutrition support at a maximum of 10kcal/kg body weight. Consider providing only 5kcal/kg in patients at extremely high risk.

Do not discontinue feeding if electrolytes levels fall. Electrolytes cannot be successfully corrected without nutritional provision. However, where serum potassium, magnesium or phosphate levels are significantly low (see table below), feeding should not be advanced further until supplementation has occurred.

Increase calorie provision slowly over 4-7 days as clinical and biochemical monitoring allows.



## 5.4 Restore circulatory volume cautiously

Monitor fluid balance and clinical status. (Where possible, patients at extremely high risk should have continuous cardiac monitoring, as should any patient who develops cardiac arrhythmias.)

## 5.5 Monitor Electrolytes

It is not necessary to correct electrolyte levels before starting feeding<sup>2</sup>. However, blood levels of potassium, magnesium and phosphate should be measured daily and aggressively corrected as feeding proceeds.<sup>2</sup> guided by the table below. For most patients daily blood levels will need to be done for the first ten days.

Analyte	Lower limit of reference range (mmol/L)	Significantly low (mmol/L)	Critically low – phoned through (mmol/L)
Potassium	3.5	3.0	2.5
Phosphate (adult)	0.8	0.5	0.35
Magnesium	0.7	0.5	0.4
		Oral supplementation (at least) recommended	May need parenteral supplementation

### Supplementation

For ECT Guidelines on supplementation of low potassium, phosphate and magnesium, go to: *Intranet Home Page – Clinical Guidelines – Fluid and Electrolytes*

Or use the following links.

Potassium supplementation guidelines (ECT):

<http://nww.eastcheshire.nhs.uk/clinical/Fluid%20and%20Electrolytes/Guidelines/Hypokalaemia%20ECT2237.pdf>

Magnesium supplementation guidelines (ECT):

<http://nww.eastcheshire.nhs.uk/clinical/Fluid%20and%20Electrolytes/Guidelines/Hypomagnesaemia%202013-14%20ECT2130.pdf>

Phosphate supplementation guidelines (ECT):

<http://nww.eastcheshire.nhs.uk/clinical/Fluid%20and%20Electrolytes/Guidelines/Hypophosphatemia%20-%20Management%20in%20Adults%20Without%20Renal%20Impairment%20ECT2280.pdf>

See also Appendix 2

## 5.6 Considerations for Route of Nutrition Support

### 5.6.1 Oral

Malnourished patients are often self-limiting in their oral intake, but caution may be required when introducing diet and/or sip feeds. Refer to the risk categories above for safe levels of oral nutrition support.

In general, diet should be gently encouraged and nutritional supplements introduced initially at a low calorie level and gradually increased. Aim to use only nutritionally complete sip feeds under dietetic supervision

### 5.6.2 Enteral

Refer patient to Nutrition and Dietetics on Ext.1126 (24 hour answerphone) for assessment and provision of a suitable enteral feeding regimen.

Out of Hours follow the ECT starter enteral feeding regimen. This is available on the Intranet at *Policies – N* and hard copies are available in the Nutrition Folders. (On ICU an ICU-specific emergency enteral feeding regimen is available.)

### 5.3.3 Parenteral (PN)

Please refer to ECT's Parenteral Nutrition for Adults Policy (CNSG 002)

TPN should only be started after careful consideration and planning by the multidisciplinary team. "PN is not an emergency intervention in adults and there is rarely an indication for it to be started out of hours or at the weekend."<sup>6</sup>

The majority of patients for whom PN is indicated are acutely or chronically malnourished. Only a proportion of a full 1500 – 2500 mL PN bag, not the full bag, should be given daily in the first two to four days of feeding. Full bags contain high amounts of calories which exceed the safe amounts in the initial days of refeeding.

## References

1. Solomon S.M and Kirby D.F.1990 "The Refeeding Syndrome :a review". *J. Parenteral and Enteral Nutrition* **14**, 90-97
2. NICE (2006) CG032 "Nutrition Support in Adults"
- 3 .Stanga, Z et al. 2008 "Nutrition in Clinical Practice –The Refeeding Syndrome : illustrative cases and guidelines for prevention and treatment." *European Journal of Clinical Nutrition* **62**, 687-694
4. Parenteral and Enteral Nutrition Group of the BDA 2012 "Guide to Clinical Nutrition"
5. Gandy, J (Ed.) 2014 "Manual of Nutrition & Dietetics" 5<sup>th</sup> Edition, Wiley Blackwell

## Additions

6 NCEPOD 2010 “A Mixed Bag: An enquiry into the care of hospital patients receiving parenteral nutrition” [http://www.ncepod.org.uk/2010report1/downloads/PN\\_report.pdf](http://www.ncepod.org.uk/2010report1/downloads/PN_report.pdf)

## Appendix 1

NICE CG032 states:

“providing immediately before and during the first 10 days of feeding: oral thiamin 200–300 mg daily, vitamin B co strong 1 or 2 tablets, three times a day (or full dose daily intravenous vitamin B preparation, if necessary) and a balanced multivitamin/trace element supplement once daily.

However, vitamin B Co Strong:

- Provides only 5 mg B1, 2mg B2, 20 mg B3, 50 mg B6 per tablet
- Does not crush down to a powder (breaks into shards) for flushing via a feed tube.

Therefore after consideration vitamin B Co Strong has been omitted from the ECT guidelines. Needs are considered to be met by the remaining vitamin recommendations.

## Appendix 2

NICE CG032 states:

“providing oral, enteral or intravenous supplements of potassium (likely requirement 2–4 mmol/kg/day), phosphate (likely requirement 0.3–0.6 mmol/kg/day) and magnesium (likely requirement 0.2 mmol/kg/day intravenous, 0.4 mmol/kg/day oral) unless pre-feeding plasma levels are high. Pre-feeding correction of low plasma levels is unnecessary.”

The advice to supplement electrolytes even where they remain within the reference range is not generally followed, being seen as unnecessary and risking pushing levels above the reference range. It has therefore been judged appropriate to omit this recommendation from the ECT policy.