ANTI-ULCER DRUGS

Normally, the linings of the oesophagus, stomach, and duodenum are protected from the irritant action of stomach acids or bile by a thin covering layer of mucus. If this is damaged, or if large amounts of stomach acid are formed, the underlying tissue may become eroded, causing a peptic ulcer. An ulcer often leads to abdominal pain, vomiting, and changes in appetite. The most common type of ulcer occurs just beyond the stomach, in the duodenum. The exact cause of peptic ulcers is not understood, but a number of risk factors have been identified, including heavy smoking, the regular use of aspirin or similar drugs, and family history. An organism found in almost all patients who have peptic ulcers, *Helicobacter pylori*, is believed to be the main causative agent.

The symptoms caused by ulcers may be relieved by an antacid (see facing page), but healing is slow. The usual treatment is with an anti-ulcer drug, such as a proton pump inhibitor, bismuth, or sucralfate, although an H_2 blocker may be used. The anti-ulcer drug is usually combined with antibiotics to eradicate *Helicobacter pylori* infection.

Why they are used

Anti-ulcer drugs are used to relieve symptoms and heal the ulcer. Untreated ulcers may erode blood vessel walls or perforate the stomach or duodenum.

Eradication of *Helicobacter pylori* by an antisecretory drug (such as a proton pump inhibitor) combined with two antibiotics (triple therapy), may provide a cure in one to two weeks. Surgery is reserved for complications such as obstruction, perforation, haemorrhage, and when there is a possibility of cancer.

How they work

Drugs protect ulcers from the action of stomach acid, allowing the tissue to heal. H_2 blockers, misoprostol, and proton pump inhibitors reduce the amount of acid released; bismuth and sucralfate form a protective coating over the ulcer. Bismuth also has an antibacterial effect.

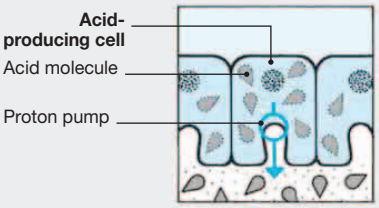
How they affect you

These drugs begin to reduce pain in a few hours and usually allow the ulcer to heal in four to eight weeks. They produce few side effects, although H_2 blockers such as cimetidine can cause confusion in the elderly. Bismuth may blacken the faeces and sucralfate may cause constipation; misoprostol, diarrhoea; and proton pump inhibitors, either constipation or diarrhoea. Triple therapy is given for one or two weeks. If *Helicobacter pylori* is eradicated, maintenance therapy should not be necessary. Sucralfate is usually prescribed for up to 12 weeks, and bismuth and misoprostol for four to eight weeks. Because they may mask symptoms of stomach cancer, H_2 blockers and proton pump inhibitors are normally prescribed only when tests have ruled out this disorder.

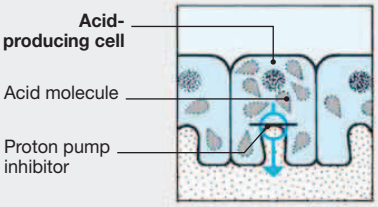
ACTION OF ANTI-ULCER DRUGS

Proton pump inhibitors

Acid secretion by the cells lining the stomach depends on an enzyme system (also known as the proton pump) that transports hydrogen ions across the cell walls. Omeprazole, lansoprazole, and similar drugs work by blocking the proton pump. They can stop stomach acid production until a new supply of the enzyme can be made by the body and, therefore, have a long duration of action.



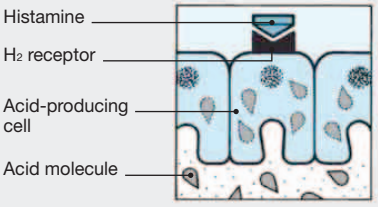
The proton pump
This enzyme system transports hydrogen ions across the cell wall into the stomach, thereby stimulating acid secretion.



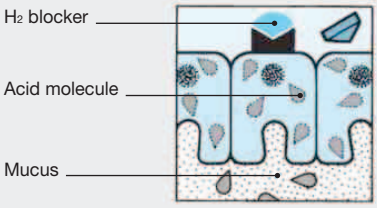
The action of proton pump inhibitors
Proton pump inhibitors block the enzyme system, stopping the transport of hydrogen ions and, thus, the secretion of acid.

H_2 blockers

Histamine is a chemical released by mast cells (see Allergies, p.81) that can produce a number of effects in different parts of the body. In the stomach, histamine stimulates H_2 receptors, causing acid production. To control stomach acid production, a class of antihistamine drugs was developed that acts by blocking the H_2 receptors. These drugs are known as H_2 blockers to distinguish them from antihistamines used for allergic disorders (see p.82), which are sometimes called H_1 blockers because they block H_1 receptors.



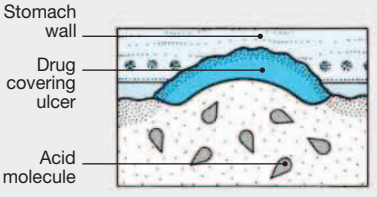
The action of histamine on the stomach
Histamine binds to specialized H_2 receptors and stimulates acid-producing cells in the stomach wall to release acid.



The action of H_2 blockers
H_2 blockers occupy H_2 receptors, preventing histamine from triggering the production of acid. This allows the mucous lining to heal.

Sucralfate and bismuth

Sucralfate forms a coating over the ulcer, protecting it from the action of stomach acid and allowing it to heal. Bismuth may stimulate production of prostaglandins or bicarbonate, and also kills the bacteria that are thought to cause most peptic ulcers.



COMMON DRUGS

Proton pump inhibitors
Esomeprazole
Lansoprazole ✻
Omeprazole ✻
Pantoprazole
Rabeprazole ✻

H_2 blockers
Cimetidine ✻
Famotidine
Nizatidine
Ranitidine ✻

Other drugs
Antacids (see p.66)
Antibiotics (see p.86)
Carbenoxolone
Misoprostol ✻
Sucralfate ✻
Tripotassium dicitrato-bismuthate (bismuth chelate)

✻ See Part 3