Childhood Gastro-oesophageal Reflux

**Synonyms:** childhood GORD, GERD, reflux oesophagitis

**Definition**

Gastro-oesophageal reflux (GOR) is the non-forceful regurgitation of milk and other gastric contents into the oesophagus. Asymptomatic effortless regurgitation of a small quantity of milk after a feed (possetting) is quite normal in young infants and doesn't need any investigations or treatment.

GOR should be distinguished from vomiting which is an active process, requiring the forceful contraction of diaphragm and abdominal muscles. It occurs where there is incompetence of sphincter of the gastro-oesophageal junction or where raised intragastric or intra-abdominal pressures exist sufficient to overcome this mechanism.

Physiological, asymptomatic reflux occurs in all adults and children but is infrequent (<5% of any 24-hour period, mostly occurring postprandially). Gastro-oesophageal reflux disease (GORD) occurs when reflux is persistent, more frequent and gives rise to troublesome symptoms or complications.

**Epidemiology**

Asymptomatic effortless regurgitation of a small quantity of milk post-feed (possetting) is very common and harmless in young infants and doesn't need any investigations or treatment.

More significant GOR is also common in infancy (at least 40% of infants), usually begins before the infant is 8 weeks old, may be frequent (5% of those affected have six or more episodes each day) and usually becomes less frequent with time (resolves in 90% of affected infants before aged 1 year).[1]

GOR in otherwise healthy older children and adolescents is also common.[2] The incidence of a GOR diagnosis is age-dependent. One study found the highest prevalence among very young children and older female adolescents.[3]

**Risk factors for GOR**[1]

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

**Presentation**

Possible symptoms of GOR in children and young people include heartburn, retrosternal pain and epigastric pain.[1]

Presenting symptoms may also include:

- Recurrent regurgitation or vomiting.
- Witnessed episode of choking or apparent life-threatening event can sometimes occur.
• Respiratory problems (eg, cough, apnoea, recurrent wheeze and, less commonly, aspiration pneumonia).
• Feeding and behavioural problems.
• Failure to thrive.

Diagnosis
In the majority of cases, this is made clinically, based on the history of effortless vomiting occurring after meals. Where the history is less clear or where symptoms are more severe, investigation may be required.

Laryngopharyngeal reflux disease (LRD) in children[4]
• LRD is defined by the reflux into the larynx, oropharynx, and/or nasopharynx.
• LRD is believed to contribute to a variety of conditions, including failure to thrive, laryngomalacia, recurrent respiratory papillomatosis, chronic cough, hoarseness, oesophagitis, and aspiration.
• Diagnosis is based on a high index of suspicion if there are no symptoms specifically indicating GOR, and with confirmation by investigation, including endoscopy, pH probes, and radiographic studies.
• Management follows the same principles as outlined below.

Differential diagnosis[1]
Consider congenital hiatus hernia, gastroenteritis, pyloric stenosis, and urinary tract infection.

Symptoms of a non-IgE-mediated cow’s milk protein allergy can be similar to the symptoms of GORD, especially in infants with atopic symptoms, signs and/or a family history.

Red flag symptoms suggesting disorders other than GOR include:

• Frequent, forceful (projectile) vomiting may suggest hypertrophic pyloric stenosis in infants up to 2 months old.
• Bile-stained (green or yellow-green) vomit may suggest intestinal obstruction.
• Haematemesys (unless swallowed blood - eg, 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.
• Onset of regurgitation and/or vomiting after 6 months of age or persisting after 1 year of age. Late onset suggests a cause other than reflux - eg, urinary tract infection. Persistence suggests an alternative diagnosis.
• Blood in stool may suggest a variety of differential diagnoses, including bacterial gastroenteritis, infant cow’s milk protein allergy or an acute surgical condition.
• Abdominal distension, tenderness or palpable mass may suggest intestinal obstruction or another acute surgical condition.
• Chronic diarrhoea may suggest cow’s milk protein allergy.
• Appearing unwell and/or fever may suggest infection.
• Dysuria may suggest urinary tract infection.
• Bulging fontanelle may suggest raised intracranial pressure - eg, due to meningitis.
• Rapidly increasing head circumference (more than 1 cm per week) or persistent morning headache, and vomiting worse in the morning may suggest raised intracranial pressure - eg, due to hydrocephalus or a brain tumour.
• Altered responsiveness (eg, lethargy or irritability) may suggest an illness such as meningitis.
• Infants and children with, or at high risk of, atopy: may suggest cow’s milk protein allergy.

Investigations[1]
For infants who have GOR, there is often little correlation between reported symptoms and endoscopic and pH findings.[5]

Investigations are not usually necessary in mild cases. However, the following may be performed in more severe cases:[6]

• FBC.
- 24-hour ambulatory oesophageal pH study - usually will show frequent dips in pH <4.
- Barium meal - to exclude underlying anatomical abnormalities in the oesophagus, stomach and duodenum that may cause symptoms similar to GORD.\(^7\) This is now less commonly performed.
- Endoscopy - where oesophagitis is suspected.
- Manometry - to assess oesophageal motility and lower oesophageal sphincter function.

Do not routinely investigate or treat for GOR if an infant or child without overt regurgitation presents with only one of the following: unexplained feeding difficulties (eg, refusing to feed, gagging or choking), distressed behaviour, faltering growth, chronic cough, hoarseness, or a single episode of pneumonia.

Do not offer an upper gastrointestinal (GI) contrast study to diagnose or assess the severity of GORD in infants, children and young people. However, perform an urgent (same day) upper GI contrast study for infants with unexplained bile-stained vomiting. Explain to the parents and carers that this is needed to rule out serious disorders such as intestinal obstruction due to mid-gut volvulus.

Consider an upper GI contrast study for children and young people with a history of bile-stained vomiting, particularly if it is persistent or recurrent.

Offer an upper GI contrast study for children and young people with a history of GORD presenting with dysphagia.

Consider performing an oesophageal pH study (or combined oesophageal pH and impedance monitoring if available) in infants, children and young people with:

- Suspected recurrent aspiration pneumonia.
- Unexplained apnoeas.
- Unexplained non-epileptic seizure-like events.
- Unexplained upper airway inflammation.
- Dental erosion associated with a neurodisability
- Frequent otitis media
- A possible need for fundoplication (see below).
- A suspected diagnosis of Sandifer’s syndrome.

Consider performing an oesophageal pH study without impedance monitoring in infants, children and young people if it is thought necessary to ensure effective acid suppression.

Investigate the possibility of a urinary tract infection in infants with regurgitation if there is faltering growth, late onset (after the infant is 8 weeks old) or frequent regurgitation and marked distress.

**Management**\(^8\)

The main aims of treatment are to alleviate symptoms, promote normal growth, and prevent complications\(^9\).

**General measures**\(^1\)

Reassure parents and carers that effortless regurgitation of feeds in well infants:

- Is very common (affects at least 40% of infants).
- Usually begins before the infant is 8 weeks old.
- May be frequent (5% of those affected have six or more episodes each day).
- Usually becomes less frequent with time (it resolves in 90% of affected infants before they are 1 year old).
- Does not usually need further investigation or treatment.

Do not use positional management to treat GOR in sleeping infants. Infants must be placed on their back when sleeping.

In breast-fed infants with frequent regurgitation associated with marked distress, ensure that a person with appropriate expertise and training carries out a breast-feeding assessment.
In formula-fed infants with frequent regurgitation associated with marked distress:

- Review the feeding history.
- Reduce the feed volumes only if excessive for the infant’s weight.
- Offer a trial of smaller, more frequent feeds (while maintaining an appropriate total daily amount of milk) unless the feeds are already small and frequent.
- Offer a trial of thickened formula (eg, containing rice starch, cornstarch, locust bean gum or carob bean gum).

In formula-fed infants, if the stepped-care approach is unsuccessful, stop the thickened formula and offer alginate therapy for a trial period of 1-2 weeks. If the alginate therapy is successful continue with it, but try stopping it at intervals to see if the infant has recovered.

If cow's milk allergy is suspected then it is recommended that there should be complete elimination of cow's milk from the diet (or the mother's diet if breast-feeding) for two to three weeks and observing if symptoms resolve. This is will usually confirm suspected cases. [10]

**Review**[1]
Advise parents and carers that a review is required if:

- Regurgitation becomes persistently projectile.
- There is bile-stained vomiting or haematemesis.
- There are new concerns - eg, marked distress, feeding difficulties or faltering growth.
- There is persistent, frequent regurgitation beyond the first year of life.

**Referral**[1]
Arrange a specialist hospital assessment for infants, children and young people for a possible upper GI endoscopy with biopsies if there is:

- Haematemesis not caused by swallowed blood (assessment on the same day if clinically indicated).
- Melaena (assessment to take place on the same day if clinically indicated).
- Dysphagia (assessment to take place on the same day if clinically indicated).
- No improvement in regurgitation after the age of 1 year.
- Persistent, faltering growth associated with overt regurgitation.
- 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.
- Unexplained iron-deficiency anaemia.
- A suspected diagnosis of Sandifer's syndrome (episodic torticollis with neck extension and rotation).

**Pharmacological treatment**[1]
When simple measures fail to reduce reflux:

- Do not offer acid-suppressing drugs, such as proton pump inhibitors (PPIs) or H2-receptor antagonists (H2RAs), to treat overt regurgitation occurring as an isolated symptom in infants and children.
- Consider a four-week trial of a PPI or H2RA for those who are unable to tell you about their symptoms (eg, infants and young children, and those with a neurodisability associated with expressive communication difficulties) who have overt regurgitation with one or more of the following:
  - Unexplained feeding difficulties (eg, refusing feeds, gagging or choking).
  - Distressed behaviour.
  - Faltering growth.
- Consider a four-week trial of a PPI or H2RA for children and young people with persistent heartburn, retrosternal pain or epigastric pain.
- Assess the response to the four-week trial of the PPI or H2RA, and consider referral to a specialist for possible endoscopy if the symptoms do not resolve or they recur after stopping the treatment.
Offer PPI or H2RA treatment to infants, children and young people with endoscopy-proven reflux oesophagitis, and consider repeat endoscopic examinations as necessary to guide subsequent treatment.

Do not offer metoclopramide, domperidone or erythromycin to treat GOR or GORD without seeking specialist advice and taking into account their potential to cause adverse events.

**Enteral tube feeding for GORD**

Only consider enteral tube feeding to promote weight gain in infants and children with overt regurgitation and faltering growth if other explanations for poor weight gain have been explored and/or recommended feeding and medical management of overt regurgitation are unsuccessful.

Before starting enteral tube feeding for infants and children with faltering growth associated with overt regurgitation, agree in advance a specific, individualised nutrition plan, a strategy to reduce it as soon as possible, and an exit strategy, if appropriate, to stop it as soon as possible.

In infants and children receiving enteral tube feeding for faltering growth associated with overt regurgitation:

- Provide oral stimulation, continuing oral feeding as tolerated.
- Follow the nutrition plan, ensuring that the intended target weight is achieved and that appropriate weight gain is sustained.
- Reduce and stop enteral tube feeding as soon as possible.

Consider jejunal feeding for infants, children and young people who need enteral tube feeding but who cannot tolerate intragastric feeds because of regurgitation or if reflux-related pulmonary aspiration is a concern.

**Surgery for GORD**

Offer an upper GI endoscopy with oesophageal biopsies for infants, children and young people before deciding whether to offer fundoplication for presumed GORD.

Consider performing other investigations such as an oesophageal pH study (or combined oesophageal pH and impedance monitoring if available) and an upper GI contrast study for infants, children and young people before deciding whether to offer fundoplication.

Consider fundoplication in infants, children and young people with severe, intractable GORD if appropriate medical treatment has been unsuccessful or feeding regimens to manage GORD prove impractical - eg, for long-term, continuous, thickened enteral tube feeding.

**Complications**

Possible complications of GOR in infants, children and young people include:

- Reflux oesophagitis.
- Recurrent aspiration pneumonia.
- Frequent otitis media (for example, more than three episodes in six months).
- Dental erosion in a child or young person with a neurodisability, particularly cerebral palsy.

**Prognosis**

Most cases are benign with 55% resolved by 10 months and the vast majority resolved by 18 months. Not all infants require medications to control the symptoms. Surgery is required in a minority of patients.

- In patients whose reflux persists into later childhood, chronic cough, wheeze, clubbing, and recurrent pneumonias are a continuing theme.
- Growth and weight gain are adversely affected in two thirds of patients. Cerebral palsy, Down's syndrome, developmental delay and Sandifer's syndrome are all associated with reflux. Two thirds of patients have delayed gastric emptying, and one third aspiration pneumonia.
Further reading & references

- Gastro-oesophageal reflux disease - recognition diagnosis and management in children and young people; NICE Quality Standard (January 2016)
- Pediatric Gastroesophageal Reflux Clinical Practice Guidelines; European Society of Pediatric Gastroenterology Hepatology and Nutrition and North American Society of Pediatric Gastroenterology Hepatology and Nutrition (2009)

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