

# Guideline for the Management of Gastro-oesophageal Reflux (UHL Neonatal Units)

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## **1. Introduction and who this guideline applies to**

Gastroesophageal reflux (GOR) can be defined as the retrograde passage of gastric contents into the oesophagus. GOR occurs commonly in newborn infants and is more common in premature infants in view of the immature anatomic or impaired physiologic factors that protect against reflux. In some infants it may be associated with symptoms and in certain circumstances treatment could be considered.

This guideline is aimed at all Health Care Professionals involved in the care of infants within the Neonatal Service.

## Key Points

- Gastro-oesophageal reflux should be treated initially with conservative measures (positioning, gravity feeds and low volume feeds)
- Infants 32 weeks CGA and above may receive gaviscon as a first line medication
- Term infants may be treated with a feed thickener such as carobel

## 2. Gastro-oesophageal reflux

### 2.1 When to suspect gastro-oesophageal reflux

The following signs and symptoms may be attributed to GOR in some cases <sup>(2)</sup>.

- Frequent vomiting
- Ruminating movements
- Discomfort during and after feeds - irritability or arching of the back after feeds
- Poor weight gain
- Recurrent aspiration pneumonia
- Apnoeas
- Frequent desaturations and bradycardias
- Exacerbation of respiratory symptoms, including Bronchopulmonary dysplasia (BPD)

**However, it should be noted that GOR may not be the underlying cause of these signs and symptoms, and other causes should be looked for.**

### 2.2 GOR and its relationship to Apnoea, Bronchopulmonary dysplasia (BPD), poor weight gain:

1. Recurrent apnoeic episodes have traditionally been associated with reflux, however a study of premature infants showed that apnoea may reduce the lower oesophageal sphincter tone and may precipitate GOR, rather than the opposite relationship of GOR causing apnoea.<sup>[3]</sup> Therefore, it is important to consider other causes of apnoea along with reflux as multiple studies have failed to demonstrate any temporal association between apnoea and reflux.
2. Bronchopulmonary dysplasia — GOR is said to contribute to the pathogenesis of BPD as it leads to aspiration of gastric contents into the lungs, however there are no studies supporting an association between GOR and BPD <sup>[4,5]</sup>.
3. Poor weight gain — GOR is common in infants with poor weight gain as these infants may take longer to achieve full oral feedings, however there is little evidence that the association is causal <sup>[4,6]</sup>

Please see Appendix 1 for a flowchart regarding the management of GOR. More detailed advice is below.

## 2.3 INITIAL CONSERVATIVE MANAGEMENT (non-pharmacological):

### Position:

Left lateral body positioning has been found to improve symptoms<sup>(8)</sup> (*Grade B evidence*).

### Feeding:

If positioning fails to improve symptoms, consider low volume frequent (up to one hourly) feeds.<sup>(1)</sup> (*NICE guidelines,2015*).

A Cochrane review of gravity vs push feeding did not have enough evidence to give a recommendation on which method is superior<sup>28</sup>, however in the infant population Gravity feeding may be helpful.

## 2.4 Anti-reflux Drug Therapy

### Gaviscon Infant

- Gaviscon has been poorly studied in preterm infants. However, a few studies done on preterm infants have shown that sodium alginate preparations reduce the number of acidic GOR episodes and decrease the frequency of regurgitation and can be used as an alternative to feed thickeners in preterm infants.<sup>(11,12)</sup>
- In current practice, Gaviscon Infant is often used more as a feed thickening agent than antacid. It is said to form a "raft" that floats on the surface of stomach contents.
- As it is a sodium alginate and contains up to 0.92mmol of Na per dose its use should be monitored.
- Prescribe in terms of doses e.g. one dose added to 100mls milk (one dose = half a dual sachet) (BNFc 2019)

### Thickened feeds<sup>(9-12)</sup>

- Feed thickeners like Carobel can be used for uncomplicated GOR in term infants, its use is not studied well and is not advised *in low birth weight and preterm infants*. Also, use of feed thickeners may be challenging in preterm infants with weak oromotor skills or who are mostly fed by tube-feeds.
- It should be noted that the use of thickeners may result in changes to the osmolarity and caloric density of feeds.

### **When not to use feed thickeners and Gaviscon:**

- Both feed thickeners and Gaviscon should be avoided in cases of hypovolemia, diarrhoea or intestinal obstruction.
- As Gaviscon contains sodium, it should be avoided if renal impairment is suspected due added risk of hyponatremia.
- Gaviscon and carobel should never be used concomitantly. (*NICE 2015*)

In a small minority of babies with particularly troublesome and persistent symptoms, a consultant may consider a trial of further pharmacological management. No drug use is without adverse effects; pharmacokinetics and dosing are not well understood and evidence supporting any drug treatment for reflux is extremely limited. It has also been postulated that prolonged gastric acid suppression can lead to bacterial overgrowth in the preterm gastrointestinal tract which in turn is a risk factor for necrotising enterocolitis. The decision to start drug treatment must be made by a consultant.

Based on the evidence available, a trial of the following drugs may be considered for medical management of significant and persistent symptoms that are strongly thought to be related to gastro-oesophageal reflux.

**Omeprazole** <sup>(13-15)</sup>

- Omeprazole is a proton pump inhibitor that appears to be well-tolerated in preterm infants. However; prolonged periods of hypochlorhydria have been seen in neonates. The safety and long-term effects of proton pump inhibitors in infants have not been fully evaluated and it should therefore only be used after careful consideration of the risks and benefits in infants.

**Erythromycin**

- Erythromycin acts as a prokinetic agent in lower doses, increasing antral contractility via motilin receptors and is believed to reduce the potential for reflux in this way. It has been shown to be effective in improving feed tolerance, though study results have been mixed and the relationship between feed intolerance and reflux is unclear.
- It was observed from few studies, that use of erythromycin at higher treatment doses (40 to 50 mg/kg/day) or in infants > 32 weeks' GA reported more positive effects in improving feeding intolerance, but there is insufficient evidence to recommend its use in high or low doses for preterm infants with or at risk of feeding intolerance. <sup>(17)</sup>
- As with other antibiotics, the potential for resistance exists and should be considered before initiating therapy.
- Erythromycin has been associated with the development of pyloric stenosis and therefore long-term treatment should not be used. <sup>(18,19)</sup>

Suggested therapies

> 4 weeks old	< 4weeks old
Erythromycin only (3mg/kg/dose four times a day) (Grade B evidence)	Omeprazole only (700 micrograms/kg once a day starting dose) (Grade B evidence)

(BNFc 2019)

Trial off the therapy should be considered after two weeks of treatment.

### **If symptoms return:**

- 1st line: Conservative measures for one week
- 2<sup>nd</sup> Line: Feed thickeners (carobel or gaviscon)
- 3<sup>rd</sup> line: Omeprazole should be started in addition
- 4<sup>th</sup> line Consider use of erythromycin (should not be used for more than 2 weeks<sup>(18,19)</sup>).
- Any baby receiving medical management for GOR should have their treatment should be reviewed every two weeks.

### **An update on other drugs and strategies occasionally used for treatment of GORD**

1. Ranitidine — Tolerance can develop within 3 days, rebound, possible cardiorespiratory side-effects; less effective than PPIs. Safety concerns about ranitidine use in premature infants include a possible increased risk for necrotizing enterocolitis, which may be related to alterations in the gastric flora due to acid suppression <sup>(20,21)</sup>
2. Jejunal feeds — Cochrane review concludes NJ feeding has more adverse effects than gastric tube feeding <sup>(22)</sup> However if treatment is difficult, NJ feeding, with or without continuous feeding may be considered after consultant review.

### **2.5 Further investigation: Combined pH and impedance monitoring**

In cases where symptoms are resistant to management measures and there is still a clinical suspicion of GOR, further investigation with combined pH and impedance monitoring can be considered after discussion with the consultant.

Multichannel intraluminal impedance (MII) is a procedure for measuring the movement of fluids, solids, and air in the oesophagus. Combined MII and pH recording detects liquid reflux, independent of its pH. It is superior to pH monitoring alone for evaluation of the temporal relation between symptoms and GOR, particularly as in neonates, relatively few gastroesophageal reflux episodes cause oesophageal acidification to pH <4. It can also be used to evaluate symptoms associated with reflux in the presence of acid suppression and can distinguish swallows (antegrade flow) from GOR (retrograde flow).

**Further management should then be discussed with a consultant and may include requesting a surgical opinion**

### **2.6 Differential diagnosis:**

Cow's milk protein intolerance - CMPI may be suspected in these infants despite appropriate management of GOR. There is limited data to support the use of amino acid based or hydrolysed formulas in healthy preterm infants. Hydrolysed formulas have been found to decrease the GI transit time and thus reducing symptoms of GOR in term infants. Although the role of CMPA is unclear in preterm infants with

signs, a trial of extensively hydrolysed protein-based formula may be used in age-appropriate preterm infants with signs of severe reflux (26,27)

### **3. Education and Training**

None

### **4. Monitoring Compliance**

None

### **5. Supporting References**

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## **6. Evidence Criteria**

### **Evidence according to RCPCH**

Grade A	At least 1 randomised controlled trial addressing specific recommendation
Grade B	Well conducted clinical trials but no randomised trial on specific topics
Grade C	Expert committee report or opinions

## **7. Key Words**

Anti-reflux, Feeding, Gastric, NG, NJ, Position, Thickener

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**The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.**

**As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.**



Contact and review details		
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May 2019	Neonatal Guidelines Meeting Neonatal Governance Meeting	(NICE Quality Standard included)
July 2022 - Aug 2022	Neonatal Guidelines Meeting Neonatal Governance Meeting	Format update Added statement re- gravity v's push feeds Consider NJ feeds if treatment is difficult and only after consultant review Flowchart – added gravity feeds to conservative measures treatment

### Appendix 1: Management of Gastro-oesophageal Reflux in Preterm and Term Infants

