

DERBYSHIRE JOINT AREA PRESCRIBING COMMITTEE (JAPC)

Gastro-oesophageal reflux disease: recognition, diagnosis and management in children and young people

Taking personalised approaches is a key approach to provide best care.

- Enabling **choice**, ensures that patients are aware of their options.
- Shared decision making helps patients to make decisions that are right for them.
- Supporting **self-management** increases people's knowledge, skills and confidence to manage their own health and care.
- Giving information in a **health literate** way means that people will understand how to manage their health.

Further information about offering choice, shared decision making and supporting self-care can be found <u>here</u>.

- This guidance is based on NICE NG1 January 2015 Gastro-oesophageal reflux disease: recognition, diagnosis and management in children and young people and also takes into account recommendations from <u>NASPGHAN/ ESPGHAN guidelines on paediatric gastro-oesophageal</u> reflux, 2018 and <u>EAACI position statement on diagnosis and management of food allergy associated</u> gastro-oesophageal reflux disease in young children, 2022.
- Gastro-oesophageal reflux (GOR) is common in infants as they are physiologically predisposed to reflux due to possessing a shorter intra-abdominal oesophagus, they are frequently in the supine or seated position and consume frequent liquid feeds resulting in gastric distension. Normal asymptomatic occurrences seen in infants is noticeable by the effortless regurgitation of feeds. It does not usually need further investigation or treatment.
 - It affects at least 40% of infants by 8 weeks age
 - o may increase to 66% of infants by 4 months of age
 - usually becomes less frequent after 6 months of age and resolves in 90% of affected infants by 1 year of age
 - o regurgitation of feeds can be managed by advising and reassuring parents and carers.
- NICE says that effortless spitting up of one or two mouthfuls is GOR and doesn't require any treatment other than reassurance. Please refer to the algorithms on page 4 and 5 if symptoms are more troublesome.
- Only a small proportion (approx. 5%) suffer from pathological reflux, defined by suffering complications of reflux which have a significant impact on quality of life. This is usually secondary to other conditions such as cow's milk allergy in infancy and will need to be clinically managed as Gastro-Oesophageal Reflux Disease GORD. There may be a risk of pulmonary aspiration or in older children, oesophagitis.
- Do not routinely offer PPIs or H2 antagonists to treat GORD, especially in children under 1 year of age. Pharmacological GORD treatment should only be considered after a cow's milk elimination diet has been trialled without success and GORD has been proven.
- In infants, children and young people with vomiting or regurgitation, look out for the 'red flags' that may require referral (see table 2), which may suggest disorders other than GORD.

- Do not routinely investigate or treat for GOR if an infant or child without overt regurgitation presents with only 1 of the following:
 - o unexplained feeding difficulties (for example, refusing to feed, gagging or choking)
 - o distressed behavior
 - o faltering growth
 - chronic cough hoarseness
 - a single episode of pneumonia
- Do not offer metoclopramide, domperidone or erythromycin to treat GOR(D) unless all the following conditions are met:
 - there is specialist paediatric healthcare professional agreement for its use.
 - o other interventions have been tried
 - the potential benefits outweigh the risk of adverse events

See domperidone position statement

Be aware that some symptoms of a non-IgE-mediated cows' milk allergy (CMA) can be similar to the symptoms of GORD, and is more likely in infants with atopic symptoms, skin rashes, combination of upper and lower gut symptoms and/or a family history of atopy. If a non-IgE-mediated cows' milk allergy is suspected, take an allergy focused clinical history as per <u>JAPC Cow's Milk Allergy In Infants</u> and <u>Children guideline</u>. Refer to a paediatric dietitian if cow's milk allergy is confirmed by resolution of symptoms following cow's milk exclusion and recurrence of symptoms on reintroduction. Note that regurgitation may continue to be an issue despite resolution of other symptoms and the dietitian can usually support the infant without requiring pharmacologic intervention.

Initial management of GOR and GORD

When reassuring parents and carers about regurgitation, advise them that they should return for review if any of the following occur:

- The regurgitation becomes persistently projectile
- There is bile-stained (green or yellow-green) vomiting or haematemesis (blood in vomit)
- There are new concerns, such as signs of marked distress, feeding difficulties or faltering growth.
- There is persistent, frequent regurgitation beyond the first year of life.

See **appendix 2** for first line strategies that should be offered to the family on the management of crying/ irritable and regurgitating infants.

Take a feeding history:

- Ensure the infant is not being overfed check adequate hydration status and growth. Gaining weight excessively suggests overfeeding. If dehydrated/ poor weight gain, this is an indicator of inadequate nutrition as well as increasing the risk of constipation which will exacerbate reflux.
- Refer to a health visitor to undertake a feeding assessment and observation, and advice will be given regarding breastfeeding and bottle-feeding technique, positioning and attachment if indicated.
- Support ongoing breastfeeding as gastric emptying is almost twice as fast in breastfed babies than formula fed, thereby reducing reflux.
- If the baby is formula fed, check that they are taking a whey dominant first stage infant formula [whey to casein ratio of at least 60:40 which is more easily digested (see following website for more information <u>Cow's and goat's milk based infant formula</u>)]. As long as growth velocity is appropriate, ensure the infant is not taking more than 150ml/kg in the first 6 months of life and >120ml/kg from 7-12 months age. Note, premature babies may need more than this. Review preparation methods to ensure not over-concentrating feeds.
- Ask about feed refusal/ restricted intake. Signpost the family to paced bottle feeding information if appropriate; <u>Feeding on demand - Bottle feeding - Start for Life - NHS (www.nhs.uk)</u>.

How to explain to a family why their infant is distressed (and it's not due to acid reflux)



(Adapted from work by Dr Susan Orenstein, 2013). TLESR = Transient Lower Esophageal Sphincter Relaxations

Regurgitation is related to the volume of food ingested – the greater the volume, the longer it sits in the stomach (longer gastric emptying times) leading to higher intragastric pressure and gastric distension, resulting in more relaxations of the lower oesophageal sphincter causing reflux and regurgitation. The crying is caused by volumetric distension (stretching) of the oesophagus (functional heartburn), rather than being caused by pain from acid.

Crying causes i) straining making reflux worse (as does straining from trying to pass a stool/ constipation) ii) ingestion of air and iii) is likely to result in parents offering more feed to comfort them, all of which result in further gastric distension and subsequent reflux.

1. Breast fed infants with regurgitation causing clinical concern



* This would need a referral back to the health visitor within Derbyshire County (DCHS) or Derby City (DHCFT). Referrals to Health Visitors for DCHS should be through the single point of access (SPA) on 01246 515100 in Derbyshire County. For referrals for the Infant Feeding Team in Derby city GPs can either task 'Infant Feeding Advisors' on Systmone or email <u>dhcft.infantfeedingderbycity@nhs.net</u>.

2. Formula-fed infants (0-6 months) with frequent regurgitation associated with marked distress



Note: Do not offer acid suppressing drugs to treat overt regurgitation in infants and children occurring as an isolated symptom.

3. Pharmacological treatment of GORD

PPIs have been shown to have a number of adverse side effects:

- significant impact on selected micronutrient availability linked with increased risk of fractures
- impaired microbiome
- increased risk of infections
- increased risk of developing food allergy

These risks increase with length of use and dose and should be highlighted to families before prescribing. The risk of rebound acid hypersecretion following discontinuation of the PPI should also be considered and discussed and how this should be carefully managed.



* EMA has issued a recommendation of <u>suspension of ranitidine medicines in the EU</u>. See **appendix 3** for further information on alternative H2RA.

Table 1 Detailed prescribing information

Age/weight	Dosing	Notes		
<u>Alginates</u>				
GAVISCON INFANT (See appen	dix 1 for further information)			
Neonate body weight <4.5kg <u>or</u> Child 1-23 month and <4.5kg	1 sachet mixed with feeds (expressed breast milk or minimal water, for breast fed infants) when required	Max 6 sachets in 24 hours		
Neonate body weight >4.5kg <u>or</u> Child 1-23 month and >4.5kg	2 sachets mixed with feeds (expressed breast milk or minimal water, for breast fed infants) when required			
ACIDEX ADVANCE (sodium alginate + potassium hydrogen carbonate)				
Child 2-11 years (under medical advice only)	2.5- 5mls after meals and at bedtime	Suspension		
Child 12-17 years	5-10mls after meals and at bedtime			
Proton pump inhibitors				

'Special' suspensions are usually more expensive, have a short half-life and questionable stability when compared to licensed medicines

LANSOPRAZOLE

- Available as capsules and orodispersible tablets (fast-tabs); Should be taken at least 30 minutes before food
- Not licensed for use in children*; licensed for administration via NG tube
- Dose rounded to the nearest half or quarter of tablet <u>before</u> dispersing in water for oral liquid administration due lack of uniformity once dispersed in water.
- FasTabs (either whole or a proportion) can be placed on the tongue and allowed to disperse before swallowing

* Lansoprazole SPC states 'Treatment of small children below one year of age should be avoided as available data have not shown beneficial effects in the treatment of gastro-oesophageal reflux disease'.

Child body weight under 30kg	0.5mg-1mg/kg (max 15mg) once daily in the morning	Not licensed for use in		
Child body weight under sokg	(Round dose to the nearest quarter tab)	children*		
neonate	-	Consider omeprazole		
2.5-5kg	Starting dose 3.75mg once daily Quarter of a 15			
5-10kg	Starting dose 7.5mg once daily Half of a 15mg			
10-30kg	Starting dose 15mg once daily			
Child body weight > 30kg	15-30mg once daily in the morning			

OMEPRAZOLE

- Available as capsules or dispersible MUPS tablets. Caps and tabs not licensed for use in children except for severe ulcerating reflux oesophagitis in children over 1 year
- **Dispersible gastro-resistant tablets (MUPS)**: <u>Doses can be rounded to the nearest quarter tablet</u> e.g. 2.5mg. The tablet (½, ¼ or ¾) can be mixed in water, fruit juice, apple sauce or yoghurt on a spoon. Please note that fruit juice, apple sauce, yoghurt should not be used in infants under 6 months.
- Do NOT use milk or carbonated water. The division must be done <u>before</u> mixing the tablet as the omeprazole granules do not produce a uniform mixture when dispersed in a liquid. MUPs should not be dispersed in water to draw off a proportion. Try to avoid use of an oral syringe where granules will remain deposited. The enteric coated pellets must not be chewed.
- **Capsules**: for children who can drink or swallow semi-solid food- open the capsule and swallow the contents with half a glass of water or after mixing the contents in a slightly acidic fluid e.g. fruit juice or applesauce, or in non-carbonated water. The enteric coated pellets must not be chewed.
- Licensed omeprazole **oral suspension** is GREY- to be used only when dispersible MUP tablets have been tried and not tolerated or in cases where doses cannot be safely rounded to the nearest quarter tablet. Review ongoing need regularly.

Noonato	700microg/kg once daily for 7-14 days, then increased	
Neonate	if necessary to 1.4mg-2.8mg/kg once daily	
Childron 1 months 2 years	700microg/kg once daily, increased if necessary to	
Cilluleir Thomas-2 years	3mg/kg (max. 20mg) once daily	
<2.5kg	Starting dose 2.5mg once daily	Quarter of a 10mg MUPS tab
2.5-7kg	Starting dose 2.5-5mg once daily	Quarter or half of 10mg MUPS
7-10kg	Starting dose 5mg once daily	Half of a 10mg MUPS tab
Children 2-17 years	10mg once daily increased if necessary to 20mg once Max. 12weeks at	
(body weight 10-19kg)	daily (severe ulcerating reflux oesophagitis)	dose.
Children 2-17 years	ars 20mg once daily increased if necessary to 40mg once Max. 12weeks at	
(body weight ≥20kg)	daily (severe ulcerating reflux oesophagitis)	dose.

Source BNF for children accessed online [16/2/2022]

Table 2 Red flag symptoms suggesting disorders other than GOR(D)

Symptoms and signs	Possible diagnostic implications	Suggested actions			
Gastrointestinal					
Frequent, forceful (projectile) vomiting	May suggest hypertrophic pyloric stenosis in infants up to 2 months old or a symptom of cow's milk allergy.	Refer for same day assessment if clinically unwell, otherwise to rapid access clinic or rule out CMA first - See <u>JAPC Cow's Milk</u> <u>Allergy In Infants and Children</u> <u>guideline.</u>			
Bile-stained (green or yellow-green) vomit	May suggest intestinal obstruction	Refer for urgent same day assessment			
Haematemesis (blood in vomit) with the exception of swallowed blood, for example, following a nosebleed or ingested blood from a cracked nipple in some breast-fed infants	May suggest an important and potentially serious bleed from the oesophagus, stomach or upper gut	Refer for same day assessment if clinically unwell otherwise to rapid access clinic			
Onset of regurgitation and/or vomiting after 6 months old or persisting after 1 year old	Late onset suggests a cause other than reflux, for example a urinary tract infection (also see the <u>NICE Urinary tract infection in under 16s</u> . Persistence suggests an alternative diagnosis	Urine culture investigation and specialist referral as per NICE			
Blood in stool	May suggest a variety of conditions, including bacterial gastroenteritis, infant cows' milk allergy (also see the <u>NICE guideline on</u> <u>food allergy in under 19s</u>) or an acute surgical condition	Stool microbiology investigation. Refer same day for assessment if clinically unwell, to rapid access clinic or rule out CMA first - See <u>JAPC Cow's Milk Allergy In</u> <u>Infants and Children guideline.</u>			
Abdominal distension, tenderness or palpable mass	May suggest intestinal obstruction, another acute surgical condition or be one of a multiple range of GI symptoms of cow's milk allergy	Refer for same day assessment or rule out CMA first - See <u>JAPC</u> <u>Cow's Milk Allergy In Infants and</u> <u>Children guideline</u> .			
Chronic diarrhea	onic diarrhea May suggest cows' milk allergy (also see the NICE guideline on <u>food allergy in under 19s</u>)				
Constipation/ straining and distress on passing a soft stool	ation/ straining and distress ing a soft stool May suggest cows' milk allergy (also see the NICE guideline on <u>food allergy in under 19s</u>) Severe constipation may suggest Hirschprungs				
Systemic					
Appearing unwell Fever	May suggest infection (see NICE guideline on <u>Fever in under 5s</u>)	Refer for assessment as per NICE guideline depending on features			
Dysuria	May suggest urinary tract infection (also see the NICE guideline on <u>urinary tract infection in under 16s</u>)	Clinical assessment and urine culture investigation. Specialist referral depending on NICE UTI guidelines			
Bulging fontanelle	May suggest raised intracranial pressure, for example, due to meningitis (also see the NICE guideline on <u>bacterial meningitis and</u> <u>meningococcal septicaemia in under 16s</u>	Refer for urgent assessment same day assessment. Consider calling 999 ambulance			

Rapidly increasing head circumference (more than 1 cm per week) Persistent morning headache, and vomiting worse in the morning	May suggest raised intracranial pressure, for example, due to hydrocephalus or a brain tumour	Refer for urgent same day assessment if clinically unwell, otherwise to rapid access clinic	
Altered responsiveness, for example, lethargy or irritability	May suggest an illness such as meningitis (also see the NICE guideline on <u>bacterial meningitis</u> and meningococcal septicaemia in under 16s)	Refer for urgent same day assessment. Consider calling 999 ambulance	
Infants and children with, or at high risk of atopy	May suggest cows' milk protein allergy (also see the NICE guideline <u>food allergy in under 19s</u>)	See <u>JAPC Cow's Milk Allergy In</u> <u>Infants and Children guideline</u> . Referring as per guidance	

Investigations and referrals

Arrange a specialist hospital assessment for infants, children and young people for possible upper GI endoscopy with biopsies if there is:

- haematemesis not caused by swallowed blood (assessment to take place on the same day if clinically indicated; also see table 2)
- melaena; (assessment to take place on the same day if clinically indicated; also see table 2)
- dysphagia (assessment to take place on the same day if clinically indicated)
- no improvement in regurgitation after 1 year old
- persistent, faltering growth associated with overt regurgitation despite having ruled out cow's milk allergy
- unexplained distress in children and young people with communication difficulties
- retrosternal, epigastric or upper abdominal pain that needs ongoing medical therapy or is refractory to medical therapy
- feeding aversion and a history of regurgitation despite having ruled out cow's milk allergy
- unexplained iron-deficiency anaemia
- a suspected diagnosis of Sandifer's syndrome

When deciding whether to investigate or treat, take into account that the following are associated with an increased prevalence of GORD:

- Premature birth
- Parental history of heartburn or acid regurgitation
- Obesity
- Hiatus hernia
- History of congenital diaphragmatic hernia (repaired)
- History of congenital oesophageal atresia (repaired)
- A neurodisability

Other definitions

<u>Marked distress</u> there is very limited evidence, and no objective or widely accepted clinical definition, for what constitutes 'marked distress' in infants and children who are unable to adequately communicate (expressively) their sensory emotions. In this guideline, 'marked distress' refers to an outward demonstration of pain or unhappiness that is outside what is considered to be the normal range by an appropriately trained, competent healthcare professional, based on a thorough assessment. This assessment should include a careful analysis of the description offered by the parents or carers in the clinical context of the individual child

<u>Overt regurgitation</u> refers to the voluntary or involuntary movement of part or all of the stomach contents up the oesophagus at least to the mouth, and often emerging from the mouth.

Regurgitation is in principle clinically observable, so is an overt phenomenon, although lesser degrees of regurgitation into the mouth might be overlooked.

Useful resources

Breast Feeding Network <u>http://www.breastfeedingnetwork.org.uk/</u> - resources for clinicians and mothers

Living with Reflux | Gastro-oesophageal Reflux Disease Birmingham

Reflux in babies - NHS (www.nhs.uk)

References

JAPC (Derbyshire joint area prescribing committee) Cow's milk allergy in infants and children, 2024. Guidance on the diagnosis and management of cow's milk allergy in infants and children in primary care. <u>BNF 9 Nutrition & Blood (derbyshiremedicinesmanagement.nhs.uk)</u>

Meyer et al, 2022. Diagnosis and management of food allergy-associated gastroesophageal reflux disease in young children-EAACI position paper - PubMed (nih.gov)

Mitchell et al, 2001. <u>Simultaneous monitoring of gastric and oesophageal pH reveals limitations of</u> conventional oesophageal pH monitoring in milk fed infants | Archives of Disease in Childhood (bmj.com)

NICE, 2015. Update information | Gastro-oesophageal reflux disease in children and young people: diagnosis and management | Guidance | NICE

Orenstein S, 2013. Infant GERD: Symptoms, Reflux Episodes & Reflux Disease, Acid & Non-acid Reflux— Implications for Treatment with PPIs | Current Gastroenterology Reports (springer.com)

Rosen et al, 2018. <u>Pediatric Gastroesophageal Reflux Clinical Practice Guidelines: Joint Recommendations</u> of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition - PubMed (nih.gov)

NICE (QS112) Gastro-oesophageal reflux in children and young people. <u>https://www.nice.org.uk/guidance/qs112</u> [assessed 01/03/2022]

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Appendix 1

Breast feeding mothers

First line - Instant Carobel (C&G)

This is preferred over the alginate Gaviscon Infant for breast fed babies due to increased risk of constipation and high salt content.

Brand Name	Thickening Agent	Preparations	Cost	
Instant Carobel	Carob seed flour	135g carton with 1.7g scoop	£3.98 for 135g pack	
Price as per DT March 2025				

Other thickening agents contain significant amounts of carbohydrate increasing energy density and osmolality, which may delay gastric emptying times, increase reflux and potentially reduce total volume of feed taken.

Instructions for using Carobel in breast fed babies

Make up the Carobel into a thick paste - add 3 scoops Carobel to 2floz of warm, previously boiled water. Allow 3-4 minutes for the feed to thicken, stir then give one teaspoon before feed and one teaspoon at the end of the feed if needed. Note that Carobel will continue to thicken for 10–15 minutes and may need to be loosened for subsequent feeds.

Expert discussion identified that using breast milk, whilst always the preferred option, would mean that a breastfeeding person could end up with an over abundant milk production. Please also consider that most breast-fed babies will have at least 8-10 feeds per day. If taking Carobel decreases this, it's use will need to be reviewed

Second line - Gaviscon infant

Gaviscon Infant should not be used with other feed thickening agents or infant milk preparations containing a thickening agent due to risk of intestinal obstruction. Do not use more than the stated amount. Assuming that infants are not going to be able to manage large volumes of feeds at one time due to reflux, we advise giving half a double sachet (one dose) per feed. Do not exceed the recommended dose of 6 double sachets (12 doses) over a period of 24 hours, due in part to its high salt content [each dose of Gaviscon Infant contains 21mg (0.92mmol) sodium, which can double your infants salt intake or more].

Mix each dose with a teaspoon of pre-boiled, cooled water. A smooth paste will form. Add two more teaspoons of water and mix. Partway through the feed, use a spoon to administer. Please note that giving this amount of water over 24 hours could potentially displace feed volume consumed and therefore affect growth and maternal milk supply. Expressed breast milk would be the preferable option.

If Gaviscon Infant results in constipation/ straining it should be stopped as this can exacerbate reflux. It is not appropriate to counteract side effects with laxatives.

Formula fed infants

First line - Powdered 'anti-reflux' formulas (Bought Over The Counter)

These products are available over the counter from pharmacies or supermarkets and differ in their composition. SMA anti-reflux formula contains potato starch as the thickener, and can be used to feed immediately. The other products contain carob seed gum, which thicken on mixing and are required to be left to thicken in the bottle for 7 minutes. All have to be made up with cooler water than for standard formula and require a faster flow teat. See table below:

<u>Name</u>	Tin size	Thickening agent	Unique Aspects/ Cautions
SMA Anti-reflux	800g	Potato flour	100% partially hydrolysed whey protein (supports more rapid gastric emptying) Reconstitute as per recommendations for normal formula and can feed immediately. Standard size teat may be suitable
Hipp Anti-reflux	800g	Carob bean gum	Whey: casein ratio 60:40 (standard for whey dominant infant formula) Reconstitute at cooler temperature than recommended for normal infant formula Need to leave to stand for 7 minutes and will need a faster flow teat.
C&G Anti-reflux and Aptamil Anti-reflux	800g	Carob bean gum	Whey: casein ratio 50:80 (likely to delay gastric emptying) Halal certified Reconstitute at cooler temperature than recommended for normal infant formula Need to leave to stand for 7 minutes and will need a faster flow teat.

(https://infantmilkinfo.org/type-of-infant-milk/anti-reflux-milk/anti-reflux-milk-products/)

Reviewing thickened formula use

- when starting a thickened formula or thickening agent, review efficacy after two weeks. If successful, continue until solids are introduced in sufficient quantities (around 6-7 months of age)
- do not use a thickened formula for longer than 6 months in total

Thickeners for infants prescribed hypoallergenic infant formula

First line - Instant Carobel (C&G)

This is preferred over the alginate Gaviscon Infant for formula fed infants due to increased risk of constipation and high salt content. Note a wide / variable flow (split) teat would be required for bottle fed infant.

Instructions for using Carobel in formula fed babies

- For a thinly thickened bottle feed add 1/2 scoop of Carobel to 90ml (3fl oz), providing a 1% concentration
- A standard thickened bottle feed is obtained by adding 1 scoop of Carobel to 90ml (3floz), providing a 2% concentration
- For a thick bottle feed, add 1 scoop of Carobel to 60ml (2floz), providing 3% concentration.

Shake well and leave to thicken for 3–4 minutes. Shake feed again and feed immediately. Note that Carobel will continue to thicken for 10–15 minutes.

Second line in any formula fed infant - Gaviscon infant

DO NOT GIVE GAVISCON INFANT IN COMBINATION WITH ANTI-REFLUX OR THICKENED COMFORT FORMULAS OR CAROBEL. The combination increases this risk of developing intestinal obstruction.

Assuming that infants are not going to be able to manage large volumes of feeds at one time due to reflux, we advise giving half a double sachet (one dose) per feed. Mix each sachet (one dose) into 4floz of feed into the bottle, shake well and feed as normal.

Do not exceed the recommended dose of than 6 double sachets (12 doses) over a period of 24 hours due in part to its high salt content [each dose of Gaviscon Infant contains 21mg (0.92mmol) sodium, which can double your infants salt intake or more].

If Gaviscon Infant results in constipation/ straining and bowel motions less than once daily, it should be stopped as this can exacerbate reflux. It is not appropriate to counteract side effects with laxatives.

Appendix 2

First line strategies should be offered to the family on the management of crying/ irritable and regurgitating infants and include:

- Minimise aerophagia by feeding responsively to avoid prolonged crying. Advise on looking for early signs of hunger such as moving head and mouth around, sucking on fingers and cues that the infant wants to stop e.g. spilling milk out of mouth, stop sucking, turn head away.
- Also consider assessment for restricted frenulum by specialist infant feeding team to minimise aerophagia.
- Promote smaller, more frequent feeds as more commonly seen in breast fed babies to help avoid gastric distension which triggers reflux.
- Hold infant in semi-upright position and more prone if breast feeding. Consider feeding left lateral side down (some breast-fed babies tend to prefer feeding from the right breast for this reason) as this reduces transient lower esophageal sphincter relaxations (TLESR's).
- Keep the infant upright for at least 30 minutes after a feed with a straight, extended back and avoid unnecessary jiggling/ bouncing around, travelling in a car seat or lying down.
- Carefully support winding during a feed. Try holding using the wonky winding technique, where they lie across the chest with head on the right side and legs to the left, so they are positionally more left side down but still upright.
- Consider a sling to keep the infant upright more of the time. These can hired from a sling library. Derby: https://www.dnslings.co.uk/; Cariad Babi - Cariad Babi - Specialist Baby Store Chesterfield:https://derbyshirefamilyhealthservice.nhs.uk/breastfeeding-welcome-here/chesterfieldsling-library; chesterfieldslinglibrary.com
- Encourage supervised tummy time (prone position reduces TLESR's) which also supports development of neck and core strength. Infants should be placed on their back for sleeping however due to risk of sudden infant death syndrome.
- Ensure the infant is not constipated and is passing stools without straining, as this will exacerbate reflux. Aim for a daily bowel motion in formula fed infants.

Appendix 3

Alternative H2RA for gastro-oesophageal reflux disease in children

Consider PPI (see p.6) ahead of H2RA

Acid	Formulation	Licensed	age	Dose	Comments
Suppressant		group			
H2-receptor a	ntagonists				
Cimetidine	Tablets 200mg, 400mg& 800mg	>1year		<u>>1 year</u> 25-30mg/kg per day in divided doses	No data on crushing tablets.
	Liquid 200mg/5mL			Use in age< 1 year not fully evaluated; 20mg/kg/day in divided doses has been used	Caution as CYP P450 inhibitor; care with drug interactions consult SPC
Nizatidine	Capsules 150mg	No paediatric licence		Off label use <u>6 months to 11 years</u> 5-10mg/kg/day in 2 divided Doses <u>≥12 years</u> 150mg BD	Not suitable to be used via enteral feeding tubes, as whilst drug dissolves in water, excipients do not and may coat and block tube.
Famotidine	Tablets 20mg and 40mg	No paediatric licence		Off label use: $1 \text{ to } \leq 3 \text{ months}$ 0.5mg/kg/dose OD $\geq 3 \text{ months to } < 1 \text{ year}$ 0.5mg/kg/dose BD $1 \text{ to } 16 \text{ years}$ 0.5mg/kg/dose BD (maximum 40 mg dose)	Without crushing, tablets will disperse in 2 to 5 minutes. This process can be quickened by crushing and mixing tablets with water for administration. No information available on giving resulting suspension via enteral feeding tubes.

Table taken from DHSC Supply Disruption Alert SDA/2019/005(U2) Issued 20 December 2019

References: SPCs, Handbook of Drug Administration via Enteral Feeding Tubes, The NEWT Guidelines for administration of medication to patients with enteral feeding tubes or swallowing difficulties, Evelina London Paediatric Formulary, BNFC, Paediatric & Neonatal Dosage Handbook, 23rd ed

Please note: Any decision to prescribe off-label must take into account the relevant GMC guidance and NHS Trust governance procedures for unlicensed medicines. Prescribers are advised to pay particular attention to the risks associated with using unlicensed medicines or using a licensed medicine off-label.

Document update	Date