to the acidity of the stomach, and milk is alkaline. Now it is known that *H. pylori* grows very well in milk, and milk was perhaps one of the worst treatments to recommend. This is why it is important for health-care professionals to keep current on treatments supported by research. Some medications used to treat peptic ulcers include antibiotics, mucosal protectants, prostaglandins, antispasmodics, H_2-receptor antagonists, and proton pump inhibitors. Each is described in more detail here.

- **Antibiotics.** Antibiotics fight *H. pylori*. When the *H. pylori* is killed, the ulcer has a chance to heal. Antibiotics used to treat *H. pylori* include amoxicillin (Amoxil, Trimox), clarithromycin (Biaxin), metronidazole (Flagyl), and tetracycline. These agents are never used alone but in a combination of two antibiotics. This approach helps to avoid failure of treatment as well as antibiotic resistance. It is important that patients complete the entire 7- to 14-day regimen, even if they feel better, to remove the bacterium completely. Bismuth compounds can also be prescribed because they are bacteriostatic and stop *H. pylori* from sticking to the mucosa.
- **Mucosal protectants.** Mucosal protectants work to cover and protect the ulcer to promote healing. These oral medications must be taken on an empty stomach. Mucosal protectants such as sucralfate (Carafate), which is aluminum hydroxide and sulfated sucrose, are like a bandage protecting a wound from dirt and injury and allowing it to heal. Side effects include constipation and vitamin deficiency.
- **Prostaglandins.** Prostaglandins are hormone-like substances with a wide range of effects on the body, such as contraction and relaxation of smooth muscle, moderation of inflammation, and control of blood pressure. In the case of peptic ulcers, misoprostol (Cytotec) is a prostaglandin that inhibits gastric acid secretion and thus decreases the amount of acid in the stomach and protects the lining of the stomach. It is used to reduce the risk for NSAID-induced ulcers. This medication is taken orally, and side effects may include diarrhea, stomach cramps, and nausea during the first weeks of treatment; these side effects can be reduced by taking the medication with food. This drug must not be used during pregnancy because of the risk for miscarriage, premature labor, or possible birth defects.
- **Antispasmodics.** Antispasmodics (anticholinergics) decrease secretions and gastric mobility, reduce gastric spasm, and slow gastric motility. These effects decrease the exposure of the fragile gastric mucosa to HCl by keeping food in the stomach and reducing the amount of stomach acids produced. These medications are also used to treat GERD, ulcerative colitis, diverticulitis, biliary spasm, and irritable bowel syndrome. Examples include dicyclomine (Bentyl) and glycopyrrolate (Robinul). These are both available by prescription only. They may be administered orally but if needed can be given as an IM injection and, in the case of glycopyrrolate, as an IV dose.
- **H_2-receptor antagonists.** H_2-receptor antagonists are a group of drugs that block histamine from binding to parietal cells and prevent the parietal cells from secreting the gastric acid HCl. H_2-receptor antagonists include the drugs cimetidine (Tagamet), famotidine (Pepcid), nizatidine (Axid), and ranitidine (Taladine, Zantac). All of these medications are available both by prescription and in other forms OTC. Initial treatment of ulcers with cimetidine, famotidine, and ranitidine may be accomplished via IV therapy. Then, once the acute phase is treated, oral forms of the medications are begun. Nizatidine is only administered orally. In addition, ranitidine may be given as an IM injection. H_2-receptor antagonists can be taken with or without meals, but they are most effective if taken approximately 30 minutes before meals so that medications levels are optimal when acid is actively being produced. In addition, they should not be given within 1 hour of an antacid because the antacid may inhibit the absorption of the H_2-receptor antagonist. Side effects may include nausea, vomiting, diarrhea, dry mouth, dizziness, weakness, headache, and muscle cramps.
- **Proton pump inhibitors.** As discussed earlier in relation to GERD, these drugs reduce the acidity of the stomach and thus decrease exposure of the ulceration to acid. They are frequently combined with antibiotics to act against *H. pylori*.

Antacids and GI stimulants are also often used in the treatment of ulcers.