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Definition

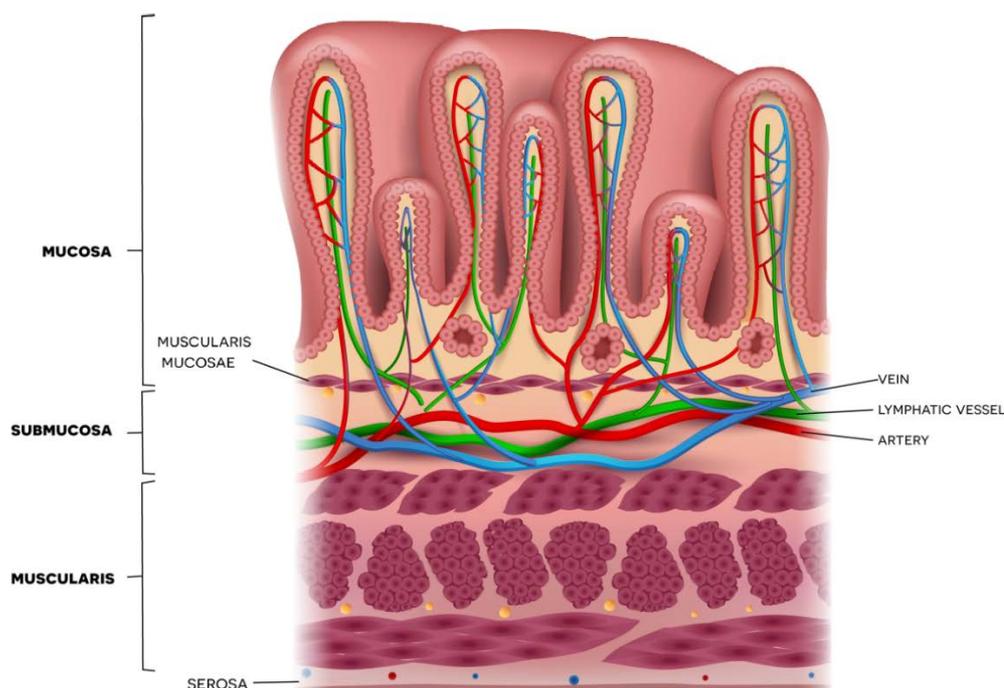
Dyspepsia is a complex of upper gastrointestinal tract symptoms, typically present for four or more weeks. The symptoms include upper abdominal **pain** or discomfort, heartburn, acid reflux, nausea or vomiting.¹

Below are the most common causes of dyspepsia.¹

Gastro-oesophageal reflux disease (GORD): this is a usually chronic condition, where reflux of gastric contents (particularly acid, bile, and pepsin) back in to the oesophagus causes predominant symptoms of heartburn and acid regurgitation.²

Peptic ulcer disease (gastric or duodenal ulcers): a breach in the epithelium of the gastric or duodenal mucosa, which penetrates the *muscularis mucosae*. Endoscopy confirms peptic ulcer disease.³ The diagram below shows the mucosa and *muscularis mucosae*.

Stomach / duodenal wall

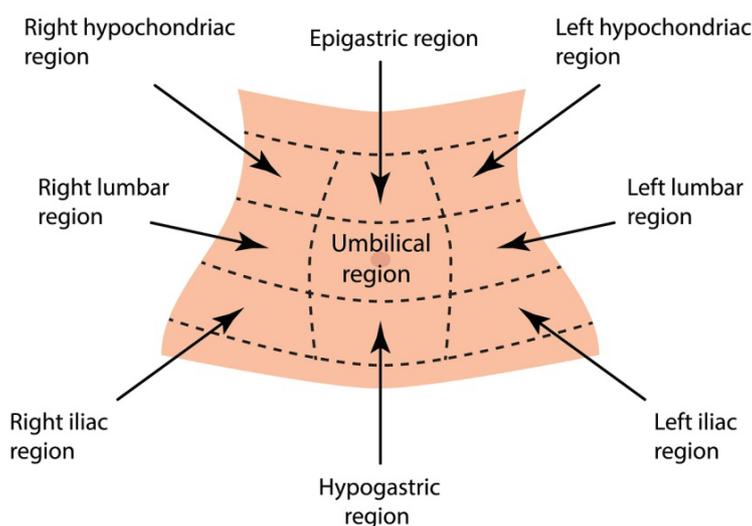


Functional dyspepsia (non-ulcer dyspepsia): people who have dyspepsia symptoms and normal findings on endoscopy have functional dyspepsia (gastric or duodenal ulcer, gastric **malignancy** or oesophagitis are excluded).⁴

There are two sub-types of functional dyspepsia, which may overlap:

- epigastric pain syndrome, where intermittent or burning pain is localised to the epigastric region (as shown in the image below)
- post-prandial distress syndrome, where there is post-prandial (during or after a meal) fullness or early satiety (feeling full after a small amount of food).⁴

REGIONS OF THE ABDOMEN



Two other potential causes of dyspepsia are Barrett's oesophagus (a premalignant condition) and upper gastrointestinal **malignancy**.¹ To find out more about these conditions, visit Cancer Research UK's page **Barrett's oesophagus** and the NICE clinical knowledge summaries page **Gastrointestinal tract (upper) cancers – recognition and referral**.

The Northern Ireland Centre for Pharmacy Learning and Development (NICPLD) **Dyspepsia: evidence-based management of** e-learning programme examines the symptoms and causes presenting as dyspepsia and is available to support your learning on this topic via CPPE's website.

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Prevalence and incidence

Dyspepsia symptoms are estimated to occur in about 40 percent of the population each year. Of this 40 percent, five percent consult their GP about their symptoms and one percent go on to have an endoscopy. Out of those who have an endoscopy, 40 percent have functional dyspepsia, 40 percent have GORD and 13 percent have some form of ulcer.⁵

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Signs and symptoms

The severity of symptoms of dyspepsia can be very variable and personal. For most people, symptoms are mild or intermittent. Symptoms of dyspepsia are defined as:

- upper abdominal pain or discomfort
- heartburn
- gastric reflux
- nausea and/or vomiting.⁵

In GORD, heartburn and acid regurgitation are the main symptoms, but hoarseness, coughing, asthma, and dental erosions may be present in some people.²

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Causes/risk factors

There are many potential causes of dyspepsia and the symptoms may be triggered by:

- smoking
- alcohol
- coffee
- chocolate
- fatty foods
- being overweight
- stress
- medicines such as calcium channel blockers, nitrates, theophylline, bisphosphonates, corticosteroids and non-steroidal anti-inflammatory drugs (NSAIDs)
- tight clothing
- pregnancy.⁵

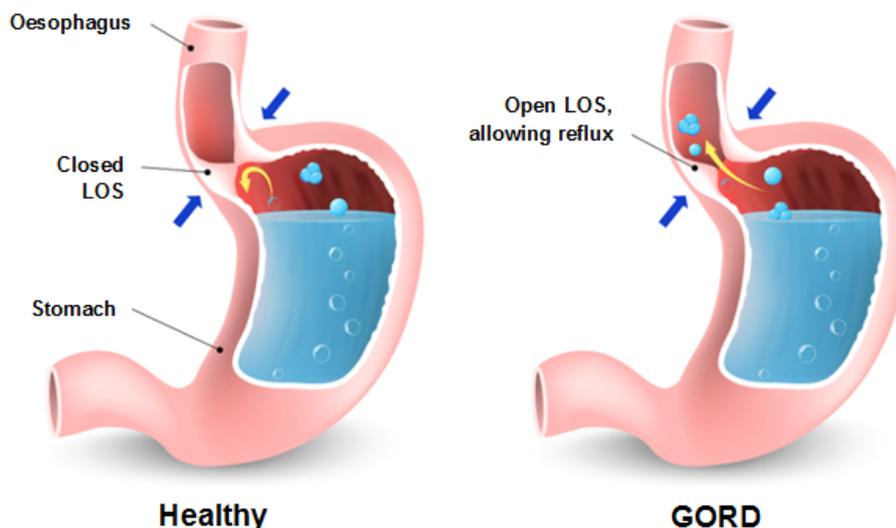
The causes and risk factors of the underlying conditions may vary.

GORD

A combination of mechanisms is thought to cause GORD:

- transient relaxation (reduced tone) of the lower oesophageal sphincter (LOS), as shown in the diagram below
- increased intra-gastric pressure (for example, straining and coughing)
- delayed gastric emptying
- impaired oesophageal clearance of acid.²

Reduced lower oesophageal sphincter (LOS) tone



To find out more about medicines that can lower LOS tone, visit the Open Anaesthesia page **Esoph sphincter tone: Anes drugs**.

In addition to the listed causes, GORD may be a result of a hiatus hernia, which lowers the LOS tone, or due to genetic factors.⁶

Peptic ulcer disease

Helicobacter pylori (*H. pylori*) and the use of NSAIDs or aspirin are the main risk factors of both gastric and duodenal ulcers.⁷

Around 95 percent of duodenal ulcers and 70-80 percent of gastric ulcers are associated with *H. pylori* infection. *H. pylori* infection can cause either:

- increased gastric acid secretion, increasing the risk of mucosal ulceration
- decreased gastric acid secretion, which causes chronic atrophic gastritis, increasing the risk of gastric ulceration and possible gastric malignancy.

NSAID and aspirin use increase the risk of complications of peptic ulcer disease; in NSAID users this risk is quadrupled and in aspirin users the risk is doubled when compared to those who do not use either medicine.⁷

Bisphosphonates, corticosteroids, potassium supplements, selective serotonin reuptake inhibitors (SSRIs), and recreational drugs such as crack cocaine have also been linked to increased risk of peptic ulcers.

A rare condition called Zollinger-Ellison syndrome is associated with high acid secretion and may lead to multiple peptic ulcers, diarrhoea, weight loss, and hypercalcaemia.^{7, 8}

Watch the TedEd video to find out how *H. pylori* was discovered as a cause of stomach ulcers:

The surprising cause of stomach ulcers – Rusha Modi



Functional dyspepsia

The cause of functional dyspepsia remains uncertain, but is likely related to multiple factors. Factors that may contribute include:

- gastroduodenal dysmotility – impaired muscle functioning in the stomach and duodenum⁴
- hypersensitivity to gastric distention, which is associated with postprandial epigastric pain, belching, and weight loss⁹
- abnormalities in gastric acid secretion⁴
- psychosocial factors⁴
- infectious gastroenteritis may increase the risk of developing subsequent functional dyspepsia.⁴

H. pylori is linked to chronic superficial gastritis. Although the link between chronic gastritis and dyspepsia symptoms is controversial, it is believed that *H. pylori* infection may play a role in functional dyspepsia, but this role is still unclear.¹⁰

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Pathophysiology (mechanism of disease)

For more information on the physiology, pathology and pathophysiology associated with dyspepsia, visit the NICPLD e-learning programme ***Dyspepsia: evidence-based management of***. This programme contains learning on the way that NSAIDs can lead to dyspepsia, how the parietal cell produces gastric acid, the pathophysiology of GORD, the pathogenesis of peptic ulcer disease and the theories surrounding pathophysiology of functional dyspepsia.

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Prognosis and complications

Prognosis varies with the causes of dyspepsia: from persistent symptoms in functional dyspepsia, to severe oesophagitis and oesophageal cancer in GORD, to a mortality rate of ten percent in those with a bleeding peptic ulcer and 25 percent in those with a perforated peptic ulcer.¹¹⁻¹³

GORD is associated with oesophageal haemorrhage, ulcers, strictures (abnormal narrowing), anaemia due to blood loss, aspiration pneumonia, Barrett's oesophagus and oral problems, eg, dental erosion, gingivitis (gum disease) and halitosis (bad breath).¹⁴

Peptic ulcer disease is associated with increased risk of complications in older people, those with co-morbidities and those taking NSAIDs or anticoagulants. Complications include acute massive haemorrhage, which may be life threatening in those who are frail; chronic bleeding, which causes iron deficiency anaemia; perforation and life threatening peritonitis; gastric outlet obstruction due to strictures; and stenosis and stomach cancer.¹⁵

Complications associated with functional dyspepsia include reduced quality of life due to persistent symptoms and increased risk of peptic ulcer disease.¹³

For more information on the prognosis and complications of dyspepsia, visit the following NICE clinical knowledge summaries pages:

*Dyspepsia – proven GORD **Prognosis** and **Complications***

*Dyspepsia – proven peptic ulcer **Prognosis** and **Complications***

*Dyspepsia – proven functional **Prognosis** and **Complications***

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Diagnosis and management

For most people, symptoms are mild or intermittent⁵ and may be managed through self-care and over-the-counter treatments, eg, antacids and/or alginates, low-dose histamine (H₂)-receptor antagonist (H₂RA) and some low-dose proton pump inhibitors (PPIs). The NHS recommends that people cut down on tea, coffee, cola or alcohol, prop their head and shoulders up in bed, lose weight and avoid eating three to four hours before bed, eating rich, spicy or fatty foods, smoking, and taking ibuprofen or aspirin.¹⁶

If symptoms are not controlled with over-the-counter medicines, a routine referral to the GP should be made. In the presence of alarm signals, people should have an urgent GP referral, as outlined in NICE guidance ***Suspected cancer: recognition and referral [NG12]*** section 1.2 *Upper gastrointestinal tract cancers*.

On presentation to a GP, a full history should be taken, lifestyle advice should be reinforced and, based on clinical judgement, the GP may prescribe a proton pump inhibitor or offer an *H. pylori* test. If the symptoms are recurrent, or if there is acute gastrointestinal bleeding, this may lead to referral for endoscopy.⁵

Proton pump inhibitor

At least one month of PPI treatment should be offered to those with symptoms of dyspepsia before the cause is identified, to those with GORD and functional dyspepsia, and as part of a *H. pylori* eradication regime as discussed below.

The choice of PPI, dosing information, contraindications and cautions, adverse effects and drug interactions are summarised on the NICE CKS page ***Dyspepsia – unidentified cause Proton pump inhibitors (PPIs)***.

Information on when to offer PPIs and the duration of therapy can be found in the following summaries:

Dyspepsia – unidentified cause: Initial management

Dyspepsia – proven GORD: Initial management

Dyspepsia – proven peptic ulcer: Initial management

Dyspepsia – proven functional: Initial management

***H. pylori* testing**

H. pylori testing involves a breath test, stool antigen test or blood serum test. More information about this testing can be found on Lab Tests Online under ***Helicobacter pylori Testing***. It should be noted that a two-week washout period after PPI use is needed before a *H. pylori* test.¹⁷

If tests for *H. pylori* are positive, a one-week triple-therapy *H. pylori* eradication regimen can be offered. A PPI, amoxicillin, and *either* clarithromycin or metronidazole is the first line option.¹⁸ Recommended regimes are listed in the *British National Formulary (BNF)* under ***Helicobacter pylori infection***. Local guidance may vary and should be consulted. Also, the person's allergy status should be taken into account when selecting an antibiotic regime.

Endoscopy

The NHS website offers information about what happens during an ***Endoscopy***.

Acid suppression therapy should be stopped for at least two weeks before the procedure date. Self-treatment with antacid and/or alginate therapy can be suggested, if needed.¹⁹ The results of an endoscopy can aid diagnosis of the cause of dyspepsia and guide treatment options.

Other considerations

Those who present with dyspepsia symptoms significant enough to lead to GP referral should be assessed for stress, anxiety and depression which may worsen symptoms. Support should be offered to manage this if needed.²⁰⁻²³

Management changes with refractory or recurrent symptoms and alternative treatment such as H₂RA may be considered, depending on the circumstances. Long-term management also involves a step down of treatment, and potentially self-treatment, with antacid and/or alginate therapy (although this is not recommended for long-term or continuous use).²⁴

More information can be found here:

Dyspepsia – unidentified cause: Refractory or recurrent symptoms

Dyspepsia – proven GORD: Refractory or recurrent symptoms

Dyspepsia – proven peptic ulcer: Follow-up in primary care

Dyspepsia – proven functional: Refractory or recurrent symptoms

Full NICE clinical guidance ***Gastro-oesophageal reflux disease and dyspepsia in adults: investigation and management [CG184]*** can also be accessed, along with the NICE pathway ***Dyspepsia and gastro-oesophageal reflux disease overview***.

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Patient support

The NHS offers several pages which relate to dyspepsia:

Stomach ulcer

Indigestion

Heartburn and acid reflux

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Further resources

The Public Health England page ***Helicobacter pylori in dyspepsia: test and treat*** is a quick reference guide for primary care, describing how to test for and treat *H. pylori* in dyspepsia.

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External websites

CPPE is not responsible for the content of any non-CPPE websites mentioned on this page or for the accuracy of any information to be found there.

All web links were accessed on 25 April 2022.

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