

**Consensus Document:
Recommended Investigations &
Management of gastro-oesophageal
reflux and related feeding difficulties**

Departments of

**Dietetics
&
Gastroenterology Team
&
Speech & Language Therapy (SLT)**

**Red Cross Children's & Tygerberg
Hospital**

Definitions

| | |
|------------------------------------|---|
| 1. Mild Reflux Symptoms | <ul style="list-style-type: none"> Clinical symptoms of GOR e.g. vomiting without growth faltering. |
| 2. Moderate Reflux Symptoms | <ul style="list-style-type: none"> In or outpatients with confirmed GOR [normal swallow] weight faltering, oesophagitis or respiratory symptoms on full medical management. In or outpatients with confirmed GOR [abnormal swallow], oesophagitis or respiratory symptoms or weight faltering on full medical management. |
| 3. Severe Reflux Symptoms | <ul style="list-style-type: none"> In or outpatients with confirmed GOR [normal swallow] weight failing [crossing centiles], oesophagitis or respiratory symptoms on full medical management. In or outpatients with confirmed GOR [abnormal swallow], oesophagitis or respiratory symptoms or weight failing [crossing centiles] on full medical management. |
| 4. Abnormal Swallow | <ul style="list-style-type: none"> Difficulties in oral and or pharyngeal phase of swallowing resulting in aspiration and or inadequate oral intake. |

Potential Side Effects

| | |
|---------------------------------------|--|
| 5. Omeprazole | <p><i>Refer to medical practitioner if caregiver complains of increased patient:</i></p> <ul style="list-style-type: none"> Irritability Discomfort <p><i>Intervention:</i></p> <ul style="list-style-type: none"> Consider alternative medication. |
| 6. AR Milk & Thick 'n Easy | <p><i>Transient side effects on commencing feed/ thickener of:</i></p> <ul style="list-style-type: none"> Diarrhoea Constipation Flatulence Abdominal distention <p><i>Intervention:</i></p> <ul style="list-style-type: none"> None normally required Review 1 week |

Referral Patterns:

- | |
|--|
| <ol style="list-style-type: none"> Uncomplicated GOR manage at Level 1 and 2 Centres. Complicated GORD manage at Level 3 centres. NB: Most patients encountered with GOR will have an uncomplicated course. |
|--|

Summary of GOR Recommendations

Phase 1

1. Parental reassurance.
2. Positioning

Mild to Moderate Reflux

3. AR formula < regurgitation (but not reflux)
4. Follow up and reassure

Phase 2

Hospitalized Patients

Severe Reflux

5. *Hospitalized patients with confirmed GOR [normal swallow] weight failing on full medical management:*
 - AR Milk and if symptoms persist change to
 - Thickened feeds using Thick n' Easy to syrup consistency.
 - Omeprazole: daily dose early morning before feeds; consider bd if night time coughing/ wheezing
6. *Hospitalized patients with confirmed GOR [abnormal swallow] weight failing on full medical management:*
 - Thickened feeds using Thick n' Easy to individual consistency as determined by SLT.
 - Omeprazole: daily dose early morning before feeds; consider bd if night time coughing/ wheezing

Out Patients

Severe Reflux

7. *Outpatients with confirmed GOR [normal swallow] weight failing on full medical management:*
 - Referral to NSP Scheme for appropriate AR Milk via CHC/ Day Hospital
 - Omeprazole: daily dose early morning before feeds; consider bd if night time coughing/ wheezing

8. *Outpatients with confirmed GOR [abnormal swallow] weight failing on full medical management:*
 - Referral to NSP Scheme for appropriate First Foods Rice cereal via CHC/ Day Hospital
 - < 12 months wheat free [Dietetic/ Speech Language Therapy (SLT) referral only]
 - Omeprazole: daily dose early morning before feeds; consider bd if night time coughing/ wheezing

Phase 3

9. **Investigation for dysmotility disorder**
 - Milk scan to assess oesophageal dysmotility and gastric emptying.

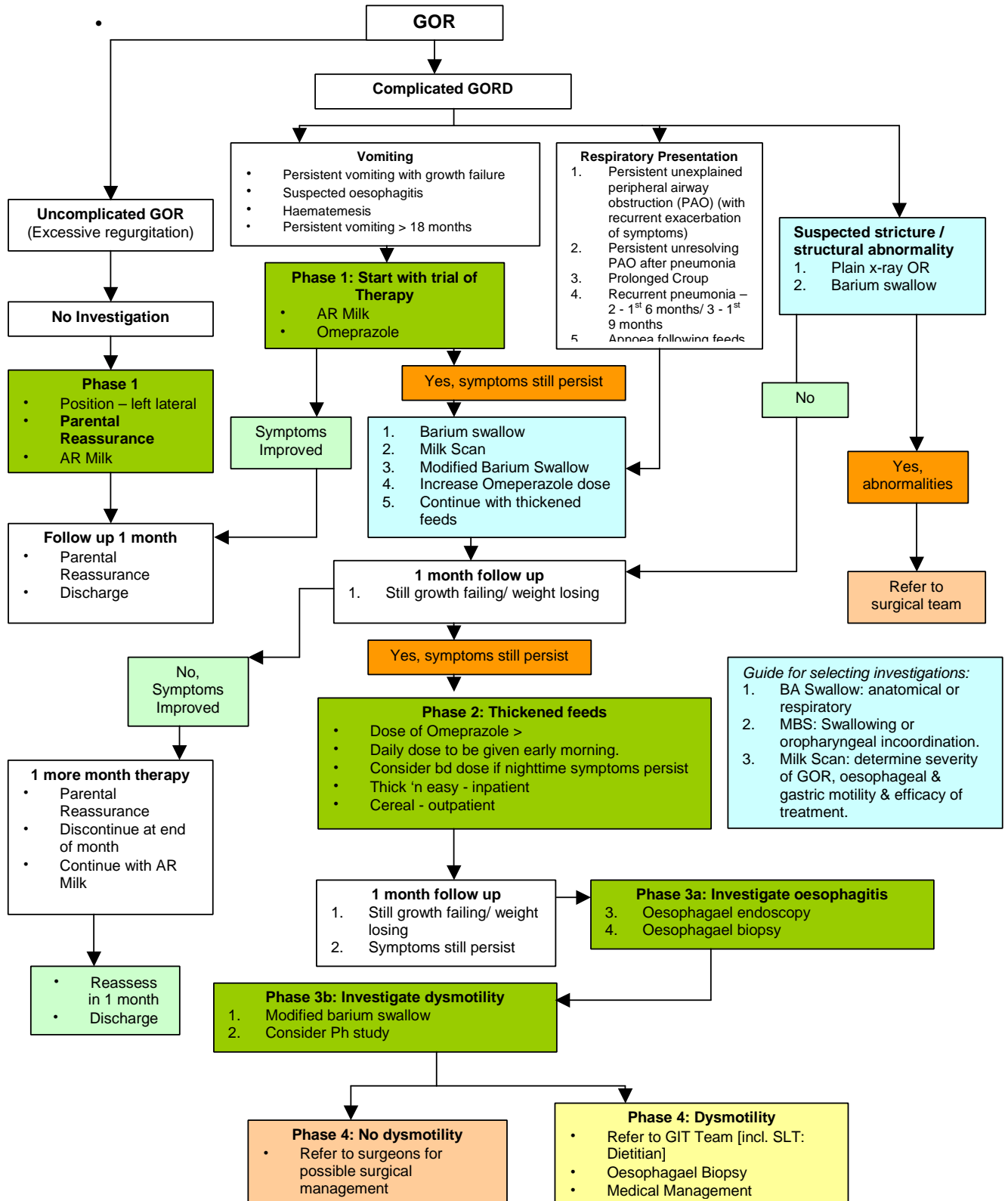
Phase 4

1. **No Dysmotility: Refer to Surgeons**
 - Surgery
 - Fundoplication
 - Gastrostomy

2. **Dysmotility: Refer GIT Team**
 - Oesophageal biopsy
 - Medical Management

Establishing which patients require thickened feeds

Goal: To ensure that each patient who has proven GORD meets the following criteria for thickened feeds



Introduction

The aim of this document is to provide the reader with a guide as to which category of patient with feeding difficulties, dysphagia and or gastro-oesophageal reflux (GOR) would benefit from thickened feeds. Each case should be considered on individual merit.

The first section of this document will deal with evidence regarding the use of thickened feeds for GOR. It was not within the scope of this document to consider the various pharmacotherapies currently used for the treatment of GOR.

Gastro-oesophageal Reflux

Factors influencing gastric acid secretion

The acid content of the stomach is mediated through endocrine, neuroendocrine and paracrine pathways. The stimulus for acid secretion is food. Three phases of acid secretion are cephalic, gastric and intestinal. The cephalic phase is associated with smell, thought, sight and taste which can all stimulate the release of acid. The gastric phase occurs through gastric distention and chemical effectors e.g. amino acids. The intestinal phase is associated with distention in addition to the products of protein digestion.³

Feedback loops prevent post prandial hypersecretion of acid. When acid levels drop below a pH of 3 somatostatin is released, which through a series of mechanisms, inhibits acid secretion from parietal cells. The presence of chyle in the small bowel triggers the release of numerous circulatory inhibitory peptides, which assist with the regulation of gastric acid production.³

What is GOR?

Physiological reflux in infants occurs more frequently when compared to adults with as many as 73 episodes of reflux per day being normal. Mild to moderate regurgitation during or post feeding in infants is not uncommon and usually occurs when the lower oesophageal sphincter (LOS) adapts inadequately to changes in abdominal pressure. This is generally transient and relatively harmless. Usually in the absence of other significant clinical findings the child does not require any diagnostic work up or dietary intervention.^{2,6,7}

GORD occurs when there is inappropriate opening of the LOS resulting in gastric contents being released into the oesophagus and possibly up to the oropharynx producing symptoms or complications.¹

Symptoms of GORD are variable but are normally associated with vomiting, possetting and or regurgitation. Other manifestations include haematemesis, failure to thrive, food refusal and aversion, oesophagitis, painful swallowing, irritability, disturbed sleep, respiratory symptoms, lower airway obstruction, wheezing, apnoeas, recurrent oxygen desaturation and bradycardias. However, none of these signs and symptoms are sensitive or particularly specific to GOR.^{8,14}

GOR is usually self-limiting resolving by the age of 2 years coinciding with developmental maturity.⁸ However, the majority resolve by the age of 1 year.

Factors affecting GOR

Work considering the effect of feed type on reflux indicates that acid reflux was greater in those infants who were breastfed compared to those receiving infant formula. Breast milk is more rapidly emptied from the stomach affecting the ability of the feed to buffer the gastric acidity creating an environment in which acid reflux is more likely.⁶

Infant positioning also contributes to reflux. Prone positioning may reduce reflux episodes in a quarter of patients, but because of the increased risk of sudden infant death syndrome (SIDS) is not recommended.^{6,8} Work has also demonstrated that

placing patients in a left lateral position has a similar effect to prone feeding. Sleep state also impacts on reflux with less episodes occurring as the neonate's sleep state changed from wakefulness, active sleep, indeterminate sleep to quiet sleep. Table 1 identifies other factors, which affect gastroesophageal reflux.⁶

Acid suppressants alkalinize stomach contents but do not stop reflux of contents and antacids are associated with increased risk of aluminium toxicity. Surgical management in the form of funduplications carry their own risk and are not always successful.⁸

| | |
|----------------------------|--|
| Motility | <ul style="list-style-type: none"> • Oesophageal peristalsis • Sphincter pressure • Sphincter relaxation • Gastric accommodation • Gastric emptying |
| Gastric Acidity | <ul style="list-style-type: none"> • Acid secretion • Feed buffering |
| Drug Therapy | <ul style="list-style-type: none"> • Xanthines • Theophyllin (Aminophyllin) • Caffeine |
| Feeding regimen | <ul style="list-style-type: none"> • Type • Fortifiers • Frequency • Volume • Method & route of administration |
| Posture/ handling | <ul style="list-style-type: none"> • Sleep state • Lateral feeding |
| Respiratory disease | <ul style="list-style-type: none"> • Ventilation • Chronic lung disease/ broncho pulmonary dysplasia |
| Other factors | <ul style="list-style-type: none"> • Some Allergies, • Overweight, • Constipation, • Exposure to second-hand tobacco smoking. |

Diagnosis of GORD

Although there is no consensus regarding a “gold standard” for the investigation of GORD, common modalities include barium swallow, (which considers a snap shot in time defining anatomical abnormalities); manometry and scintigraphy/ radionucleide milk scans (detecting pulmonary aspiration), pH studies, upper gastrointestinal endoscopy and oesophageal biopsy (which consider end points of GOR such as inflammation).

Some centres gravitate towards the measurement of acid reflux (although not alkalinity) into the oesophagus via a pH probe. Measurements are taken based on percentage of reflux time with pH < 4 (reflux index), frequency and duration of episodes.

Work suggests that alkaline reflux may also be damaging to the oesophagus, which can be detected using a milk scan. A milk scan is able to measure GOR, gastric emptying time and aspiration. PH studies however, do not detect alkaline reflux as it is only acid sensitive. A barium swallow may demonstrate reflux, but only as a

snapshot in time and does not measure the severity of GOR. Newer measures using impedance are proving to provide reliable results replacing previous “gold” standards”.

Prevalence of GORD

Figures based on pH-metry indicate that more than 85% of premature infants have GOR, of which 3% - 10% have supraoesophageal or extraoesophageal manifestations of GOR such as apnoea, bradycardia and or a worsening of bronchopulmonary dysplasia.⁵

As many as 100% of infants aged 3 months have GOR, of these receive medical attention and in 80% of cases the condition appears to resolve with minimal intervention and diagnostic intervention. At 6 months of age 20 – 40% of infants have GOR and at 12 months 20% if infants have GOR based on history. Erosive oesophagitis is rare in thriving infants who are < 1 – 2 years of age. When it occurs there is occasional vomiting but no underlying disease. However, in those children with neurological sequelae or other systemic conditions there is an often-reported incidence of erosive oesophagitis in 20 – 70% of children age 3 – 4 years.⁵

Adult studies indicate that paediatric populations at risk of developing Barrett’s oesophagus include those with neurological injury/ disease, cystic fibrosis, premature infants with bronchopulmonary dysplasia, upper gastrointestinal tract congenital abnormalities e.g. oesophageal atresia and those with no response to fundoplication.⁵

What outcome measures are needed to assess GORD in children?

A NASPHGAN committee identified the need to determine potential outcome measures to be used in studies of GOR in infants, children and adolescents. It is important that the aetiology of the GOR be defined. The group identified six conditions for which entry criteria and end point variables need to be defined.⁴

The following outcome measures listed below have been suggested as potential endpoints for GORD in infants, children and adolescents.⁴

Asthma/ Reactive Airway Disease

- Pulmonary symptom assessment,
- Health care utilisation,
- Medication utilization,
- Functional status (quality of life (QOL), school performance)
- Pulmonary function tests (change in peak flow)
- Endoscopy & biopsy baseline
- PH metry (baseline & outcome)⁴

Oesophagitis/ Heartburn (GI)

- Symptoms assessment (validated, reproducible, clinical correlates, entry and outcome)
- Functional status (QOL, school performance, entry and outcome)
- Endoscopy & biopsy baseline
- PH metry (baseline & outcome)⁴

Laryngeal/ Tracheal Disease (ENT)

- Symptom assessment (hoarseness, stridor, chronic cough, entry & end point)

- Functional status (QOL, school performance, entry and outcome)
- ENT: direct flexible laryngoscopy and biopsy (entry & end point)
- Voice analysis (entry and endpoint)
- Endoscopy & biopsy baseline
- PH metry (triple probe baseline & outcome)⁴

Neonates

- Symptoms assessment (entry & endpoint)
- Stress ulceration (stomach & oesophagus) – evidence of GI bleeding
- Feeding intolerance
- Apnoea/ bradycardia
- PH metry (triple probe baseline & outcome)⁴

Neurological Injury

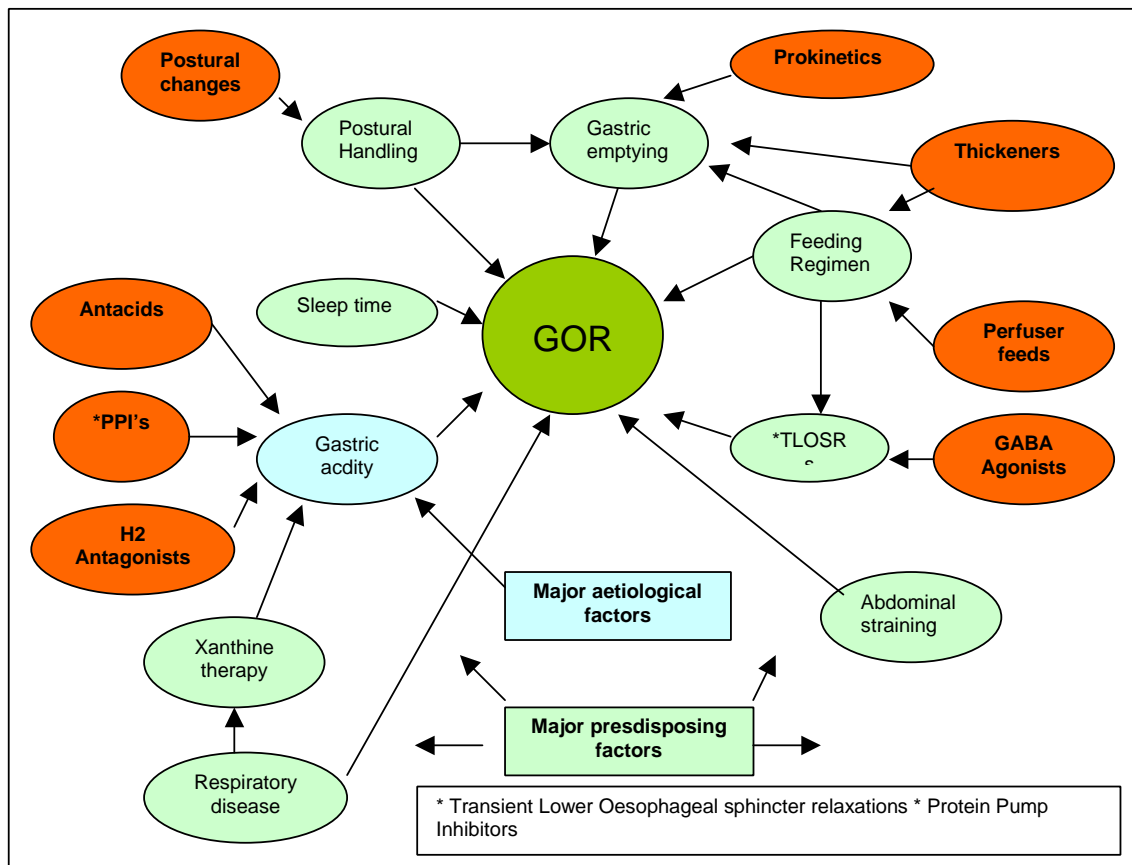
- Currently more characterised entry criteria & outcomes – but more definition still required
- Endoscopy & biopsy baseline
- Dosing requirements for resolution of endoscopic diseases⁴

Failure to thrive/ feeding difficulties

- Symptom assessment
- Functional status
- Physical exam including anthropometrics
- pH metry (entry & endpoint)⁴

Figure 2 outlines current and potential therapies for the treatment of GORD.

Figure 2: Current & newer antireflux therapies and the reflux mechanism they might influence.



Anti-reflux or antiregurgitation milk products for infants and young children

Thickened Feeds

Thickened feeds have been used in the treatment of GOR for almost 50 years. The rationale for the therapy lies with the belief that feeds which are thickened have increased weight or “stickiness” which assists with gastric retention of the contents thereby preventing regurgitation into the oesophagus. However, this does not take into account the associated delay in gastric emptying due to the increased caloric density and viscosity, which is directly correlated with an increase in GOR and increased risk of oesophagitis.⁸

Crossover studies showed that thickened feeds may also lead to an increase in coughing episodes. In addition to this physiological results provide even less convincing data regarding the efficacy of thickened feeds for example manometry studies indicate an increased transient lower oesophageal sphincter relaxations (TLSOR) with worsening of GOR using thickened feeds.⁸

Neonates, especially those with premobid predisposition to bowel disease such as hirschsprungs or cystic fibrosis, may be at greater risk of bowel obstruction from thickened feed, especially thickeners from pectin or cellulose sources. Some of the gum derivatives have been associated with abdominal pain, colic and diarrhoea as a result of fermentation occurring in the large bowel.⁸

Milk products, which are thickened, may include starch and other non-digestible carbohydrates or even casein alone as a protein source compared to a normal casein/ whey combination. All thickening agents used are designed to decrease symptoms by creating more viscous gastric contents.⁷

In addition to this anti-reflux infant formulae designed for use by the general public have recently been evaluated by an ESPHAGAN committee. Recommendations include seeking pharmacological treatment for pathological GOR and importantly to distinguish GOR occurring secondary to other medical conditions.⁷

From clinical experience (experiential) thickened feeds appear to decrease the incidence of moderate regurgitation resulting in a decrease in the number of nutrients being lost in severe cases of failure to thrive, however cognisance should also be taken of their potentially adverse nutritional side effects.⁷

Work regarding some of the thickening agents such guar gum, carob bean gum and soybean polysaccharides have potential side effects of decreasing intestinal absorption of carbohydrates, fats, calcium, iron, zinc and copper. There may also be instances where the metabolic utilisation of dietary substrates occurs with alterations of mucosal and endocrine responses resulting in growth retardation.⁷

Allergic reactions have also been noted in some cases especially with use of thickeners containing carob bean gum. Casein also appears to confer no additional benefits and in addition to this the use of casein containing products due to high protein content may also result in amino acid imbalances when compared to breastmilk and or whey/casein products.⁷

Recommendations for the use of thickened feeds in GOR

ESPHGAN recommends that thickened feeds should only be used in those infants with pathologically recognised regurgitation associated with failure to thrive following a definitive and accurate diagnosis of GORD and should be used in conjunction with appropriate medical/ pharmacological therapy under supervision.⁷

A Cochrane review on the subject does not recommend the use of thickeners in the neonatal population in lieu of sufficient evidence to indicate otherwise. They recommend a randomised clinical controlled trial in the neonatal population to determine the effectiveness of thickeners in the neonatal population.⁸

Consistency of Thickened Feeds

Recommendations in the literature as to the degree of formula thickening are not precise and vary accordingly e.g. some used apple juice, others use formula and rice based thickeners and the remainder used carob. One recommendation is that 1 tablespoon of rice cereal per 25ml of fluid is added however using this recipe there is noticeable thickening of infant formula to a porridge consistency. Other recommendations include 1 – 3g/ 100ml of various thickeners including Thick n' Easy. For very young infants highly thickened feeds may result in inability to ingest adequate volumes from a spoon or infant feeder. Conversely thickening of formula for older infants may result in the delivery of too many kcal.¹⁰

Where there is a concern regarding failure to thrive a starch based thickener such as Thick 'n Easy will provide necessary additional calories. It is recommended that the lowest amount of thickener be added initially and the amount increased gradually to the maximum level, according to patient's actual weight, should there be no resolution of symptoms. A speech and language therapist (SLT) or dietitian will recommend the appropriate teat or feeding utensil. Ordinary cornflour is *not* recommended, as it requires cooking.¹ *Appendix 1 & 2* contain a decision algorithm regarding the use of thickened feeds at RXH.

Anti reflux Milk for Regurgitation

Anti reflux (AR) milks are anti regurgitation nutritionally complete pre-thickened formula which contain a variety of thickening agents. There is currently only one AR infant formula manufactured in South Africa e.g. Infacare AR. AR milk is available in large retail outlets.

AR milk commonly contains carob bean gum with a maximum of 2g/100ml of starch. To avoid lumps forming it should be made with cooled boiled water. The bottle should then be rolled between the hands to ensure proper mixing. The viscosity of the feed will increase when exposed to the acid pH of the stomach.

Prior to discharge the caregiver of all weight failing children with confirmed GOR will be given a referral to the NSP Scheme for ongoing nutrition product support. All patients qualifying for thickened feeds should be assessed at the Dietetic and Speech Therapy reflux clinic [Appendix 5 & 6].

The AR formula is nutritionally complete and has the following nutrition profile:

- Designed around ESPGHAN recommendations.
- Contains Long Chain Polyunsaturated Fats

- Sucrose free.
- Contains less fat and more carbohydrate than a standard infant formula promoting increased gastric emptying.
- Thickened with carob bean gum.
- 100ml contains 67kcal or 0.67kcal/ml the same as a standard infant formula.
- 100ml contains 1.7g protein the same as a standard infant formula.

Using Starter cereals versus First Food cereals to thicken feeds

It is recommended when the use of AR milk is not appropriate and where there are swallowing difficulties. Starter Foods Rice or Maize cereals for infants 4 months and younger should be used, within the context of discharge home recipes, as these are wheat free.¹³ Other rice or maize cereals are wheat containing.

Nutrition Composition per 100g

- Calories: 380kcal
- Protein: 5.8g
- Carbohydrates: 73g
- Fat: 9g
- Sodium: 333mg

Appendix 3 has mixing instructions for the use of Starter Food Rice/ Maize Cereal.

Thick 'n Easy for thickening feeds

Thick 'n Easy is a modified maize starch and is gluten and lactose free. Recommendations for thickening are 1 – 3g per 100ml providing 4 – 12kcal additional.

The nutrition composition per 100g is as follows:

- Calories: 400kcal
- Protein: 0g
- Carbohydrates: 90g
- Fat: 0g
- Sodium: 111mg

Thick 'n Easy will be used at ward level in those patients who require a thickened feed as per the algorithm which will be added to the appropriate ready to use/ hang infant formula such as Infatrini. It is recommended that 1 to 3g of Thick 'n Easy be used to thicken standard dilution ready to use feeds.

Thick 'n Easy should be mixed into liquid using a fork or whisk. A spoon does not allow for sufficient dispersal of the product leading to inferior thickening. If it is a milk-based product, it should be whisked before adding the product to prevent lumps from forming. The optimum consistency is achieved 1 minute after adding the product. If additional product is added to change the consistency before the minute standing time has passed, it will result in a much thicker product than required. Thick 'n Easy thickens to a point, and unlike cereals, doesn't continue to thicken.

To thicken medication, Thick 'n Easy can be mixed into a paste with a little water. This will make it easier to disperse the thickener within the solution. It will not affect the pH of the medication.

Thick 'n Easy may be added to hot or cold water without affecting the flavour. There is no dosage maximum and once swallowed the starch is quickly digested. Food/ liquids can be frozen and defrosted without the presentation or consistency being affected. *Appendix 3* has mixing instructions for the use of Thick 'n Easy.

Thick 'n Easy also has the benefit of being fat and protein free, aiding rapid digestion, and is low in sodium when compared to starter Rice/ Maize cereal.

Prior to discharge the caregiver will practice giving Infacare AR milk and discharge advice will be given around the preparation of Infacare AR milk at home.

Conclusion for Thickened Feeds

There is a large body of conflicting evidence for the use of thickened feeds in the treatment of GOR in infants.^{7,8} As a way forward we have recommended treatment modalities based on the following, as recommended by recent literature:

- The need to define the type of thickener and or thickened formula to be used.
- The need to define entry and exit criteria for thickened feeds based on clinical signs.
- Thickened feeds or formula should only be used under clinical supervision following parental reassurance and advice.

The flow diagram in *appendix 1& 2* outlines the decision making process regarding products and patient inclusion.

Swallowing difficulties / dysphagia

What is dysphagia? Impaired swallowing due to oral, pharyngeal or oesophageal dysfunction.

Normal swallowing

The swallowing process is universally described in three phases, namely: oral, pharyngeal and oesophageal phases. A difficulty in any phase may result in swallowing or feeding difficulties.

1. The oral phase involves preparing and transporting food for swallowing, and requires good lip closure, jaw and tongue movement, for adequate control and movement of the bolus.
2. The second phase, namely the pharyngeal phase, results in a swallow. The following occur simultaneously:
 - The velum elevates to close off the nasopharynx preventing nasopharyngeal backflow.
 - The larynx elevates and moves anteriorly.
 - Epiglottis flaps down over larynx.
 - Vocal cords adduct to protect airway.
 - The bolus moves through the pharynx and into the oesophagus when the cricopharynx relaxes.
3. The oesophageal phase moves the bolus through the oesophagus by peristalsis. ^{14, 15}

Prevalence of dysphagia in the paediatric population

It is reported that 15-25% of the paediatric population may have some kind of feeding difficulty. This increases to between 40 -70% of the premature population and 80% of infants and children with developmental delay. ^{16, 17}

Dysphagia may have serious sequelae, such as recurrent pneumonias due to related aspiration and failure to thrive, and should therefore be assessed and treated immediately.

Swallowing difficulties (dysphagia)

Problems can occur during any one or a combination of the phases.

- **Oral phase problems:**
These relate to oral motor and oral sensory difficulties, and may include reduced tongue movement, anterior spillage, pooling in the mouth, gagging, reduced sucking, tongue thrust, premature spillage over the base of the tongue.
- **Pharyngeal problems:**
These difficulties relate to problems experienced during the actual swallow response, such as:
 - Nasopharyngeal backflow

- Laryngeal penetration – entry into the laryngeal vestibule above the level of the vocal cords; can be cleared in some patients, but associated with aspiration
- Aspiration – entry of swallowed material below the level of the vocal cords
- Delayed or absent swallow response
- Pooling of material in the pharynx before the swallow
- Residue of material in the pharynx after the swallow
- Reduced pharyngeal motility
- Cricopharyngeal spasm ^{14, 15, 18}

At what point should thickened feeds be given for swallowing difficulties / dysphagia?

Thickening of feeds is widely used as a treatment strategy for adults and children with dysphagia. It may be easier for an individual to control a bolus of thicker consistency, as it is more cohesive. A patient who has documented aspiration on swallowing and presents with clinical respiratory symptoms should have a modified barium swallow to determine swallowing safety of other consistencies before prescribing thickened feeds. The prescribed 'treatment' consistency should be determined to ensure safe swallowing firstly and to optimise developmental oral motor and feeding skills. ^{15, 18}

Modified Barium Swallow

The modified barium swallow (MBS) has demonstrated greater sensitivity in detecting swallowing dysfunction compared to the standard barium swallow. There is a prolonged, more focused, observation of the swallowing mechanism. Research has demonstrated that many patients do not demonstrate abnormal swallowing patterns in the first few swallows, but that swallowing function deteriorates as feeding continues and patients may only demonstrate aspiration after multiple swallows (>1 minute of swallowing). ^{19, 20} The MBS may include assessment using various consistencies, utensils and positions.

The MBS assesses oral-pharyngeal structure, oral function, pharyngeal function, defines motility problems in the oral and pharyngeal phases, documents the presence of aspiration during the study, and more importantly should be able to identify reasons for aspiration, as this has implications for treatment. The MBS therefore provides the therapist with information necessary to make appropriate management and treatment decisions. ¹⁸

It does not replace a standard barium swallow, but is an additional study.

Studies have shown that experienced feeding therapists can predict aspiration of liquids from clinical evaluation with relative accuracy, however the ability to predict the aspiration of solids is unreliable on clinical evaluation alone. ²¹ MBS is therefore useful in determining what consistency a patient can swallow safely. ¹⁸

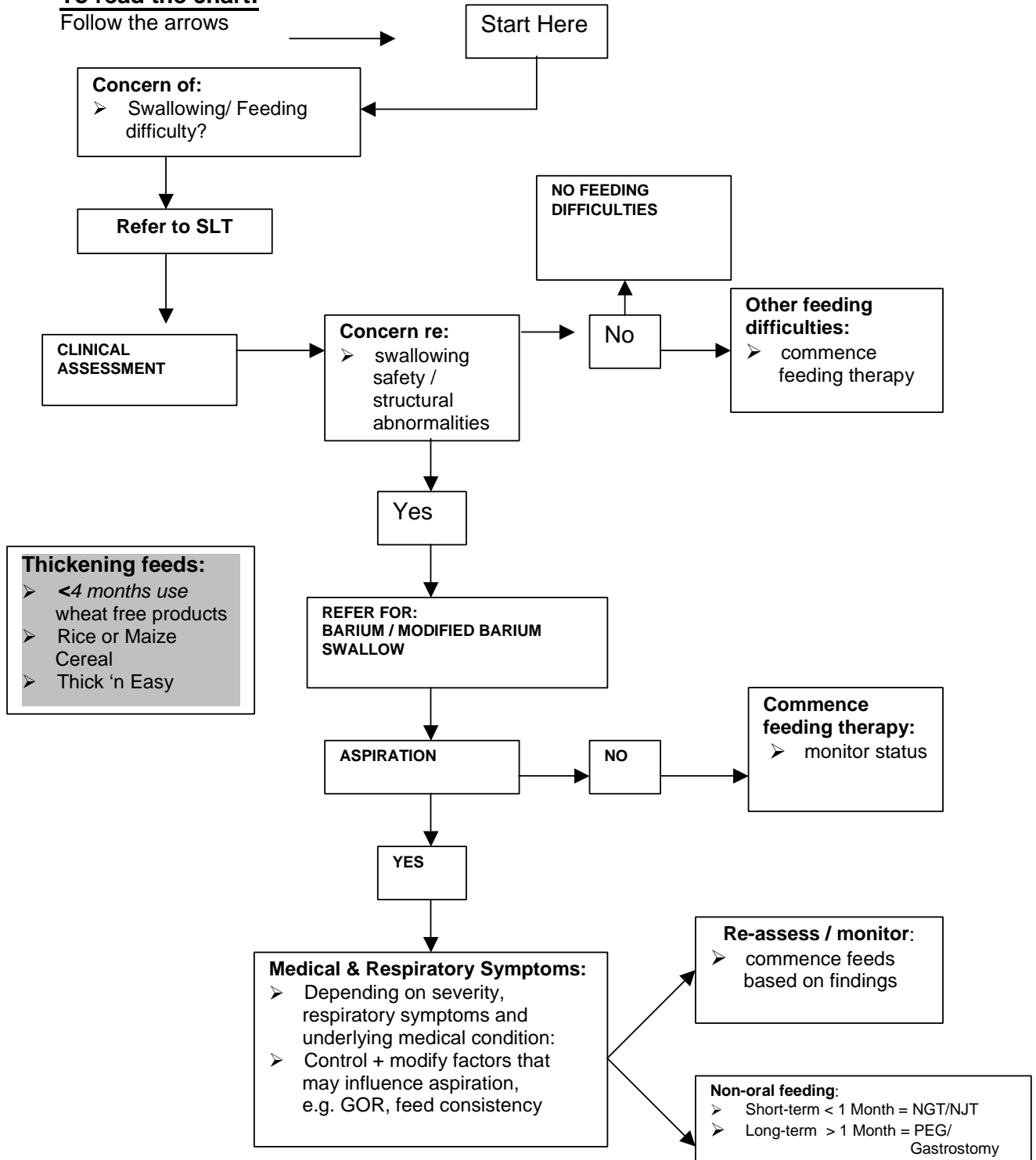
Silent Aspiration may occur, particularly in infants and those with CNS damage. Therefore, clinical evaluation alone cannot necessarily rule out aspiration in a symptomatic patient.

APPENDIX 2:

Goal: Establishing safe treatment for patients with swallowing / feeding difficulties

To read the chart:

Follow the arrows



Appendix 3:

Starter Food Rice/ Maize Cereal Thickening Instructions

Recipe for Starter Food Rice/ Maize

- Add 12 – 15g of Starter Food Rice/ Maize cereal per 100ml of milk to achieve a thickened feed.
- Mix liquid until there are no lumps and feed has thickened.
- It is important to subtract calorie and protein from amount required to meet energy requirements otherwise patient will receive too much energy, protein and sodium.
- Most feeds will end up being energy dense at 1kcal/ml

Nutrition Composition per 100g

- Calories: 380kcal
- Protein: 5.8g
- Carbohydrates: 73g
- Fat: 9g
- Sodium: 333mg

Thick 'n Easy Mixing Instructions

| Thick 'n easy Mixing Recommendations | | | |
|--------------------------------------|----------------|--------------------------|----------------|
| Consistency | | | |
| Clear Liquids e.g. juice | | | |
| ml of liquid | Syrup/ Pouring | Custard/ Thick Milkshake | Pudding/ Solid |
| Number of scoops | | | |
| 25ml | 1/4 [0.25] | 1/3 [0.37] | 0.5 |
| 50ml | 1/2 [0.5] | 3/4 [0.75] | 1 |
| 75ml | 3/4 [0.75] | 1.10] | 1.5 |
| 100ml | 1 [1] | 1.5 | 2 |
| 125ml | 1.25 | 1.9 | 2.5 |
| 150ml | 1.5 | 2.25 | 3 |
| 175ml | 1.75 | 2.5 | 3.5 |
| 200ml | 2 | 3 | 4 |
| 250ml | 2.5 | 5.25 | 5 |

| Thick 'n easy Mixing Recommendations | | | |
|--------------------------------------|----------------|--------------------------|----------------|
| Consistency | | | |
| Full Liquids e.g. milk | | | |
| ml of liquid | Syrup/ Pouring | Custard/ Thick Milkshake | Pudding/ Solid |
| Amount of Thick 'n Easy | | | |
| 25ml | 1/4 [0.25] | 1/3 [0.37] | 0.5 |
| 50ml | 1/2 [0.5] | 3/4 [0.75] | 1 |
| 75ml | 3/4 [0.75] | 1 | 1.5 |
| 100ml | 1 [1] | 1.5 | 2 |
| 125ml | 1.25 | 1.9 | 2.5 |
| 150ml | 1.5 | 2.25 | 3 |
| 175ml | 1.75 | 2.5 | 3.5 |
| 200ml | 2 | 3 | 4 |
| 250ml | 2.5 | 5.25 | 5 |

The nutrition composition per 100g is as follows:

- Calories: 400kcal
- Protein: 0g
- Carbohydrates: 90g
- Fat: 0g
- Sodium: 111mg

Thick 'n Easy Mixing Instructions

- Thick 'n Easy should be mixed into liquid using a fork or whisk,
- A spoon does not allow for sufficient dispersal of the product leading to inferior thickening.
- Milk-based product should be whisked before adding the product to prevent lumps from forming.
- The optimum consistency is achieved 1 minute after adding the product.
- If additional product is added to change the consistency before the minute standing time has passed, it will result in a much thicker product than required.
- To thicken medication, Thick 'n Easy can be mixed into a paste with a little water this will make it easier to disperse the thickener within the solution.

Appendix 4

Nutrition Risk Score

Patients Name
Hospital Name
Date of birth

Ward
Date
Height/ Length

Please circle relevant score. Only select one score from each section. Select the highest score that applies.

COMPLETE ON ADMISSION AND WEEKLY IF PATIENTS CONDITION HAS CHANGED

1

Paediatrics (0-17 years) score

Present Weight

| | |
|--------------------------------------|---|
| Expected weight for length | 0 |
| 90-99% of expected weight for length | 2 |
| 80-89% of expected weight for length | 4 |
| <79% of expected weight for length | 6 |

Adults (18 years) score

Weight loss in last 3 months (unintentional)

| | |
|--------------------|---|
| No weight loss | |
| 0-3kg weight loss | 1 |
| >3-6kg weight loss | 2 |
| >6kg weight loss | 3 |

2

Omit question 2
For paediatrics

BMI (Body Mass Index)

| | |
|--------------|---|
| 20 or more | 0 |
| 18 or 19 | 1 |
| 15-17 | 2 |
| Less than 15 | 3 |

3

Appetite

- Good appetite, manages most of 3 meals/ day (or equivalent) 0
- Poor appetite, poor intake – leaving > half of meals provided (or equivalent) 2
- Appetite nil or virtually nil, unable to eat. NMB (No food for > 4 meals) 3

4

| Ability to eat/ retain food | | |
|------------------------------------|---|---|
| • | No difficulties in eating, able to eat independently No diarrhoea or vomiting | 0 |
| • | Problems handling food e.g. needs special cutlery Vomiting/ frequent regurgitation (or posseting)/ mild diarrhoea | 1 |
| • | Difficulty swallowing, requiring modified consistency. Problems with dentures, affecting food intake. Problems with chewing affecting food intake. Slow to feed. Moderate vomiting and/or diarrhoea (1-2/day children) Needs help with feeding (e.g. physically handicap) | 2 |
| • | Unable to take food orally. Unable to swallow (complete dysphagia) Severe vomiting and/or diarrhoea (>2/ day for children). Malabsorption | 3 |

5

| Stress Factor | | |
|----------------------|---|---|
| • | No stress factor (includes admission for investigations only) | 0 |
| • | Mild Minor surgery. Minor Infection | 1 |
| • | Moderate Chronic disease. Major surgery/ infarctions Fractures. Pressure sore/ ulcers. CVA Inflammatory bowel disease. Other gastrointestinal disease | 2 |
| • | Severe Multiple injuries. Multiple fractures/burns Multiple deep pressure sores/ ulcers Severe sepsis. Carcinoma/ malignant disease | 3 |

Total

Nutrition Risk Score Results

| Score | Action |
|------------------------|--|
| 0 – 3 LOW RISK | NO ACTION NECESSARY Check Weight weekly |
| 4 – 5 Needs Monitoring | Check weight weekly Encourage eating & drinking Replace missed meals with Supplements. (Check with Dietitian if on special diet) Repeat scores after 1 week refer to dietitian if no improvement |
| 6 – 15 High Risk | Refer to dietitian as soon possible |

ALSO REFER TO DIETITIAN IF:

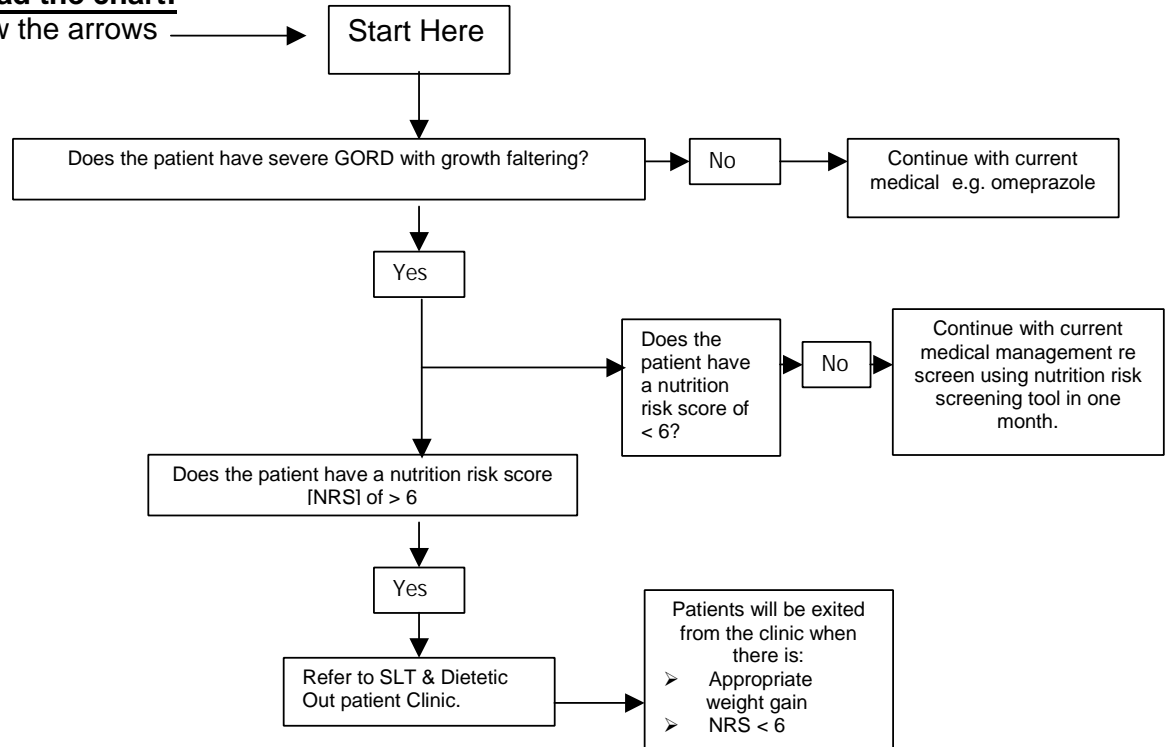
- The patients needs a special diet not available on the normal menu
- The patient needs advice about a special diet

Referral Criteria for SLT & Dietetic Reflux Clinic

Goal: **To ensure that each patient who has proven GORD meets the following criteria for referral to the outpatient SLT & Dietetic Reflux Clinic**

To read the chart:

Follow the arrows



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