

# Antacids

Antacids are medicaments that **neutralize hydrochloric acid in the stomach**. Acidic stomach pH is required to activate pepsinogen to pepsin. Neutralization of HCl and subsequent increase in pH thus secondarily reduces pepsin activity. Some antacids also form a **protective layer** on the gastric mucosa or **stimulate the secretion** of endogenous prostaglandins. They are mainly used for pyrosis, dyspepsia or gastric and duodenal ulcers.

## Effects

The main effect of the antacid is to **neutralize HCl** and **thus increase the pH**. The resulting pH depends on the substance administered and the food content of the stomach. The substance disappears from the empty stomach in about 30 minutes, if food is present, the effect lasts for about 2 hours. In addition to inhibiting pepsin, increasing pH also leads to increased gastrin secretion. Depending on the type of antacid, either **laxative** or **constipation effects** predominate. Some types form a **protective layer** in the stomach, thus protecting the gastric mucosa from HCl and pepsin.

## Side effects

The side effects of antacids are related to the increase in pH, which can change the absorption of some substances. For example, premature dissolution of enteric coatings may occur, thereby altering the bioavailability of the drug. Specific adverse reactions are listed for each antacid type.

## Indication

Antacids are mainly used for dyspepsia associated with **gastric hyperacidity** - such as heartburn (pyrosis), peptic ulcer disease or gastroesophageal reflux disease, mostly as part of combination therapy. They are taken between meals.

## Formulations

### Generally acting

- **Sodium bicarbonate** (*natrium hydrogencarbonicum*) also known as baking soda – is the simplest antacid, has a strong and short-term effect, but a rapid rise in pH can cause secretion of gastrin and this will increase the secretion of HCl, thus eliminating the neutralizing effect. Sodium bicarbonate is one of the antacids that act in general (they also increase blood pH).
- **Calcium carbonate** (*calcium carbonicum*) – has a strong and fast effect, disadvantage is the possibility of calcium absorption into the blood and the consequent increase in calcium, thus it should not be administered long-term.

### Locally acting

- **Magnesium oxide** (*magnesium oxydatum*) – in an aqueous medium it changes to magnesium hydroxide and further to  $MgCl_2$ .
- **Magnesium hydroxyluminate** (*magnesium aluminicum*) – in the stomach it decomposes into MgO and  $Al_2O_3$ , the most used antacid in Czech Republic.
- **Aluminum hydroxide** (*aluminium hydroxydatum*) – creates a protective gel on the mucosa, the onset of action is slow, the effect is long-lasting.
- **Magnesium trisilicate** (*magnesium trisilicum*) – releases  $SiO_2$ , that binds HCl and pepsin, forms a protective layer on the mucosa, the effect is weak.
- **Aluminum phosphate** (*aluminium phosphoricum*) and alkaline bismuth nitrate (*bismuthi subnitrates*) – antacid and protective effects.

Magnesium-containing antacids have a laxative effect, aluminum compounds are rather constipating, so they are often combined.

## Links

### Related articles

- Proton pump inhibitors

- H<sub>2</sub>-antagonists

## Literature

- LINCOVÁ, Dagmar, et al. *Základní a aplikovaná farmakologie*. 1. edition. GALÉN, 2002. 601 pp. ISBN 80-7262-168-8.
- HYNIE, Sixtus. *Farmakologie v kostce*. 2. edition. Triton, 2001. 520 pp. ISBN 80-7254-181-1.