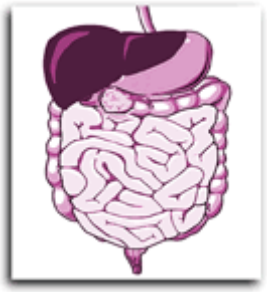

Harmful Effects of Medicines on the Adult Digestive System

NIDDK National Digestive Diseases Information Clearinghouse

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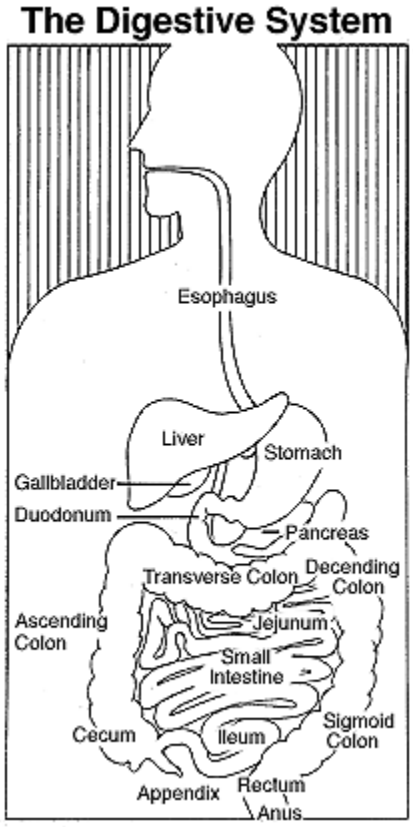
Many medicines taken by mouth may affect the digestive system. These medicines include prescription (those ordered by a doctor and dispensed by a pharmacist) and nonprescription or over-the-counter (OTC) products. A glossary at the end of this fact sheet describes some common prescription and nonprescription medicines discussed below that may affect the digestive system.

Although these medicines usually are safe and effective, harmful effects may occur in some people. OTC's typically do not cause serious side effects when taken as directed on the product's label. It is important to read the label to find out the ingredients, side effects, warnings, and when to consult a doctor.

Always talk with your doctor before taking a medicine for the first time and before adding any new medicines to those you already are taking. Tell the doctor about all other medicines (prescription and OTC's) you are taking. Certain medicines taken together may interact and cause harmful side effects. In addition, tell the doctor about any allergies or sensitivities to foods and medicines and about any medical conditions you may have such as diabetes, kidney disease, or liver disease.



Be sure that you understand all directions for taking the medicine, including dose and schedule, possible interactions with food, alcohol, and other medicines, side effects, and warnings. If you are an older adult read all directions carefully and ask your doctor questions about the medicine. As you get older, you may be more susceptible to drug interactions that cause side effects.

People with a food intolerance such as gluten intolerance should make sure their medicines do not contain fillers or additives with gluten. Check with your doctor if you have any questions or concerns about your medicines. Follow the doctor's orders carefully, and immediately report any unusual symptoms or the warning signs described below.

The Esophagus Irritation

Some people have difficulty swallowing medicines in tablet or capsule form. Tablets or capsules that stay in the esophagus may release chemicals that irritate the lining of the esophagus. The irritation may cause ulcers, bleeding, perforation (a hole or tear), and strictures (narrowing) of the esophagus. The risk of pill-induced injuries to the esophagus increases in persons with conditions involving the esophagus, such as strictures, scleroderma (hardening of the skin), achalasia (irregular muscle activity of the esophagus, which delays the passage of food), and stroke.

Some medicines can cause ulcers when they become lodged in the esophagus. These medicines include aspirin, several antibiotics such as tetracycline, quinidine, potassium chloride, vitamin C, and iron.

Warning signs

- Pain when swallowing food or liquid.
- Feeling of a tablet or capsule "stuck" in the throat.
- Dull, aching pain in the chest or shoulder after taking medicines.

Precautions

- Swallow tablets or capsules while you are in an upright or sitting position.
- Before taking a tablet or capsule, swallow several sips of liquid to lubricate the throat, then swallow the tablet or capsule with at least a full glass (8 ounces) of liquid.
- Do not lie down immediately after taking medicines to ensure that the pills pass through the esophagus into the stomach.
- Tell your doctor if painful swallowing continues or if pills continue to stick in the throat.

Esophageal Reflux

The lower esophageal sphincter (LES) muscle is between the esophagus and the stomach. The muscle allows the passage of food into the stomach after swallowing. Certain medicines interfere with the action of the sphincter muscle, which increases the likelihood of backup or reflux of the highly acidic contents of the stomach into the esophagus.

Medicines that can cause esophageal reflux include nitrates, theophylline, calcium channel blockers, anticholinergics, and birth control pills.

Warning signs

- Heartburn or indigestion.
- Sensation of food coming back up into the throat.

Precautions

- Avoid foods and beverages that may worsen reflux, including coffee, alcohol, chocolate, and fried or fatty foods.
- Cut down on, or preferably quit, smoking.
- Do not lie down immediately after eating.

The Stomach

Irritation

One of the most common drug-induced injuries is irritation of the lining of the stomach caused by nonsteroidal anti-inflammatory drugs (NSAIDs).

NSAIDs can irritate the stomach by weakening the ability of the lining to resist acid made in the stomach. Sometimes this irritation may lead to inflammation of the stomach lining (gastritis), ulcers, bleeding, or perforation of the lining.

In addition, you should be aware that stomach irritation may occur without having any of the symptoms below.

Older people are especially at risk for irritation from NSAIDs because they are more likely to regularly take pain medicines for arthritis and other chronic conditions. Also at risk are individuals with a history of peptic ulcers and related complications or gastritis. These individuals should tell their doctor about any of these previous conditions. Special medicines may be needed to protect the stomach lining.

Warning signs

- Severe stomach cramps or pain or burning in the stomach or back.
- Black, tarry, or bloody stools.
- Bloody vomit.
- Severe heartburn or indigestion.
- Diarrhea.

Precautions

- Use coated tablets, which may lessen stomach irritation.
- Avoid drinking alcoholic beverages while taking medicines.
- Take medicines with a full glass of water or milk or with food, which may reduce irritation.

Delayed Emptying of the Stomach

Some medicines cause nerve and muscle activity to slow down in the stomach. This slowing down causes the contents of the stomach to empty at a slower rate than normal.

Drugs that may cause this delay include anticholinergics and drugs used to treat Parkinson's disease and depression.

Warning signs

- Nausea.
- Bloating.
- Feeling of fullness.
- Vomiting of food eaten many hours earlier.
- Pain in midabdomen.
- Heartburn or indigestion.
- Sensation of food coming back up into the throat.

Precautions

- Eat frequent, small meals.
- Do not lie down for about 30 minutes after eating.
- Tell your doctor if symptoms continue. Your doctor may consider changing your dosage of the medicine or trying a new medicine.

The Intestine

Constipation

Constipation can be caused by a variety of medicines. These medicines affect the nerve and muscle activity in the large intestine (colon). This results in the slow and difficult passage of stool. Medicines also may bind intestinal liquid and make the stool hard.

Medicines that commonly cause constipation include antihypertensives, anticholinergics, cholestyramine, iron, and antacids that contain mostly aluminium.

Warning sign

- Constipation that is severe or disabling or that lasts several weeks.

Precautions

- Drink plenty of fluids.
- Eat a well-balanced diet that includes whole grains, fruits, and vegetables.
- Exercise regularly.
- Take laxatives only under a doctor's supervision.

Diarrhea

Diarrhea is a common side effect of many medicines. Diarrhea is often caused by antibiotics, which affect the bacteria that live normally in the large intestine.

Antibiotic-induced changes in intestinal bacteria allow overgrowth of another bacteria, *Clostridium difficile* (*C. difficile*), which is the cause of a more serious antibiotic-induced diarrhea.

The presence of *C. difficile* can cause colitis, an inflammation of the intestine in which the bowel "weeps" excess water and mucus, resulting in loose, watery stools. Almost any antibiotic may cause *C. difficile*-induced diarrhea, but the most common are ampicillin, clindamycin, and the cephalosporins. Antibiotic-induced colitis is treated with another antibiotic that acts on *C. difficile.*

Diarrhea also can be a side effect of drugs that do not cause colitis but that alter the movements or fluid content of the colon. Colchicine is a common cause of drug-induced diarrhea.

Magnesium-containing antacids can have the effect of laxatives and cause diarrhea if overused. In addition, the abuse of laxatives may result in damage to the nerves and muscles of the colon and cause diarrhea.

Warning signs

- Blood, mucus, or pus in the stool.
- Pain in the lower abdomen.
- Fever.

Precautions

- If diarrhea lasts for several days, consult your doctor.

The Liver

The liver processes most medicines that enter the bloodstream and governs drug activity throughout the body. Once a drug enters the bloodstream, the liver converts the drug into chemicals the body can use and removes toxic chemicals that other organs cannot tolerate. During this process, these chemicals can attack and injure the liver.

Drug-induced liver injury can resemble the symptoms of any acute or chronic liver disease. The only way a doctor can diagnose drug-induced liver injury is by stopping use of the suspected drug and excluding other liver diseases through diagnostic tests. Rarely, long-term use of a medicine can cause chronic liver damage and scarring (cirrhosis).

Medicines that can cause severe liver injury include large doses of acetaminophen (and even in small doses when taken with alcohol), anticonvulsants such as phenytoin and valproic acid, the antihypertensive methyldopa, the tranquilizer chlorpromazine, antituberculins used to treat tuberculosis such as isoniazid and rifampin, and vitamins such as vitamin A and niacin.

Warning signs (for liver injury)

- Severe fatigue.
- Abdominal pain and swelling.
- Jaundice (yellow eyes and skin, dark urine).
- Fever.
- Nausea or vomiting.

Precautions

- If you have ever had a liver disease or gallstones, you should discuss this with your doctor before taking any medicines that may affect the liver or the gallbladder.
- Take these medicines **only** in the prescribed or recommended doses.

Glossary of Medicines

The following glossary is a guide to medicines used to treat many medical conditions. The glossary does not include all medicines that may affect the digestive system. If a medicine you are taking is not listed here, check with your doctor.

Acetaminophen

Acetaminophen relieves fever and pain by blocking pain centers in the central nervous system.

Examples of brand names include Tylenol, Panadol, and Datril.

Antacids

Antacids relieve heartburn, acid indigestion, sour stomach, and symptoms of peptic ulcer. They work by neutralizing stomach acid.

Aluminum hydroxide antacids include Alu-Tab and Amphojel; calcium carbonate antacids include Tums, Alka Mints, and Rolaids Calcium Rich; magnesium antacids include Mylanta and Maalox.

Antibiotics

Antibiotics destroy or block the growth of bacteria that cause infection.

Hundreds of antibiotics are available, including penicillins (Amoxil, Amcil, and Augmentin), clindamycin, cephalosporins (Keflex and Ceclor), tetracyclines (Minocin, Sumycin, and Vibramycin), quinolones (Cipro), and sulfa drugs (Bactrim).

Anticholinergics

This class of medicines affects the nerve cells or nerve fibers and includes drugs for depression, anxiety, and nervousness.

Examples of anticholinergics include propantheline (Pro-banthine) and dicyclomine (Bentyl). Examples of antidepressants include amitriptyline (Elavil and Endep), and nortriptyline (Aventyl and Pamelor).

Medicines for relieving the symptoms of Parkinson's disease also are in this category. Examples include levodopa (Dopar) and carbidopa and levodopa combination (Sinemet).

Anticonvulsants

These medicines control epilepsy and other types of seizure disorders. They act by lessening overactive nerve impulses in the brain.

Examples of this class of medicines include phenytoin (Dilantin) and valproic acid (Dalpro).

Antihypertensives

Antihypertensives lower high blood pressure. They act by relaxing blood vessels, which makes blood flow more easily.

Examples of antihypertensives include methyldopa (Aldomet) and clonidine hydrochloride (Catapres).

Antituberculins

These drugs for tuberculosis limit the growth of bacteria or prevent tuberculosis from developing in people who have a positive tuberculin skin test.

Brand names include INH, Dow-Isoniazid, Rifadin, and Rimactane.

Calcium channel blockers

These medicines for angina (chest pain) and high blood pressure affect the movement of calcium into the cells of the heart and blood vessels, relax blood vessels, and increase the flow of blood and oxygen to the heart.

Examples of calcium channel blockers include diltiazem (Cardizem), nifedipine (Procardia), and verpamil (Isoptin).

Chlorpromazine

This tranquilizer relieves anxiety or agitation.

Examples of brand names include Thorazine and Ormazine.

Colchicine

This medicine eases the inflammation from gout and prevents attacks from recurring.

Iron

Iron is a mineral the body needs to produce red blood cells. Iron supplements are used to treat iron deficiency or iron-deficiency anemia.

Laxatives

Many forms of laxatives are available for relieving constipation.

Common brand names of laxatives include Phillips' Milk of Magnesia, Citroma, Epsom salts, Correctol, and ExLax.

Nitrates

These drugs for angina (chest pain) relax blood vessels and increase the flow of blood to the heart.

Examples of generic and brand names include isosorbide dinitrate (Iso-Bid and Isonate) and nitroglycerin (Nitro-Bid and Nitrocap).

Nonsteroidal anti-inflammatory drugs (NSAIDs)

These drugs block the body's production of prostaglandins, substances that mediate pain and inflammation. NSAIDs relieve the pain from chronic and acute inflammatory conditions, including arthritis and other rheumatic conditions, and pain associated with injuries, bursitis, tendinitis, and dental problems. NSAIDs also relieve pain associated with noninflammatory conditions.

Generic and brand names of NSAIDs include aspirin (Bayer and Bufferin), ibuprofen (Advil, Nuprin, and Motrin), tometin (Tolectin), naproxen (Naprosyn), and piroxicam (Feldene).

Potassium chloride

Potassium is a vital element in the body. Potassium supplements help prevent and treat potassium deficiency in people taking diuretics.

Quinidine

This medicine often is used to correct irregular heartbeat.

Brand names of quinidine include Quinalan and Quiniglute.

Theophylline

This medicine eases breathing difficulties associated with emphysema, bronchitis, and bronchial asthma. The medicine works by relaxing the muscles of the respiratory tract, which allows an easier flow of air into the lungs.

Examples of brand names include Theo-Dur, Theophyl, and Bronkodyl.

Vitamins

Vitamins serve as nutritional supplements in people with poor diets, in people recovering from surgery, or in people with special health problems.

- **Niacin** helps the body break down food for energy and is used to treat niacin deficiency and to lower levels of fats and cholesterol.
- **Vitamin A** is necessary for normal growth and for healthy

eyes and skin.
- **Vitamin C** is necessary for healthy function of cells.

Additional Readings

AARP Pharmacy Service Prescription Drug Handbook. Glenview, Illinois: Scott, Foreman and Company, 1988. General reference book for the public by the American Association of Retired Persons that provides information about medicines most frequently prescribed for persons over 50 years of age.

Advice for the Patient: Drug Information in Lay Language, USP DI, 12th edition. Rockville, Maryland: The United States Pharmacopeial Convention, 1992. Guide for the patient that provides information about medicines by brand and generic names in sections on dosage forms, proper use directions, precautions, and side effects.

Drug Information for the Health Care Professional, USP DI, 12th edition. Rockville, Maryland: The United States Pharmacopeial Convention, 1992. Guide for health care professionals that provides information about medicines by brand and generic names in sections on pharmacology, indications, precautions, side effects, general dosing, dosage forms, and patient consultation.

Kimmey, MG. Gastroduodenal effects of nonsteroidal anti-inflammatory drugs. *Postgraduate Medicine,* 1989; 85(5): 65-71. General review article for primary care physicians.

Physicians' Desk Reference, 46th edition. Montvale, New Jersey: Medical Economics Company, Inc., 1992. Reference book for health care professionals that includes information about 2,800 pharmaceutical products in sections on pharmacology, indications, contraindications, precautions, adverse reactions, and dosage and administration.

Stehlin, D. How to take your medicine: nonsteroidal anti-inflammatory drugs. *FDA Consumer,* 1990; 24(5): 33-35. General review article for the public.

Additional Resources

National Council on Patient Information and Education
666 11th Street NW., Suite 810
Washington, DC 20001
(202) 347-6711

Distributes resources to the public and health care professionals about prescription medicines.

The United States Pharmacopeial Convention, Inc.
12601 Twinbrook Parkway
Rockville, MD 20852

(301) 881-0666

Distributes information about drug use and drug standards to health professionals and the public.

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