

Out of hours Enteral tube feeding (Nasogastric) Starter Regimen for an Adult Inpatient With Renal Failure Acute Kidney Injury or Chronic Kidney Disease 3-5 on a Renal Ward Only

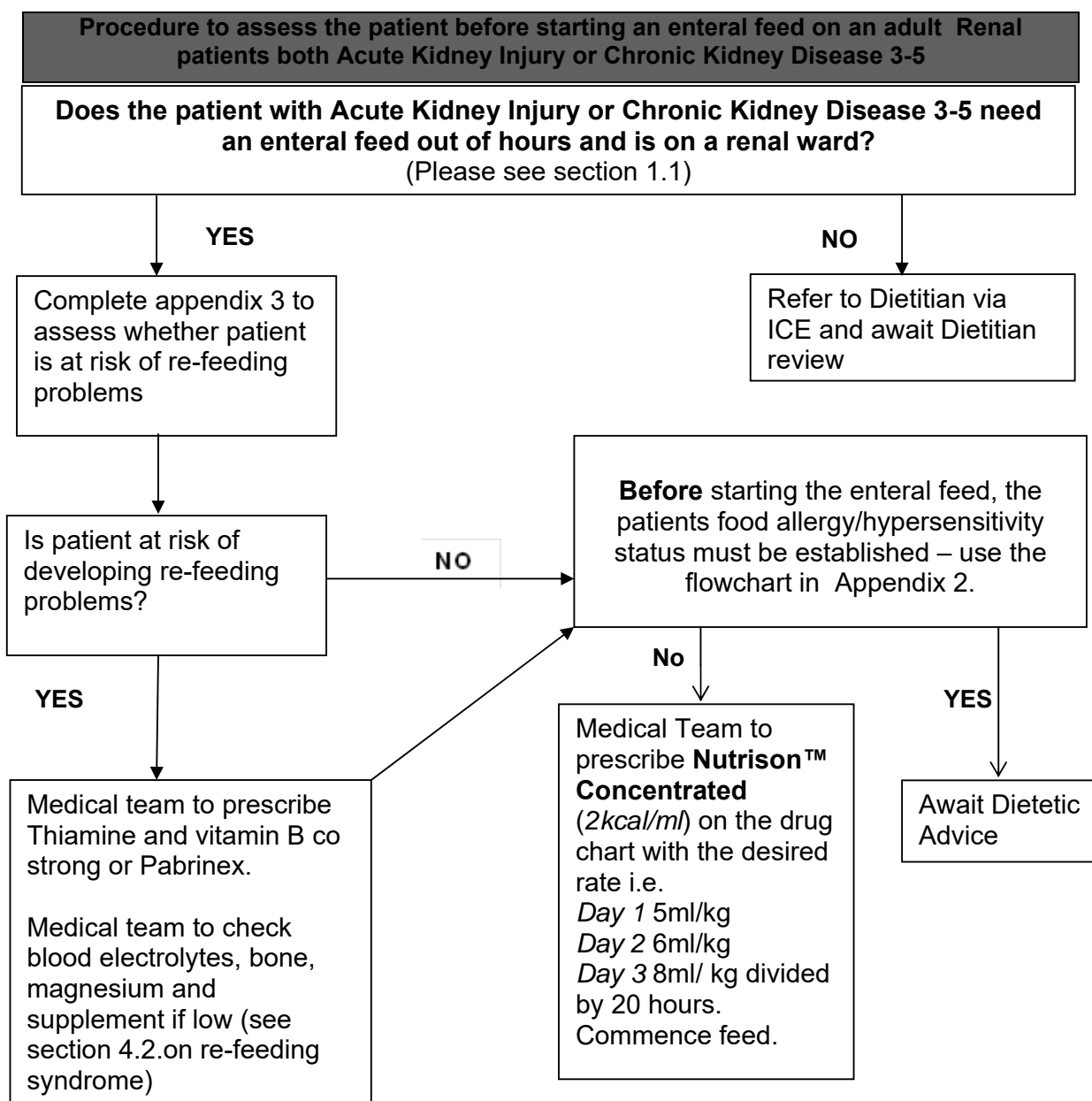
**(Including management of re-feeding syndrome)
Guidance for Practice**

1. Introduction

- 1.1 This clinical guideline provides advice and information on starting the administration of an enteral tube feed via a nasogastric feeding tube in **adult inpatients with Chronic Kidney Disease 3-5 or Acute Kidney Injury on a Renal Ward only (See management of Acute Kidney Injury in adult patients B21/2009)** out of hours. That is at weekends and bank holidays or when there is no Dietitian available to undertake an individual nutritional assessment, calculate nutritional requirements and design an enteral feeding regimen. It can also be used to assess re-feeding risk in a patient with any sort of feeding tube.
- 1.2 The types of adult patients with Acute Kidney Injury or Chronic Kidney Disease 3-5 on a Renal Ward who are identified as in need of enteral nasogastric feeding over the weekend and / or bank holiday period may often be very under-nourished. Re-feeding problems can occur when starting an enteral feed in this vulnerable group of patients if it is not identified and treated appropriately.
- 1.3 Each patient will require risk assessment for re-feeding risk, prior to commencing the enteral feed and treat appropriately. Further information on re-feeding can be found in appendix 1 and assessment proforma as per appendix 3.
- 1.4 This Clinical Guideline does not replace an individual dietetic assessment and referral to the Dietitian is required as soon as possible for assessment and ongoing monitoring. Referrals must be made via ICE and can be made at any time of the day. Dietitians will respond promptly to a referral but it is not always possible on the same day. The standard response time is 2 working days
- 1.5 This guideline is for use by Medical and Nursing teams to enable them to start an enteral feed on an adult Renal patients both Acute Kidney Injury or Chronic Kidney Disease 3-5 on a renal ward when a Dietitian is unavailable to provide a feeding regime.
- 1.6 It applies to any tube type e.g. PEG, RIG, Jejunostomy where the patient has not been fed. Staff must follow the relevant tube checks in the 'Insertion and Management of Nasogastric and Nasojejunal Tubes Policy and Procedures' (Trust ref B39/2005) before commencing any feed.
- 1.7 This guideline ONLY applies to Renal patients both Acute Kidney Injury or Chronic Kidney Disease 3-5 on a renal ward. It does not apply to the critical care patients who have their own guidelines (Guideline for Commencing Nasogastric Feeding in Adult Patients on Critical Care B42/2016) or other patient groups who also have an adult inpatient feeding guideline (Guideline for Out of Hours Enteral Tube Feeding (Nasogastric) in Adult patients (including Management of Re-feeding Syndrome) B55/2006)
- 1.8 Feeds must not be started in patients on specialised diets such as those on Ketogenic diets for intractable epilepsy, or an inherited metabolic disease/disorder e.g. PKU until assessed by a Dietitian who will advise on feeding in these patient groups.
- 1.9 For patients who have a known or suspected food allergy or food hypersensitivity/intolerance, please use appendix 2 to assess feed suitability **before** starting enteral feed.

2. Guideline Standards and Procedures

2.1 The following flowchart details the procedure to follow to assess the patient with Renal patients both Acute Kidney Injury or Chronic Kidney Disease 3-5 on a renal ward before starting an enteral feed



In cases of extreme high risk of re-feeding syndrome consider starting at 5 Kcal/kg bodyweight i.e 2.5ml/kg Nutrison™ Concentrated. The definition of extreme high risk is BMI less than 14kg/m², little intake for more than 15 days or weight loss more than 20% body weight.

Follow all tube checks in UHL policy Insertion and Management of Nasogastric & Orogastric Tubes in Adults (Trust Ref B39/2005)

2.2 Supporting Information: Food Allergies and enteral feeds.

- a) Approximately 3-4% of adults have a food allergy in westernised countries (Sicherer & Samson, 2010). The most common allergens are nuts, peanuts, sesame seeds, fish, shellfish, cow's milk and eggs (Wright 2007).
- b) **It is crucial to check the patients food allergy status.**
- c) **Before** starting enteral feed, please use the flowchart in appendix 2 to ascertain food allergy/hypersensitivity status and feed suitability.
- d) If a patient /relative request a feed which is suitable for those who follow a strict vegan diet, we may be unable to provide this with the feeds available within the hospital. However, please use appendix 2 to discuss with the patient/relative why the feed may be unsuitable so they can decide if it applies to them. Refer to the ward Dietitian as soon as possible via ICE.

2.3 Supporting information: Re-feeding syndrome (More details can be found in appendix 1)

- a) Patients at risk of re-feeding syndrome should commence enteral feeding at very low levels of energy and protein but with generous provision of thiamine and other B group vitamins. A balanced multi-vitamin and trace element supplement should be given (since they are likely to have multiple deficits that cannot be met by low level oral, enteral or parenteral intake). Levels can then be increased over the next few days as careful monitoring reveals no problems.
- b) The prescription for people at high risk of developing re-feeding problems should consider:
 - Starting enteral nutritional support at a maximum of 10kcal/kg/day (**Nutrison Concentrated is 2kcal/ml**), increasing levels slowly to meet or exceed full needs by 4-7 days. For example, if a patient weighs 40kg:
 - $40 \times 10 = 400 \div 2 = 200 \div 20 \text{ hours} = 10\text{ml per hour} = \text{rate of feed}$
 - Restoring circulatory volume and monitoring fluid balance and overall clinical status closely.
 - Providing immediately before and during the first 10 days of feeding: oral thiamine 200-300mg daily, vitamin B compound strong 1 or 2 tablets, three times a day (or full dose daily intravenous vitamin B preparation, if necessary) and a balanced Renal multivitamin/trace element supplement once daily.
- c) Renal patients both Acute Kidney Injury or Chronic Kidney Disease 3-5 may not need supplementation of potassium or phosphate, but it is worth bearing it in mind that these levels can drop quickly after commencing enteral feeding. It is important to appreciate that patients with normal pre-feeding levels of potassium, magnesium and phosphate can still be at risk, and that many of those with high plasma levels will still have whole body depletion and may, therefore, need supplementation as re-feeding progresses.

In cases of extreme high risk of re-feeding syndrome consider starting at 5kcal/kg body weight. The definition of extreme high risk is BMI less than 14kg/m^2 , little intake for more than 15 days or weight loss more than 20% body weight.

2.4 Likely requirements for supplementation of potassium, phosphate and magnesium

Electrolyte/ Trace Element	Likely requirement
Potassium	2-4 mmol/kg/day (oral, enteral or intravenous)
Phosphate	0.3-0.6 mmol/kg/day (oral, enteral or intravenous)
Magnesium	0.2 mmol/kg/day intravenous or 0.4 mmol/kg/day oral or enteral

2.5. Procedure for Starting the Enteral Tube Feed on Renal patients both Acute Kidney Injury or Chronic Kidney Disease 3-5 on renal wards (when using this guideline see section 1 and 2)

Action	Rationale
1. Doctors to have checked bloods (potassium, bone profile and magnesium) prior to commencing nasogastric feed to determine level of refeeding risk	To ensure patients are assessed for refeeding syndrome appropriately and manage refeeding risk
2. Check position of nasogastric tube (NGT) as per UHL policy Insertion and Management of Nasogastric and Nasojejunal Tubes Policy and Procedures (Trust Ref B39/2005)	To ensure tube is in the correct position
3. Commence Nutrison™ Concentrated (Nutricia) feed at 5mls per kg for 20 hours (see flow chart on page 2)	To ensure that the kcals from the feed do not exceed 10 kcals per kg (as Nutrison™ Concentrated is a 2kcal/ml enteral feed)
4. Check for signs of abdominal distension, diarrhoea, nausea/vomiting	To ensure that patient is tolerating/absorbing the feed
5. 4 hour break	To allow the gastric pH to reduce
6. Day 2: Doctors to recheck bloods and supplement low levels of potassium, phosphate or magnesium or consider supplementing levels that have reduced. If tolerating feed increase rate to 6mls per kg	Gradual build up of the feed over 7 days
7. Check for signs of abdominal distension, diarrhoea, nausea/vomiting	To ensure that patient is tolerating/absorbing the feed
8. 4 hour break	To allow the gastric pH to reduce
9. Day 3: Doctors to recheck bloods and supplement low levels of potassium, phosphate or magnesium or consider supplementing levels that have reduced. If tolerating feed, increase rate to 8mls per kg	Gradual build up of the feed over 7 days

2.6 Nutritional Assessment and Nutritional Monitoring

- a) All inpatients receiving enteral nutrition via a nasogastric tube must be referred at the earliest opportunity to the ward Dietitian via ICE for individual nutritional assessment, calculation of nutritional requirements and design of enteral feeding regimen. Referral must detail when the enteral feed was started.
- b) People at high risk of developing re-feeding problems must be cared for by healthcare professionals who are appropriately skilled and trained and have expert knowledge of nutritional requirements and nutrition support e.g. Dietitians.

3. Education and Training

Ward Dietitians are responsible for ensuring their ward areas are aware of the Clinical Guideline and offer ward based training/education as needed.

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Number of Patients commenced on starter guideline have a tool completed to assess risk of re-feeding problems	Audit annually	Band 7 Senior Specialist Renal Dietitian	Annually	To report to Nephrology and Nutrition and Dietetics
The feed is commenced at a maximum of 10kcal/kg	Audit annually	Band 7 Senior Specialist Renal Dietitian	Annually	To report to Nephrology and Nutrition and Dietetics
The feed is built up as per protocol	Audit annually	Band 7 Senior Specialist Renal Dietitian	Annually	To report to Nephrology and Nutrition and Dietetics
Relevant biochemistry is checked by medical staff and supplemented accordingly	Audit annually	Band 7 Senior Specialist Renal Dietitian	Annually	To report to Nephrology and Nutrition and Dietetics
Thiamine and vitamin B co strong is given as required	Audit annually	Band 7 Senior Specialist Renal Dietitian	Annually	To report to Nephrology and Nutrition and Dietetics

5. Supporting References

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6. Key Words

Renal Nasogastric, renal NG, feeding, re-feeding, refeeding, out of hours, enteral, renal, emergency

CONTACT AND REVIEW DETAILS	
Guideline Lead (Name and Title) Aileen Case, Senior Specialist Renal Dietitian	Executive Lead Andrew Furlong, Medical Director
Details of Changes made during review:	
September 2017 Update of guideline included changing of referral system to ICE, clarification of responsibilities and who this guideline applies to. References updated and reference made to critical care guideline. Statement regarding vegan suitability added and product names updated. Allergy information updated. Change to be in line with the enteral feeding guideline for adults in UHL.	
January 2019	
No changes made.	

1. Summary

- 1.1 Re-feeding syndrome is defined as severe fluid and electrolyte shifts and metabolic complications resulting in decreased plasma levels of phosphate, potassium and magnesium. Feeding without adequate thiamine can lead to Wernickes Encephalopathy.
- 1.2 Medical staff should use this information to assess if the patient is at risk of re-feeding problems or not. N.B. any inpatient who has had very little or no food for > 5 days is at some risk of re-feeding problems. (Mehanna et al 2008)
- 1.3 **Medical staff should assess re-feeding risk, see appendix 3** if patients are not at risk of re-feeding problems ask registered nurse to commence nasogastric tube feed as per flow chart. Thiamine and Vitamin B co – strong would not be required in this case. Copies of the flow charts for individual patients are available by printing out the appendices.

2. Re-feeding Problems - Background

- 2.1 The definition of re-feeding syndrome is severe fluid and electrolyte shifts and related metabolic complications in malnourished patients undergoing re-feeding (Solomon et al 1990). It was first identified after the Second World War when prisoners of war were re-fed after prolonged starvation and suffered cardiac insufficiency, neurological complications, peripheral oedema, hypertension and death (Solomon et a 1990, Melchoir 1998).
- 2.2 In starvation, synthesis of insulin is reduced, and glucagon levels rise. This results in changes in the production of glucose from carbohydrate and an increase in protein and lipid breakdown. Patients who are starved, break down lean body mass, and become depleted in water and minerals (Nightingale 2001).
- 2.3 During re-feeding, metabolism is switched from lipid back to carbohydrate. Insulin is released, and there is an increased uptake of glucose, phosphorous, potassium, and water into the cells and protein is synthesised. Thiamine is an essential co-enzyme in carbohydrate metabolism and feeding without sufficient body stores of this vitamin can lead to Wernicke's encephalopathy definitions.
- 2.4 Re-feeding problems encompass life-threatening acute micronutrient deficiencies, fluid and electrolyte imbalance, and disturbance of organ function and metabolic regulation that may result from over-rapid or unbalanced nutrition support. They can occur in any severely malnourished individuals but are particularly common in those who have had very little or no food intake, even including overweight patients who have eaten nothing for protracted periods.
 - a) The problems arise because starvation causes adaptive reductions in cellular activity and organ function accompanied by micronutrient, mineral and electrolyte deficiencies. Abnormalities in malnourished individuals may, therefore, include: deficiencies of vitamins and trace elements;
 - b) whole body depletion of intracellular potassium, magnesium and phosphate;
 - c) increased intracellular and whole body sodium and water;
 - d) low insulin levels and a partial switch from carbohydrate metabolism to ketone metabolism to provide energy;
 - e) impaired cardiac and renal reserve with less ability to excrete an excess salt and water load.
 - f) abnormalities of liver function.
- 2.5 Giving nutrients and fluid to malnourished patients will reverse these changes but in doing so leads to an increase in demands for electrolytes and micronutrients, and a simultaneous shift of sodium and water out of cells. Over-rapid or unbalanced nutrition support can, therefore, precipitate acute micronutrients deficiencies and dangerous changes in fluid and electrolyte balance.

- 2.6 Enteral tube feeding can precipitate re-feeding problems since excessive feeding levels can be achieved easily. The problem can also be exaggerated if the products do not include adequate vitamins, phosphate or electrolytes.
- 2.7 Provision of intravenous fluids containing glucose may also precipitate re-feeding problems
- 2.8 The two widely recognized problems of re-feeding are those of the classical “Re-Feeding Syndrome” and the “Wernicke-Korsakoff Syndrome”. Since the nature of re-feeding precludes randomised trials of treatment, recommendations are derived from expert opinion.

Use the flowchart below **before** starting enteral feed to assess the patients food allergy/hypersensitivity status and feed suitability.

If a food allergy/hypersensitivity is known or suspected you need to identify and clarify the suspected or known food allergen(s) with the patient, their relatives or carers.



Check the ingredients listed on the leaflet attached to the pack of enteral feed.



Allergens are identified in bold in the ingredients list – this is **not** a finite list as it only uses the 18 food allergens identified by the EC. For example, patients may have an allergy to pea protein, food preservatives etc. and these may not be listed.

If the patient requires a gluten or lactose free feed, this information should be contained in the leaflet as well.



If in any doubt or the patient requires a more detailed assessment of their food allergy/hypersensitivity status:

**DO NOT START ENTERAL FEED
&
REFER TO YOUR WARD DIETITIAN**

Criteria for Determining Renal Patients Acute Kidney Injury or Chronic Kidney Disease 3-5 at Risk of Developing Re-Feeding Problems

MUST BE COMPLETED BY DOCTOR PRIOR TO ENTERAL FEED

Refer to the procedure to assess the patient before starting an adult enteral feed on an adult inpatient in the full guideline

NHS No: S Number: Surname: First Name: Date of Birth: Or affix Patient ID Label here		Ward: Site:	
Please ensure <u>potassium, bone profile and magnesium</u> levels are checked before completing below			
Patient has <u>one or more</u> of the following: (please circle Yes / No)			
A Malnutrition Universal Screening Tool (MUST) score of 4 or more		YES / NO	
BMI less than 16 kg/m2 See MUST		YES / NO	
Unintentional weight loss greater than 15% within the last 3-6 Months See MUST		YES / NO	
Little or no nutritional intake for more than 10 days		YES / NO	
Low levels of potassium, phosphate or magnesium prior to feeding		YES / NO	
OR patient has <u>two or more</u> of the following: (please circle Yes / No)			
BMI less than 18.5 kg/m2 See MUST		YES / NO	
Unintentional weight loss greater than 10% within the last 3-6 Months See MUST		YES / NO	
Little or no nutritional intake for more than 5 days		YES / NO	
A history of alcohol abuse or drugs including insulin, chemotherapy, antacids or diuretics		YES / NO	
Is patient at risk of developing re-feeding problems		YES / NO	
Use the flowchart on page 2 to check if the patient is considered to be at extreme high risk of refeeding syndrome – if yes, consider starting feed at 5kcal/kg			
If Yes - needs Thiamine and Vitamin B co-strong prescribing and daily bloods including potassium, phosphate and magnesium.			
Note: IV High potency vitamins B and C (Pabrinex®) to be used only if Parenteral route is essential as may cause serious allergic reactions during or shortly after administration			
If No: - Start feeding as per day one, Thiamine and Vitamin B co-strong are not required.			
Completed By (Print Name)		Signature	
Job title	Date	Time	

Starter Procedure for Renal Patients Acute Kidney Injury or Chronic Kidney Disease 3-5 Enteral Feeding – Guidance for Nursing Staff with input from Doctors.

Please refer to the Out of hours Enteral tube feeding (Nasogastric) Starter Regimen for an Adult Inpatient (Including Management of Re-feeding Syndrome) Guidance for Practice (Trust ref: B55/2006)

Surname:	S Number:	Ward:
First Name:	Date of Birth:	Site:
Prior to starting the feed:		
<p>a) Confirm Doctor has completed the assessment of re-feeding risk (Appendix 3) and the form is filed in the patient's case notes.</p> <p>b) Check Nasogastric Tube is in correct place as per UHL Policy (Trust Ref B39/2005).</p> <p>c) Discuss patient Hydration needs with Medical staff as regimen may not meet fluid requirements, patient must be placed on a fluid balance chart.</p> <p>d) Consider hydration state and take into consideration oedema or fluid over load to estimate dry weight</p> <p>e) Refer to Dietitian for nutritional assessment and advice via ICE.</p> <p>f) Nutrison™ Concentrated is not suitable for patients with soya, pea protein allergy or cow's milk protein allergy. Please refer to the full guidelines for more detail.</p> <p>g) Nutrison™ Concentrated feed is gluten and lactose free so is suitable for patients with coeliac disease or lactose intolerance.</p> <p>h) Nutrison™ Concentrated is a 2kcal/ml enteral feed.</p>		
Day 1		Please tick and initial
Doctors to check blood U&Es , bone profile and Magnesium levels to determine re-feeding risk, and correct if low		
Check thiamine, vitamin B-co-strong, or Pabrinex, and a balanced multivitamin/trace element supplement have been prescribed and given if at risk of re-feeding problem (see section 3.3). Follow the IV Monograph for Pabrinex. If not prescribed, discuss with the Medical team.		
Flush NG tube with 30 mls sterile water after confirming gastric placement		
Doctors to prescribe Nutrison™ Concentrated feed at 5ml/kg for 20 hours		
Check for nausea, vomiting, abdominal distension and diarrhoea – if present, discuss and ask Medical team to review and consider prokinetics		
Flush NG tube with 30ml sterile water		
Rest from feed for 4 hours		
If not tolerated discuss with medical team before restarting feed		
Day 2		
Doctors to check bloods if re-feeding risk, correct low potassium, phosphate or magnesium		
Flush NG tube with 30 mls sterile water after confirming gastric placement		
Doctors to prescribe Nutrison Concentrated feed at 6ml/kg for 20 hours		
Flush NG tube with 30ml sterile water		
Rest from feed for 4 hours		
If not tolerated discuss with medical team before starting Day 3		
Day 3		
Doctors to check bloods if re-feeding risk, correct low potassium, phosphate or magnesium		
Flush NG tube with 30 mls sterile water after confirming gastric placement		
Doctors to prescribe Nutrison Concentrated feed at 8ml/hr for 20 hours		
Rest from feed for 4 hours continue with Day 3 until reviewed by Dietitian		
Important to Note:		
<p>Ensure the tube is flushed with 30 ml sterile Nutrison sterile water from BD 50ml catheter tip syringe before and after each feed and medication</p> <p>For patients with Diabetes please refer to the 'Diabetes Decision Support Tool' for guidance http://insitetogether.uhl-tr.nhs.uk/Divisions/Corporate/CommunicationsandExternalRelations/Documents/CM/HIGGINS_ManagementofHyperglycaemiaHCBGDiabetes_21811605.pdf</p> <p>If there are any concerns, you should contact your 'In Reach Diabetes Team'.</p>		