

# Heartburn, gastro-oesophageal reflux disease and non-erosive reflux disease

Haley Smith

## Abstract

Reflux is a normal process that occurs in healthy infants, children and adults. Most episodes are short-lived and do not cause bothersome symptoms or complications. Gastro-oesophageal reflux disease (GORD) develops when the reflux of stomach acid causes troublesome reflux-associated symptoms and/or complications. The most common symptom of GORD is heartburn. Depending on how severe the symptoms of GORD are, treatment may involve one or more of the following: lifestyle changes, medications, or surgery. Acid suppressive medications include, in increasing order of potency, over-the-counter antacids, alginates and H<sub>2</sub> antagonists at non-prescription strength, prescription strength H<sub>2</sub> antagonists and proton pump inhibitors. In patients with mild to moderate GORD, symptom severity and previous treatments can guide the selection of an initial acid suppressive regimen. The most common and effective treatment of oesophagitis and GORD is to reduce gastric acid secretion with a proton pump inhibitor.

**Keywords:** Non-erosive reflux disease, gastro-oesophageal reflux disease, proton pump inhibitor

## Introduction

After eating, food is carried from the mouth to the stomach through the oesophagus. The oesophagus is a tube-like structure made of tissue and muscle layers that expand and contract to propel food to the stomach through a series of wave-like movements called peristalsis. At the lower end of the oesophagus, where it joins the stomach, there is a circular ring of muscle called the lower oesophageal sphincter (LES/LOS). After swallowing the LOS relaxes to allow food to enter the stomach and then contracts again to prevent food and acid from refluxing back into the oesophagus. However, sometimes the LOS does not close properly allowing the stomach contents to leak back or 'reflux' into the oesophagus, throat and/or mouth.<sup>1-5</sup> While the lining of the stomach is resistant to the irritant effects of acid, the lining of the oesophagus is readily irritated by acid.<sup>4</sup> The dominant pathophysiologic mechanisms causing reflux are transient lower oesophageal sphincter relaxations, a weak lower oesophageal sphincter and anatomic disruption of the gastro-oesophageal junction, often associated with a hiatal hernia.<sup>2</sup>

## Gastro-oesophageal reflux disease

Some reflux is a normal process that occurs in healthy infants, children and adults. Most episodes are short-lived and do not cause bothersome symptoms or complications. Gastro-oesophageal reflux disease (GORD) develops when the reflux of stomach acid causes troublesome reflux-associated symptoms and/or complications.<sup>6,7</sup> The most common symptom of GORD

is heartburn.<sup>1</sup> Heartburn is experienced as a burning sensation in the centre of the chest, which sometimes spreads to the throat.<sup>4</sup> People who experience heartburn at least two to three times a week may have GORD.<sup>1</sup>

Other symptoms of GORD include the following:<sup>1,3,4,6</sup>

- Regurgitation
- Burning or an acid taste in the throat
- Difficulty in swallowing
- Chest pain
- Vomiting
- Persistent sore throat
- Persistent hoarseness
- Unexplained cough
- Dental disease
- Recurrent lung infection
- Chronic sinusitis
- Waking up with a choking sensation

**Heartburn and regurgitation are the cardinal and most common symptoms of GORD.**

GORD can be classified relative to the presence or absence of erosions:

### **Erosive oesophagitis**

For some patients GORD can cause erosive oesophagitis, a condition that causes inflammation, swelling, or irritation of the oesophagus. It has been found that less than half of GORD patients suffer from erosive oesophagitis. Most patients have non-erosive reflux disease, or NERD.<sup>5</sup>

### **Non-erosive reflux disease**

With NERD, patients experience typical symptoms of gastro-oesophageal reflux disease caused by reflux, but they do not have visible oesophageal mucosal injury such as erosions or ulcerations, which can be detected by conventional endoscopy.

Clinical studies have demonstrated that heartburn severity and intensity are similar in patients with erosive oesophagitis and those with NERD. A recent study found that NERD patients had a significantly higher prevalence of functional bowel disorders such as functional dyspepsia and irritable bowel syndrome, psychological disorders, and a positive acid perfusion test. Patients with erosive oesophagitis tended to experience higher prevalence of hiatal hernia, greater oesophageal acid exposure, and more oesophageal dysmotility. The absence of diaphragmatic hernia suggests that transient lower oesophageal sphincter relaxation is likely to be the predominant mechanism for gastro-oesophageal reflux in most NERD patients. In contrast to GORD, women predominate in NERD, and as a group they are younger by a decade. Only 10% of those with NERD are discovered to have erosive oesophagitis over time and it is unlikely that NERD is a precursor or an early development to erosive reflux disease.<sup>7</sup> The two conditions appear to be distinct. Patients with NERD are thought to comprise a heterogeneous group in which the two most important mechanisms are considered to be the reflux of acid and non-acid contents and oesophageal mucosal hypersensitivity.<sup>7,8</sup>

## **Management of GORD**

Depending on how severe the symptoms of GORD are, treatment may involve one or more of the following: lifestyle changes, medications, or surgery.<sup>5</sup> Initial treatments for mild acid reflux include lifestyle changes, dietary modification and using non-prescription medications, including antacids, alginates, histamine-2 (H<sub>2</sub>) receptor antagonists and proton pump inhibitors.<sup>1</sup>

### **Lifestyle changes and dietary modifications**

Lifestyle modifications are aimed at enhancing oesophageal acid clearance, minimising the incidence of reflux events, or both.<sup>8</sup> Lifestyle changes and dietary modifications include the following:<sup>1,3-5,8</sup>

#### *Eat smaller meals*

Eating large meals may cause the stomach to become over-distended. This increases upward pressure against the oesophageal sphincter causing acid reflux.

#### *Avoid acid reflux-inducing foods*

Some foods may cause relaxation of the LOS, promoting acid reflux. Excessive caffeine, chocolate, peppermint and fatty foods may cause bothersome acid reflux in some people.

#### *Avoid lying down for three hours after a meal*

Eating three or more hours before bedtime will help to minimise reflux. Gravity helps to keep the stomach contents from backing up into the oesophagus. Lying down with a full stomach makes reflux more likely.

#### *Avoid smoking*

Saliva helps to neutralise refluxed acid and is one of the body's defenses against damage to the oesophagus. Smoking inhibits the production of saliva and reduces the amount of saliva in the mouth and throat. Smoking also stimulates the production of stomach acid, and can weaken and relax the LOS. It can also provoke coughing, causing frequent episodes of acid reflux in the oesophagus. Quitting smoking can reduce or eliminate symptoms of mild reflux.

#### *Avoid alcohol*

Alcohol increases the production of stomach acid, relaxes the lower oesophageal sphincter, allowing stomach contents to reflux back up into the oesophagus, and can make the oesophagus more sensitive to stomach acid.

#### *Avoid tight-fitting clothing*

Clothing that fits tightly around the abdomen increases pressure on the stomach, forcing food up against the LOS, and causing food to reflux into the oesophagus. Tight-fitting belts and slenderising undergarments are best avoided.

#### *Maintain a healthy weight*

Obesity is a risk factor for developing GORD. Obesity increases abdominal pressure, which can then push stomach contents up into the oesophagus. Losing weight may help people who are overweight to reduce symptoms of acid reflux. An increase in GORD symptoms occurs in individuals who gain weight.

#### *Raise the head of the bed*

By elevating the head of the bed, the head and shoulders are raised higher than the stomach, allowing gravity to prevent acid from refluxing. The head of the bed can be elevated by placing bricks, blocks or anything that's sturdy securely under the legs at the head of the bed to raise it. A foam wedge under the mattress or a wedge pillow to elevate the shoulders and head may also be used. Bed elevation is important for individuals with nocturnal or laryngeal symptoms of reflux.

## **Medication**

Acid suppressive medications include, in increasing order of potency, over-the-counter antacids, alginates and H<sub>2</sub> antagonists at non-prescription strength, prescription strength H<sub>2</sub> antagonists and proton pump inhibitors. In patients with mild to moderate GORD, symptom severity and previous treatments

can guide the selection of an initial acid suppressive regimen. The most common and effective treatment of oesophagitis and GORD is to reduce gastric acid secretion with either an H<sub>2</sub> antagonist or a proton pump inhibitor.<sup>8</sup>

#### *Antacids*

Antacids are usually the first agents recommended to relieve heartburn and other mild GORD symptoms. Antacids are typically used for short-term relief of acid reflux. However, the stomach acid is only neutralised briefly after each dose, so antacids only offer short-term symptom relief.<sup>4,5</sup> Antacids alone do not heal an inflamed oesophagus damaged by stomach acid.<sup>9</sup> Many brands on the market use different combinations of three basic salts, magnesium, calcium, and aluminium, with hydroxide or bicarbonate ions to neutralise the acid in the stomach. Magnesium salts, however, can lead to diarrhoea, and aluminium salts can cause constipation. Aluminium and magnesium salts are therefore often combined in a single product to balance these effects.<sup>4,5</sup>

#### *Alginates*

Alginates are often used in combination with antacids to prevent acid reflux. These medicines work by forming a raft that floats on top of the stomach contents, thereby preventing reflux. Alginates are effective in mild to moderate GORD.<sup>10,11</sup>

#### *H<sub>2</sub>-receptor antagonists*

The H<sub>2</sub>-antagonists reduce the amount of acid that the stomach produces by blocking the action of histamine, which usually signals the stomach to make acid after eating. H<sub>2</sub>-antagonists have a slower onset of action when compared to antacids, but they provide longer relief.<sup>4,12</sup> Over-the-counter medications include cimetidine 200 mg and ranitidine 75mg. Stronger versions of these medications are available with a prescription.<sup>9,13</sup>

#### *Proton pump inhibitors (PPIs)*

Proton pump inhibitors are the most effective treatment option for GORD. In clinical trials, these agents have consistently been demonstrated to be more effective than any other acid-suppressant agent in healing erosive oesophagitis and in relieving GORD-related symptoms.

PPIs block acid by reducing the body's production of gastric acid, allowing time for damaged oesophageal tissue to heal.<sup>9</sup> PPIs have a slower onset of action than H<sub>2</sub>-receptor antagonists, but they relieve symptoms for longer periods.<sup>12</sup> Although some proton pump inhibitors are available over-the-counter, their use in this setting is restricted to 14 days for mild acid reflux symptoms. Over-the-counter proton pump inhibitors include lansoprazole 15 mg and pantoprazole 20 mg.<sup>13</sup> Higher dosage PPIs and other PPIs are available on prescription e.g. omeprazole, esomeprazole and rabeprazole.

Note: Patients with moderate to severe symptoms of acid reflux, complications of GORD, or mild acid reflux symptoms that have not responded to the lifestyle modifications and the medications described above usually require treatment with prescription

medications. Most patients with persistent symptoms are treated with a proton pump inhibitor.<sup>1</sup> These medicines are most helpful for people who have moderate to severe symptoms of heartburn on more than two days of the week.<sup>1</sup> These patients are usually treated with a prescription dose PPI for 8 weeks. Patients suffering persistent or recurring symptoms, however, are best referred to the doctor for comprehensive symptom assessment.<sup>10</sup>

The superior efficacy of PPIs is also observed in NERD patients.<sup>7</sup> NERD patients, however, demonstrate a highly variable and unpredictable symptomatic response to antireflux treatment. This is likely to explain the high percentage of NERD patients who fail PPI treatment.<sup>7</sup>

Novel therapeutic modalities are currently under evaluation for GORD patients and specifically those with NERD. The main areas of interest include improving acid suppression, reducing the transient lower oesophageal sphincter relaxation rate, decreasing oesophageal sensitivity, and enhancing oesophageal motility.<sup>7</sup>

#### **Surgical treatment**

Because of the effectiveness of medical therapy, the role of surgery has become more complex. Antireflux surgery may be considered in patients who require high doses of proton pump inhibitors to control symptoms, particularly in young patients who may require lifelong therapy. However, whether surgery is beneficial in patients who have failed therapy with a proton pump inhibitor remains controversial. In general, antireflux surgery involves repairing the hiatus hernia and strengthening the lower oesophageal sphincter. The most common surgical treatment is the laparoscopic Nissen fundoplication. This procedure involves wrapping the upper part of the stomach around the lower end of the oesophagus.<sup>1,14</sup> Patients who have undergone fundoplication may continue to use antisecretory medications.<sup>14</sup>

Response to antireflux surgery has been shown to be different between patients with NERD versus those with erosive oesophagitis. Clinical studies comparing the outcome of antireflux surgery in patients with erosive oesophagitis versus those with NERD, demonstrated that 91% versus 56% reported heartburn resolution and 94% versus 79% were satisfied with surgery, respectively.<sup>7</sup>

#### **Conclusion**

Some patients with mild or intermittent symptoms of GORD may be able to manage their acid reflux by dietary modifications, lifestyle changes and/or by taking non-prescription medication. The healthcare professionals can play an important role in helping the patient to select an appropriate medication that will help relieve and treat the symptoms of heartburn or GORD. The healthcare professionals can also offer practical advice on measures to prevent recurrence of the condition.

## References

1. Kahrilas PJ, MD. Author. Patient information: Acid reflux (gastroesophageal reflux disease) in adults (Beyond the Basics). Last updated: September 01, 2011. [homepage on internet]. c2012. Available from: [http://www.uptodate.com/contents/patient-information:acid-reflux-\(gastroesophageal-reflux-disease\)-in-adults-\(beyond-the-basics\)](http://www.uptodate.com/contents/patient-information:acid-reflux-(gastroesophageal-reflux-disease)-in-adults-(beyond-the-basics))
2. Kahrilas PJ, MD. Author. Pathophysiology of reflux esophagitis. Last updated: December 8, 2011. [homepage on internet]. c2012. Available from: <http://www.uptodate.com/contents/pathophysiology-of-reflux-esophagitis>
3. Written by doctors and editors at UpToDate. Patient information: Acid reflux (gastroesophageal reflux disease) in adults (The Basics). [homepage on internet]. c2012. Available from: [http://www.uptodate.com/contents/patient-information:Acid-reflux-\(gastroesophageal-reflux-disease\)-in-adults-\(The-Basics\)](http://www.uptodate.com/contents/patient-information:Acid-reflux-(gastroesophageal-reflux-disease)-in-adults-(The-Basics))
4. Blenkinsopp A, Paxton P, Blenkinsopp J. Authors. Heartburn. Symptoms in the pharmacy. A guide to the management of common illness. Sixth edition. c2009. ISBN: 978-1-405-18079-5.
5. Gillson S. Author. Nonerosive reflux disease – NERD. Updated July 02, 2008. [homepage on internet]. Available from: [http://www.heartburn.about.com/od/gerdacidrefluxdisease/a/nerd\\_reflux.htm](http://www.heartburn.about.com/od/gerdacidrefluxdisease/a/nerd_reflux.htm)
6. Kahrilas PJ, MD. Author. Clinical manifestations and diagnosis of gastroesophageal reflux in adults. Last updated: March 07, 2012. [homepage on internet]. c2012. Available from: <http://www.uptodate.com/contents/clinical-manifestations-and-diagnosis-of-gastroesophageal-reflux-in-adults>
7. Hershovici T, MD, Fass R, MD. Author. Nonerosive reflux disease – an update. *Journal of neurogastroenterology and motility (JNM)*. Published 31 January 2010. c2012. [homepage on internet]. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2879816/>
8. Kahrilas PJ, MD. Author. Medical management of gastroesophageal reflux disease in adults. Last updated: November 05, 2012. [homepage on internet]. c2012. Available from: <http://www.uptodate.com/contents/medical-management-of-gastroesophageal-reflux-disease-in-adults>
9. By Mayo clinic staff. Heartburn. May 21, 2012. c2012. [homepage on internet]. Available from: <http://www.mayoclinic.com/health/heartburn-gerd/DS00095>
10. South African medicines fromulary (SAMF). Antacid therapy. Tenth edition. c2012. The division of clinical pharmacology, faculty of health sciences. University of Cape Town.
11. Gillson S. Author. Gastroesophageal reflux disease (GERD). Updated April 28, 2012. [homepage on internet]. Available from: [http://heartburn.about.com/od/gerdacidrefluxdisease/a/gerd\\_acidreflux.htm](http://heartburn.about.com/od/gerdacidrefluxdisease/a/gerd_acidreflux.htm)
12. Gillson S. Author. H2 Blockers. Updated June 27, 2011. [homepage on internet]. Available from: <http://heartburn.about.com/od/medsremedies/a/h2blockers.htm>
13. Monthly index of medical specialities (MIMS). Acid reducers. Volume 53. Number 7. July 2012.
14. Fass R, MD. Author. Approach to refractory gastroesophageal reflux disease in adults. Last updated: April 23, 2012. [homepage on internet]. c2012. Available from: <http://www.uptodate.com/contents/approach-to-refractory-gastroesophageal-reflux-disease-in-adults>