

Chief Operating Officer's Directorate

Family Services

Obstetrics & Gynaecology

PRESCRIBING AND ADMINISTRATION OF ORAL/ENTERAL PROTON PUMP INHIBITORS (PPIS) AND H2 ANTAGONISTS

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Northern Lincolnshire and Goole NHS Foundation Trust actively seeks to promote equality of opportunity. The Trust seeks to ensure that no employee, service user, or member of the public is unlawfully discriminated against for any reason, including the "protected characteristics" as defined in the Equality Act 2010. These principles will be expected to be upheld by all who act on behalf of the Trust, with respect to all aspects of Equality.

1.0 Clinical Guideline Summary

To provide guidance on the prescribing and administration of oral/enteral proton pump inhibitors (PPIs) and H2 antagonists.

2.0 Purpose

2.1 This guideline facilitates the prescribing and administration of PPIs and H2 antagonists to patients requiring gastric acid-suppressing treatment.

3.0 Area

3.1 This guideline is for use by paediatric healthcare professionals at Northern Lincolnshire and Goole NHS Foundation Trust that may prescribe and administer PPIs and/or H2 antagonists.

4.0 Duties

4.1 Paediatric healthcare professionals at Northern Lincolnshire and Goole NHS Foundation Trust that may prescribe and administer PPIs and/or H2 antagonists.

5.0 Guideline Content

Indications for gastric acid-suppressing medicines include treatment of gastro-oesophageal reflux disease, where simple measures have failed, and gastro-protection (e.g., in patients taking long courses of high-dose oral steroids or regular NSAIDs).

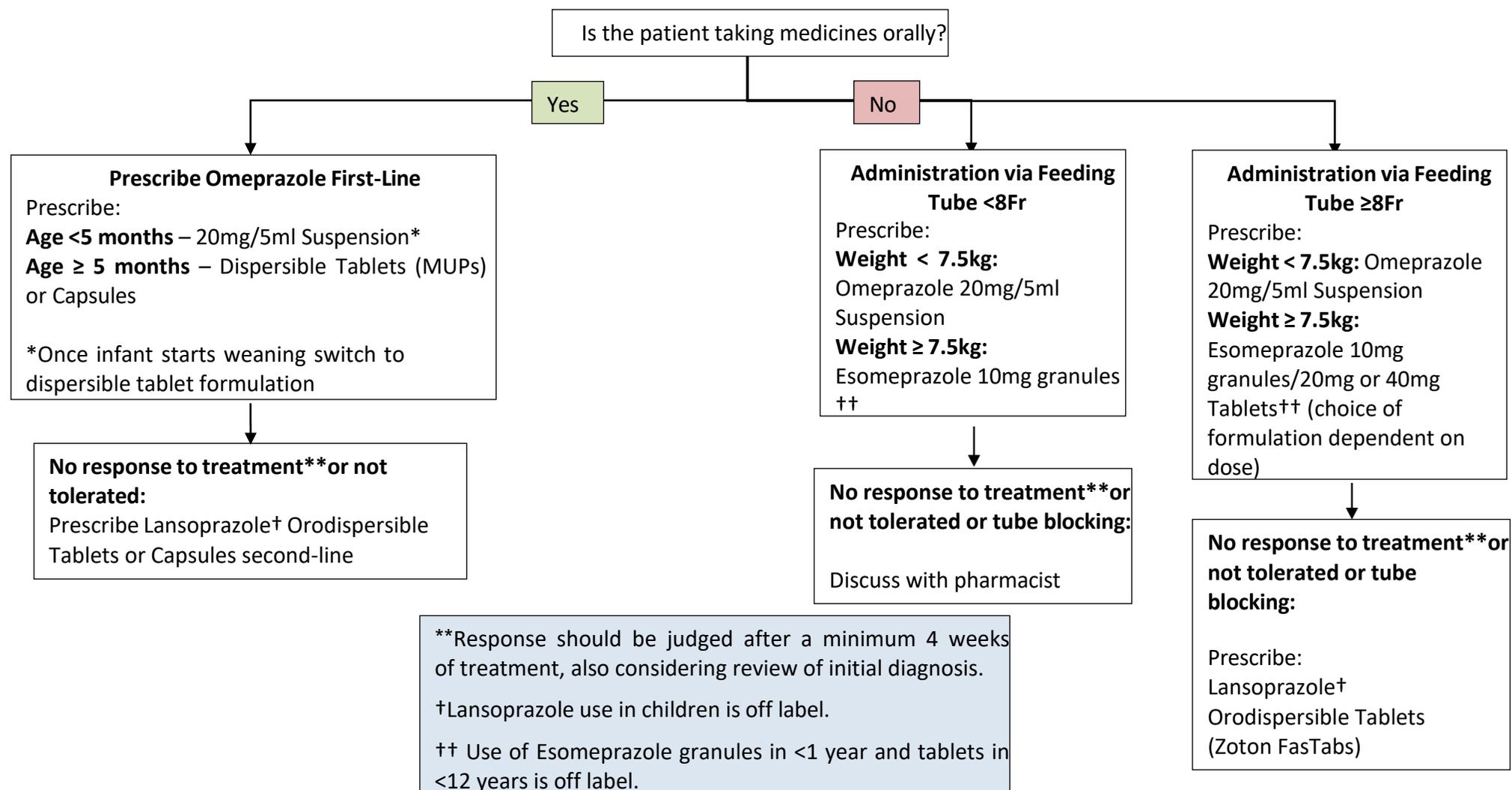
Where gastric acid-suppressing treatment is indicated, PPIs are the first-choice drugs. Three oral PPIs are available at Northern Lincolnshire and Goole NHS Foundation Trust.

Omeprazole	The choice of PPI depends on the age and weight of the child and route of administration.
Lansoprazole	
Esomeprazole	

See the algorithm below to aid selection of an appropriate PPI.

If PPIs are contraindicated, not tolerated or ineffective a H2 antagonist can be prescribed second-line. All oral ranitidine preparations are currently unavailable. If a H2-receptor antagonist needs to be added to treatment famotidine or cimetidine may be used.

Algorithm for Prescribing Proton Pump Inhibitors



Recommended Doses:**Omeprazole:**

Dispersible tablets: 10mg, 20mg

Capsules: 10mg, 20mg

Oral suspension 20mg/5ml

Age/Weight of Child	Initial Dose	Usual Maximum Dose
Neonate	700 micrograms/kg OD	2.8 mg/kg/day
≥ 1 month: < 5 kg	500 micrograms/kg BD	3.5 mg/kg/day (max 20mg/day)
≥ 1 month: 5 kg – <10 kg	5mg* OD or 2.5mg BD	
≥ 1 month: 10 kg – <20 kg	10mg OD or 5mg* BD	
≥ 1 month: weight ≥ 20 kg	20 mg OD or 10mg BD	3.5 mg/kg/day (max 40mg/day)

* Can use half a 10mg dispersible tablet for oral dose. Round doses to the nearest half a tablet.

Higher starting doses may be required for treatment of peptic ulcer disease and Zollinger- Ellison syndrome.

Infants tend to benefit from a twice daily dosing regime, due to feeding patterns affecting stimulation of gastric acid secretion.

Note: For the treatment of GORD, Omeprazole dispersible tablets and capsules are licensed for use children aged ≥1 year, weighing ≥10kg. Omeprazole suspension is licensed for use in infants and children aged ≥1 month.

Administration:

Oral dispersible tablets do not disperse evenly in water. To administer a fraction of a tablet (e.g., half) the tablet should be cut with tablet splitter to obtain the required dose. Tablets can be dispersed in water and if necessary mixed with a small amount of fruit juice, apple sauce or yoghurt immediately prior to administration. Parents should be advised that when dispersing tablets, the beads will not dissolve. The beads should not be crushed as this will render the drug inactive.

The capsules can be opened, and the contents mixed with a small amount of soft food such as yoghurt, honey or jam.

Administration via enteral feeding tubes (smaller than 8Fr / neonates & infants <7.5kg)

Use omeprazole oral suspension.

(Dispersed tablets may block fine-bore feeding tubes. They should be avoided in feeding tubes <12Fr).

Esomeprazole:

Granules for suspension: 10mg

Tablets: 20mg,40mg

Neonates & Infants weighing < 7.5kg: Use Omeprazole

Age/Weight of Child	Dose	Maximum Dose
> 1 month: \geq 7.5kg	10mg OD	3.3mg/kg/day (max 40mg)
1 – 11 years: 10-19 kg	10 mg OD	
1 – 11 years: \geq 20 kg	10 mg to 20 mg OD	
\geq 12 years	20 mg to 40 mg OD*	40mg BD

Note: Licensed for max 8 weeks treatment in children aged 1 -11 years. Prolonged use and use in infants < 1 year would be off label.

Tablets are licensed for children >12 years and can be dispersed in water for administration via a feeding tube size 8Fr and greater.

Administration via enteral feeding tubes:Granules for suspension (6Fr or larger)

1. Stop the enteral feed.
2. Flush the enteral feeding tube with water.
3. Add the contents of sachet(s) to water. Use 15ml for 10mg dose and 30ml for 20mg dose.
4. Stir.
5. Leave for a few minutes to thicken
6. Stir again.
7. Administer via the gastric tube within 30 minutes of reconstitution.
8. Refill the syringe with water, shake and flush any remaining contents down the enteral feeding tube.

Gastro-resistant tablets (8 Fr or larger):

1. Stop the enteral feed.
2. Put the tablet into an appropriate syringe and fill the syringe with approximately 25ml water and approximately 5ml air. (In some cases, dispersion in 50ml water is needed to prevent the pellets from clogging the tube).
3. Immediately shake the syringe for approximately 2 minutes to disperse the tablet.
4. Hold the syringe with the tip up and check that the tip has not clogged.
5. Attach the syringe to the tube whilst maintaining the above position.
6. Shake the syringe and position it with the tip pointing down. Immediately inject 5–10ml into the tube. Invert the syringe after injection and shake (the syringe must be held with the tip pointing up to avoid clogging of the tip).
7. Turn the syringe with the tip down and immediately inject another 5–10ml into the tube. Repeat this procedure until the syringe is empty.
8. Fill the syringe with 25ml of water and 5ml of air and repeat step 5 if necessary to wash down any sediment left in the syringe (In some cases 50ml water is needed).
9. Flush with recommended volume of water.

Non-adherence to the methods described can lead to blockage of the feeding tube

Lansoprazole:

Orodispersible tablets: 15mg,
30mg Capsules: 15mg, 30mg

Neonate: Use Omeprazole / Contact pharmacy

Infant/Child weight	Dose	Usual Maximum Dose
<3.5 kg	Use omeprazole / Contact pharmacy	N/A
3.5 kg to 5 kg	3.75 mg OD (use quarter of 15mg tablet)	< 1 year of age: 2mg/kg/day* 1-11 years of age: 3mg/kg/day* (max 30mg) ≥ 12 years: 30mg/day
5 kg to 10 kg	7.5 mg OD (use half of 15 mg tablet)	
10 kg to 30 kg	15 mg OD	
> 30 kg	15-30 mg OD	

*Round doses to nearest quarter of tablet.

Higher starting doses (e.g. double doses) may be required for treatment of peptic ulcer disease and Zollinger-Ellison syndrome.

Note: Licensed for use in adults. Use in children is off label.

Administration:

Oral dispersible tablets do not disperse evenly in water. To administer a fraction of a tablet (e.g., quarter or half) the tablet should be cut with tablet splitter to obtain the required dose, which can then be administered, either dispersed in the mouth or dispersed in water first.

Parents should be advised that when dispersing tablets, the beads will not dissolve. The beads should not be crushed as this will render the drug inactive.

Note: Dispersing whole tablets in water and giving a proportion leads to inaccurate dosing. Also, the tablets must not be crushed prior to dispersing.

Administration via enteral feeding tubes (8 Fr or larger – Zoton® brand only)

1. Stop the enteral feed.
2. Flush the enteral feeding tube with water.
3. Place an orodispersible (or proportion of) tablet in barrel of the oral syringe and add 5- 10ml water.
4. Allow the tablet to disperse, shaking if necessary.
5. Flush the medication dose down the feeding tube using a push-pull technique to keep granules suspended.
6. Flush the enteral feeding tube.

Note: Zoton® Fastabs can be administered via a feeding tube size 8Fr or greater. The minimum size of feeding tube for different generic versions varies. Therefore,

the brand should be specified for feeding tube administration to ensure continuity of supply. Pharmacy can be contacted for advice.

H2-Receptor Antagonists:

Famotidine:

Not recommended in pre-term neonates.

Age	Dose	Maximum Dose
< 3 months	0.5mg/kg OD	1mg/kg OD
> 3 months: <10kg	0.5 mg/kg BD	1mg/kg BD
> 3 months: 10 kg to < 40kg	0.5mg/kg BD	1mg/kg BD Round dose to nearest 10mg
> 3 months: ≥ 40kg	20mg BD	40mg BD

Available as 20mg and 40mg tablets and 25mg/5ml unlicensed liquid special.

Where possible, doses should be rounded to the nearest 10mg (half a 20mg tablet). For doses less than 10mg an oral suspension can be ordered.

Note: Licensed for use in adults. Use in children is off label.

Administration:

Tablets (or proportion of a tablet) can be crushed and dispersed in water for administration.

Cimetidine:

Age	Dose
< 1month	Not suitable
1 month to <5 years	20mg/kg/day in 3-4 divided doses
> 5 years	20-40mg/kg/day in 3-4 divided doses (max 400mg/dose)

Available as 200mg/5ml oral solution

Propylene Glycol Content:

Cimetidine oral solution contains 500mg/5ml propylene glycol. Propylene glycol is potentially toxic in patients who are unable to adequately metabolise and eliminate it (e.g. neonates, young children and patients with renal failure). The current daily recommended limits for propylene glycol in children are as follows:

< 1month = 1mg/kg/day

1 month to 5 years = 50mg/kg/day

> 5 years = 500mg/kg/day

Cimetidine is therefore not suitable for neonates. The dose above for infants and children aged 1 month to 5 years represents the maximum recommended daily limit of propylene glycol. Therefore, care is need if the child is on other medicines containing propylene glycol. Contact pharmacy for advice.

Interactions:

Cimetidine is a CYP450 enzyme inhibitor and therefore may interact with other medicines. See manufacturer's information, BNFC or contact pharmacy for advice.

6.0 Monitoring Compliance and Effectiveness

- 6.1** The arrangements for monitoring compliance: the patients will be reviewed initially after 1 months of initiating treatment and then every 3 months by the clinical specialist.

7.0 Associated Documents

- 7.1** N/A

8.0 References

- 8.1** NICE. Gastro-oesophageal reflux disease in children and young people: diagnosis and management. NICE Guideline [NG1]. Published 14.01.2015. Last updated 9.10.2019. <https://www.nice.org.uk/guidance/ng1>.
- 8.2** Paediatric Formulary Committee. BNF for Children (online) London: BMJ Group, Pharmaceutical Press, and RCPCH Publications <http://www.medicinescomplete.com>. Accessed 26.04.2022
- 8.3** Lexicomp Online, Pediatric and Neonatal Lexi-Drugs Online. Waltham, MA: UpToDate, Inc., 2021. <https://online.lexi.com>. Accessed 26.04.2022
- 8.4** Department of Health and Social Care. Medicines Supply Notification – Ranitidine: all formulations. Issued 30.3.2021
- 8.5** Rosen R, Vandenplas Y, Singendonk M, Cabana M, Lorenzo CD, Gottrand MD et al. Pediatric gastroesophageal reflux Clinical Practice Guidelines: Joint recommendations of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN) and the European Society for Pediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN). *J Pediatr Gastroenterol Nutr* 2018; 66: 516-554
- 8.6** Hassall E, Israel D, Shepherd R, Radke M, Dalvåg A, Sköld B et al. Omeprazole for the treatment of chronic erosive esophagitis in children: A multicenter study of efficacy, safety, tolerability and dose requirements. *J Pediatr* 2000; 137: 800-807.
- 8.7** Hassall E, Shepherd R, Koletzko S, Radke M, Henderson C, Lundborg R. Long-term maintenance treatment with omeprazole in children with healed erosive oesophagitis: a prospective study. *Aliment Pharmacol Ther* 2012; 35: 368-379
- 8.8** Ward RM, Kearns GL. Proton Pump Inhibitors in Pediatrics: Mechanism of action, pharmacokinetics, pharmacogenetics and pharmacodynamics. *Pediatr Drugs* 2013; 15: 119-131

9.0 Definitions

9.1 None.

10.0 Consultation

10.1 N/A

11.0 Dissemination

11.1 Relevant clinicians involved in paediatric healthcare professionals at Northern Lincolnshire and Goole NHS Foundation Trust that may prescribe and administer PPIs and/or H2 antagonists.

12.0 Implementation

12.1 None.

13.0 Document History

13.1 N/A

14.0 Equality Act (2010)

14.1 Northern Lincolnshire and Goole NHS Foundation Trust is committed to promoting a pro-active and inclusive approach to equality which supports and encourages an inclusive culture which values diversity.

14.2 The Trust is committed to building a workforce which is valued and whose diversity reflects the community it serves, allowing the Trust to deliver the best possible healthcare service to the community. In doing so, the Trust will enable all staff to achieve their full potential in an environment characterised by dignity and mutual respect.

14.3 The Trust aims to design and provide services, implement policies and make decisions that meet the diverse needs of our patients and their carers the general population we serve and our workforce, ensuring that none are placed at a disadvantage.

14.4 We therefore strive to ensure that in both employment and service provision no individual is discriminated against or treated less favourably by reason of age, disability, gender, pregnancy or maternity, marital status or civil partnership, race, religion or belief, sexual orientation or transgender (Equality Act 2010).

15.0 Freedom to Speak Up

Where a member of staff has a safety or other concern about any arrangements or practices undertaken in accordance with this guideline, please speak in the first instance to your line manager. Guidance on raising concerns is also available by referring to the Freedom to Speak Up Policy for the NHS (DCP126) which has been adopted by the Trust in line with national guidance. Staff can raise concerns verbally, by letter, email or by completing an incident form. Staff can also contact the Trust's Freedom to Speak Up Guardian in confidence by email to nlg-tr.ftsuguardian@nhs.net or telephone 07892764607. More details about how to raise concerns with the Trust's Freedom to Speak Up Guardian can be found on the Trust's intranet site.

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