Antacids structure and uses

Antacids are medications that increase the pH balance in your stomach. A number of symptoms, including heartburn, gastritis, and gastro -esophageal reflux disease (GERD), can be treated with them. In most cases, antacids start working within a few minutes. It is important to note that they may not always be necessary, and they can have serious consequences if used improperly.

The most common of these bases are hydroxides, carbonates, or bicarbonates. The following table contains a list of the active ingredients found in several common commercial antacids, and the reactions by which these antacids neutralize the HCl in stomach acid.

- Compound
- Chemical Formula
- Chemical Reaction
- Aluminum hydroxide

Al(OH)3

Al(OH)3(s) + 3 HCl(aq) —–> AlCl3(aq) + 3 H2O(l)

Calcium carbonate

CaCO3

CaCO3(s) + 2 HCl(aq) —–> CaCl2(aq) + H2O(l) + CO2(g)

Magnesium carbonate

MgCO3

MgCO3(s) + 2 HCl(aq) —–> MgCl2(aq) + H2O(l) + CO2(g)

Magnesium hydroxide

Mg(OH)2

Mg(OH)2(s) + 2 HCl(aq) —–> MgCl2(aq) + 2 H2O(l)

Sodium bicarbonate

NaHCO3

NaHCO3(aq) + HCl(aq) —–> NaCl(aq) + H2O(l) + CO2(g)

- What Are Antacids?
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- What Are Antacids Used For?
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Working of antacids

The opposite of an acid is a base, and that’s exactly what an antacid is. Antacids make you feel better by increasing the pH balance in your stomach. The pH system is a scale for measuring the acidity or alkalinity of a given environment (in this case, your stomach). The scale goes from 0 to 14. A pH of 7 is neutral. Below 7 is acid. Above 7 is alkaline

Normally, the acid level in your stomach is about 2 or 3. Trouble may start when your pH drops below those numbers. To make you feel better, an

antacid need not bring the pH level all the way up to 7 (neutral), which would be a highly unnatural state for your stomach. In order to work, all the antacid has to do is get you to 3 or 4. It does this by neutralizing some of the excess acid.

Due to several complex factors, a base can’t neutralize your acid all by itself. A base needs some chemical “ helpers,” or ingredients, to accompany it as it neutralizes the acid in your stomach.

All antacids contain at least one of these four primary ingredients:

- Sodium
- Calcium
- Magnesium
- Aluminum.

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What Are Antacids?

Antacids are medicines that work by increasing the pH balance in your stomach. Americans currently spend close to $1 billion per year on antacids. This is because antacids can quickly relieve the symptoms associated with occasional heartburn and indigestion. Though they cause problems for some, antacids can be taken safely by most people. Consumers who use antacids

only once in a while, and as directed, are unlikely to experience significant side effects.

But antacids may not always be necessary, and they can have serious consequences if used improperly. Frequent and prolonged use can cause irreparable harm to your heart, kidneys, or bones. Even if used occasionally and in moderation, antacids can cause problems for people with special medical conditions.

How Do They Work?

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Types of Antacids

As mentioned above, antacids have four types of ingredients. Within these four types, there are many different brands. Below we discuss each type, name several brands, and discuss their possible side effects.

Sodium Antacids (Alka-Seltzer, Bromo-Seltzer, and Others)

Sodium bicarbonate (commonly known as baking soda) is perhaps the best-known of the sodium-containing antacids. It is potent and fast-acting. As its name suggests, it is high in sodium. If you’re on a salt-restricted diet, and especially if the diet is intended to treat high blood pressure (hypertension), take a sodium-containing antacid only under a doctor’s orders.

Calcium Antacids (Tums, Alka-2, Titralac„¢, and Others)

Antacids in the form of calcium carbonate or calcium phosphate are also potent and fast-acting. Regular or heavy doses of calcium (more than five or six times per week) can cause constipation. Heavy and extended use of this product may clog your kidneys and cut down the amount of blood they can process. Extended use of calcium antacids can also cause kidney stones.

Magnesium Antacids (Maalox, Mylanta, Riopan, Gelusil, and Others)

Magnesium salts come in many forms — carbonate, glycinate, hydroxide, oxide, trisilicate, and aluminosilicate. it has a mild laxative effect; it can cause diarrhea. For this reason, magnesium salts are rarely used as the only

active ingredients in an antacid, but are combined with aluminum, which counteracts the laxative effect. (The brand names listed above all contain magnesium-aluminum combinations.)Like calcium, magnesium may cause kidney stones if taken for a prolonged period, especially if the kidneys are functioning improperly to begin with. A serious magnesium overload in the bloodstream (hypermagnesemia) can also cause blood pressure to drop, leading to respiratory or cardiac depression – a potentially dangerous decrease in lung or heart function.

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Aluminum Antacids (Rolaids, Alternagel , Amphojel, and Others)

Salts of aluminum (hydroxide, carbonate gel, or phosphate gel) can also cause constipation. For these reasons, aluminum is usually used in combination with the other three primary ingredients.

Used heavily over an extended period, antacids containing aluminum can weaken bones, especially in people who have kidney problems. Aluminum can cause dietary phosphates, calcium, and fluoride to leave the body, eventually causing bone problems such as osteomalacia or osteoporosis.

It should be emphasized that aluminum-containing antacids present virtually no danger to people who have normal kidney function and who use these products only occasionally and as directed.

Uses of Antacids

Antacids can be used to treat a number of common symptoms in the esophagus, stomach, and intestines. Some of these antacid uses include:

- Indigestion
- Gastritis
- Heartburn
- Gastro-esophageal reflux disease (GERD)
- Peptic ulcer.

Indigestion

Indigestion is a fuzzy word that is often used to refer to vague abdominal discomfort. It is also referred to as:

- Sour stomach
- Acid indigestion
- Upset stomach
- Acid stomach.

Gastritis

Gastritis is a condition that occurs when your stomach lining becomes inflamed by too much acid secretion.

Heartburn

Heartburn occurs when the stomach’s contents, including its corrosive juices, go into reverse and come back up the esophagus (known as acid reflux or gastro- esophageal reflux).

Gastro-esophageal Reflux Disease

If you experience gastro esophageal reflux frequently, then you may have something called gastro esophageal reflux disease, or GERD for short.

Peptic Ulcer

If the location of the burning sensation is a little lower, and if it stays around formore than a few days, you could have a peptic ulcer. An ulcer is simply a sore in your stomach that keeps getting irritated by stomach acid.

Side effects

Excess calcium from supplements, fortified food and high-calcium diets, can cause the milk-alkali syndrome, which has serious toxicity and can be fatal. In 1915, Bertram Sippy introduced the “ Sippy regimen” of hourly ingestion of milk and cream, the gradual addition of eggs and cooked cereal, for 10 days, combined with alkaline powders, which provided symptomatic relief for peptic ulcer disease. Over the next several decades, the Sippy regimen resulted in renal failure, alkalosis, and hypercalemia, mostly in men with peptic ulcer disease. These adverse effects were reversed when the regimen stopped, but it was fatal in some patients with protracted vomiting. Milk alkali syndrome declined in men after effective treatments were developed for peptic ulcer disease. But during the past 15 years, it has been reported in women taking calcium supplements above the recommended range of 1200

to 1500 mg daily, for prevention and treatment of osteoporosis, and is exacerbated by dehydration. Calcium has been added to over-the-counter products, which contributes to inadvertent excessive intake.

The New England Journal of Medicine reported a typical case of a woman who arrived in the emergency department vomiting and altered mental status, writhing in pain. She had consumed large quantities of chewable antacid tablets containing calcium carbonate. She gradually recovered.

Compounds containing calcium may also increase calcium output in the urine, which might be associated with kidney stones. Calcium salts may cause constipation.

Other adverse effects from antacids include

Carbonate: regular high doses may cause alkalosis, which in turn may result in altered excretion of other drugs, and kidney stones. A chemical reaction between the carbonate and hydrochloric acid may produce carbon dioxide gas. This causes gastric distension which may not be well tolerated. Carbon dioxide formation can also lead to headaches and decreased muscle flexibility.

Aluminum hydroxide: may lead to the formation of insoluble aluminium-phosphate-complexes, with a risk for hypophosphatemia and osteomalacia. Although aluminium has a low gastrointestinal absorption, accumulation may occur in the presence of renal insufficiency. Aluminium-containing drugs may cause constipation.

Magnesium hydroxide: It has laxative properties. Magnesium may accumulate in patients with renal failure leading to hypermagnesemia, with cardiovascular and neurological complications. See Milk of magnesia.

Sodium: increased intake of sodium may be deleterious for arterial hypertension, heart failure and many renal diseases.

Side effects from antacids vary depending on individual and other medications they may be taking at the time. Those who experience side effects most commonly suffer from changes in bowel functions, such as diarrhea, constipation, or flatulence.

Although reactions to any drug may vary from person to person, generally those medications that contain aluminum or calcium are the likeliest to cause constipation, those that contain magnesium are the likeliest to cause diarrhea. Some products combine these ingredients, which essentially cancels them out, to forestall unpleasant side effects.

In general, people with kidney problems should probably not take antacids as this can sometimes cause a condition known as alkalosis. In other people, side effects may occur if substances such as salt, sugar, or aspirin, are added to a particular medication. As with all medications, always carefully read the product label on the package and check with your doctor or pharmacist if you have any question about potential drug interactions or side effects.

Some side effects, such as constipation and diarrhea, are fairly obvious. Other more serious side effects, such as stomach or intestinal; bleeding, can be more difficult to recognize. In general, any sign of blood in the stool or the

presence of vomiting is a danger sign and should be brought to the immediate attention of a physician.

If your symptoms persist for more than 10 days to two weeks while you are using the medication, you should stop taking it and consult your doctor. Persistent symptoms may indicate that you have more a serious problem than occasional acid reflux. Pregnant or nursing baby should always consult your doctor before taking this medication. Generally, you should not give these medications to children under the age of 12 unless under the advice and supervision of your doctor or the package label has indicated that the product is safe for young children

Antacids (The Truth About Antacid)

I’m sure you know of someone who suffers from heartburn on a regular basis and takes antacids like they’re candy. It might even be you. Most people think the answers to all their stomach problems can be resolved by taking over-the-counter antacids. In reality, their digestive problems typically stem from low stomach acid, very few digestive enzymes, and huge meals that were not chewed well enough. These meals cause food to sit in the digestive tract longer than they should.

As a result, food ferments, causing gas and bloating when it is not properly digested. As gases rise and reach the esophagus, they cause pain in the chest that some say feels like a heart attack. Too much gas causes the valve that keeps the stomach contents out of the esophagus to stretch. This spills acid into the esophagus, causing the stinging sensation other wise known as heartburn.

Taking an antacid medication may temporarily ease the burning sensation since it reduces stomach acid. When this is done, improper food digestion occurs, and then ferments. Then the whole problem starts all over again. By using antacids to control stomach acid, the stomach compensates by providing more acid.

Below I have outlined common ingredients in antacids and their effects on our body. Please read carefully through them. It is amazing that, especially if taken in large doses, antacids can be harmful to your health!

Aluminum salts: These salts interfere with the absorption of phosphates. This can lead to constipation, loss of appetite, weakness, and bone damage. Aluminum salts can aggravate patients with Alzheimer’s disease, kidney disease, those who are dehydrated, and those with certain bone disorders.

Calcium salts: In excess, calcium sales can cause constipation, urinary tract disorders, headaches, mood changes, muscles weakness, and nausea.

Sodium bicarbonate: This has a laxative effect. Sodium bicarbonate can also affect blood pressure and cause swollen feet and legs.

In addition, antacids can interfere with the absorption of vitamins and medication, especially antibiotics. Antacids that contain magnesium can be dangerous when given to people who have a kidney disease. It can also be dangerous for those who suffer from dehydration. I have read that antacids block the vitamin B12€¦the most vital vitamin for the human brain. Researchers believe that the lack of vitamin B12 in the brain may be one cause of Alzheimer’s disease.

If indeed you have osteoporosis or are at risk, or if you are a child, you should never take antacids. I am in the process of putting out 10 proven tips that will reduce your heartburn within a very short period of time. I too have suffered from years and years of agonizing heartburn and it is my pleasure to share these secrets to you. Until recently, I learned the truth about antacids and some proven methods of curing heartburn.

Let face it, if you are going to settle for treating heartburn instead of curing it, you'll be wasting your money! This method of treatment will bring absolutely no long term effects and a possibility of esophagus cancer could occur. In our next newsletter, I will discuss 10 techniques to conquering heartburn.

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Is Simethicone an Antacid?

Some antacids contain an ingredient called simethicone, a gastric defoaming agent that breaks up gas bubbles, making them easier to eliminate from your body.

The Food and Drug Administration (FDA) says simethicone is safe and effective in combination with antacids for relief of intestinal gas associated with heartburn. Not all antacids contain simethicone.

If you are looking for relief of symptoms associated with gas, read the antacid’s label carefully to make sure it contains simethicone.

What Are Antacids Used For?

Antacids can be used to treat a number of common symptoms in the esophagus, stomach, and intestines. Some of these antacid uses include:

- Indigestion
- Gastritis
- Heartburn
- Gastroesophageal reflux disease (GERD for short)
- Peptic ulcer.

If antacids fail to relieve symptoms of any of these conditions within 10 to 15 minutes, or if symptoms are severe, you should visit your doctor.