

Constipation

National Digestive Diseases Information Clearinghouse



National Institute of
Diabetes and Digestive
and Kidney Diseases

What is constipation?

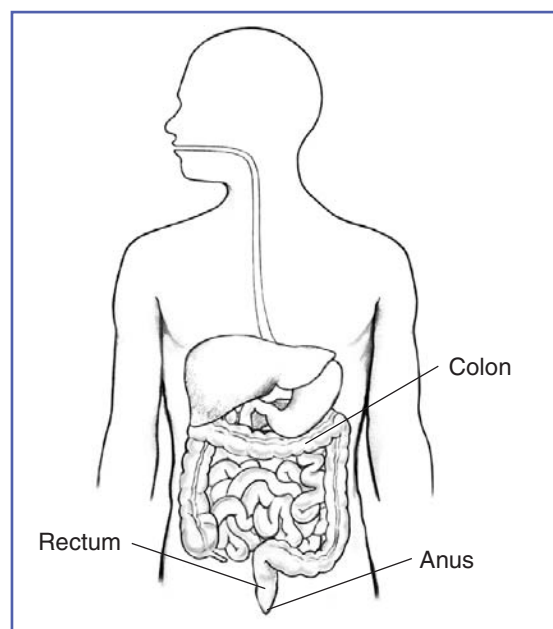
Constipation is a condition in which a person has fewer than three bowel movements a week or has bowel movements with stools that are hard, dry, and small, making them painful or difficult to pass. People may feel bloated or have pain in their abdomen—the area between the chest and hips. Some people think they are constipated if they do not have a bowel movement every day. Bowel movements may occur three times a day or three times a week, depending on the person.

Most people get constipated at some point in their lives. Constipation can be acute, which means sudden and lasting a short time, or chronic, which means lasting a long time, even years. Most constipation is acute and not dangerous. Understanding the causes, prevention, and treatment of constipation can help many people take steps to find relief.

What is the gastrointestinal (GI) tract?

The GI tract is a series of hollow organs joined in a long, twisting tube from the mouth to the anus. The body digests food using the movement of muscles in the GI tract, along with the release of hormones and enzymes. Organs that make up the GI tract are the mouth, esophagus, stomach, small intestine, large intestine—which includes the appendix, cecum, colon, and rectum—and anus. The intestines are sometimes called the bowel. The last part of the GI tract—called the lower GI tract—consists of the large intestine and anus.

The large intestine absorbs water and any remaining nutrients from partially digested food passed from the small intestine. The large intestine then changes waste from liquid to a solid matter called stool. Stool passes from the colon to the rectum. The rectum is located between the last part of the colon—called the sigmoid colon—and the anus. The rectum stores stool prior to a bowel movement. During a bowel movement, stool moves from the rectum to the anus, the opening through which stool leaves the body.



The lower GI tract

How common is constipation and who is affected?

Constipation is one of the most common GI problems in the United States, affecting an estimated 42 million people, or 15 percent of the population. People of any age, race, or gender can get constipated. Those reporting constipation most often are women, adults ages 65 and older, non-Caucasians, and people in lower socioeconomic classes.¹ Constipation is also a common problem during pregnancy, following childbirth or surgery, or after taking medications to relieve pain from things such as a broken bone, tooth extraction, or back pain. In 2004, 6.3 million outpatient visits were due to constipation and 5.3 million prescriptions for constipation medications were written.²

What causes constipation?

Constipation is caused by stool spending too much time in the colon. The colon absorbs too much water from the stool, making it hard and dry. Hard, dry stool is more difficult for the muscles of the rectum to push out of the body.

Common factors or disorders that lead to constipation are

- diets low in fiber
- lack of physical activity
- medications
- life changes or daily routine changes
- ignoring the urge to have a bowel movement

¹Higgins PD, Johanson JF. Epidemiology of constipation in North America: a systematic review. *American Journal of Gastroenterology*. 2004;99:750–759.

²Everhart JE, ed. *The Burden of Digestive Diseases in the United States*. Bethesda, MD: National Institute of Diabetes and Digestive and Kidney Diseases, U.S. Dept. of Health and Human Services; 2008. NIH Publication 09–6433.

- neurological and metabolic disorders
- GI tract problems
- functional GI disorders

Diets Low in Fiber

The most common cause of constipation is a diet with too little fiber. Fiber is a substance in foods that comes from plants. Fiber helps stool stay soft so it moves smoothly through the colon. Liquids such as water and juice help fiber to be more effective.

Older adults commonly do not get enough fiber in their diets. They may lose interest in eating because food does not taste the same as it once did, they do not feel hungry as often, they do not want to cook, or they have problems with chewing or swallowing. These factors may lead an older adult to choose foods that are quick to make or buy, such as fast foods or prepared foods, which are often low in fiber.

Lack of Physical Activity

A lack of physical activity can lead to constipation, although scientists do not know why. For example, constipation often occurs after an accident or during an illness when a person must stay in bed and cannot exercise. Lack of physical activity is thought to be one of the reasons constipation is common in older adults.

Medications

Medications that can cause constipation include

- pain medications, especially narcotics
- antacids that contain aluminum and calcium
- calcium channel blockers, which are used to treat high blood pressure and heart disease

- medications that treat Parkinson’s disease—a disorder that affects nerve cells in a part of the brain that controls muscle movement—because these medications also affect the nerves in the colon wall
- antispasmodics—medications that prevent sudden muscle contractions
- some antidepressants
- iron supplements
- diuretics—medications that help the kidneys remove fluid from the blood
- anticonvulsants—medications that decrease abnormal electrical activity in the brain to prevent seizures

Constipation can also be caused by overuse of over-the-counter laxatives. A laxative is medication that loosens stool and increases bowel movements. Although people may feel relief when they use laxatives, they usually must increase the dose over time because the body grows reliant on laxatives to have a bowel movement. Overuse of laxatives can decrease the colon’s natural ability to contract and make constipation worse. Continued overuse of laxatives can damage nerves, muscles, and tissues in the large intestine.

Life Changes or Daily Routine Changes

During pregnancy, women may be constipated because of hormonal changes or because the uterus compresses the intestine. Aging can affect bowel regularity, because of a gradual loss of nerves stimulating the muscles in the colon, which results in less intestinal activity. People can also become constipated while traveling, because their normal diet and daily routine are disrupted.

Ignoring the Urge to Have a Bowel Movement

People who ignore the urge to have a bowel movement may eventually stop feeling the need to have one, which can lead to constipation. Some people delay having a bowel movement because they do not want to use toilets outside their home, particularly public restrooms, or they feel they are too busy.

Neurological and Metabolic Disorders

Certain neurological and metabolic disorders can cause food to pass through the digestive system too slowly, leading to constipation. Neurological disorders, such as spinal cord injury and parkinsonism, affect the brain and spine. Parkinsonism is any condition that leads to the types of movement changes seen in Parkinson’s disease. Metabolic disorders, such as diabetes and hypothyroidism, disrupt the process the body uses to get energy from food. Hypothyroidism is a disorder that causes the body to produce too little thyroid hormone, which can cause many of the body’s functions to slow down.

GI Tract Problems

Some problems in the GI tract can compress or narrow the colon and rectum, causing constipation. These problems include

- adhesions—bands of tissue that can connect the loops of the intestines to each other, which may block food or stool from moving through the GI tract
- diverticulosis—a condition that occurs when small pouches, or sacs, form and push outward through weak spots in the colon wall; the pouches are called diverticula

- colon polyps—growths on the surface of the colon that can be raised or flat
- tumors—abnormal masses of tissue that result when cells divide more than they should or do not die when they should
- celiac disease—an immune reaction to gluten, a protein found in wheat, rye, and barley, that causes damage to the lining of the small intestine and prevents absorption of nutrients

Read more about the Celiac Disease Awareness Campaign at www.celiac.nih.gov.

Functional GI Disorders

Functional GI disorders are problems caused by changes in how the GI tract works. People with a functional GI disorder have frequent symptoms; however, the GI tract does not become damaged. Functional constipation often results from problems with muscle activity in the colon or anus that delay stool movement.

Functional constipation is diagnosed in people who have had symptoms for at least 6 months and meet the following criteria for the last 3 months before diagnosis:³

- Two or more of the following symptoms:
 - straining to have a bowel movement at least 25 percent of the time
 - having lumpy or hard stools at least 25 percent of the time
 - feeling as though stool is still in the rectum after a bowel movement at least 25 percent of the time

- feeling as though something is blocking stool from passing at least 25 percent of the time
- using their fingers to help with stool passage at least 25 percent of the time
- having fewer than three bowel movements per week
- Rarely passing loose stools without the use of laxatives
- Not having irritable bowel syndrome (IBS)

IBS is a functional GI disorder with symptoms that include abdominal pain or discomfort, often reported as cramping, along with diarrhea, constipation, or both. Read more in *Irritable Bowel Syndrome* at www.digestive.niddk.nih.gov.

How is the cause of constipation diagnosed?

To diagnose the cause of constipation, the health care provider will take a medical history, perform a physical exam, and order specific tests. The tests ordered depend on how long the person has been constipated; how severe the constipation is; the person's age; and whether the person has had blood in stools, recent changes in bowel habits, or weight loss. Most people with constipation do not need extensive testing and can be treated with changes in diet and exercise.

³Longstreth GF, Thompson WG, Chey WD, et al. Functional bowel disorders. In: Drossman DA, ed. *Rome III: The Functional Gastrointestinal Disorders*. 3rd ed. Lawrence, KS: Allen Press, Inc.; 2006: 515–523.

Medical History

The health care provider may ask questions about the person's constipation, including how long symptoms have been present, frequency of bowel movements, consistency of stools, and presence of blood in the stool. The health care provider may ask questions about the person's eating habits, medication, and level of physical activity. A record of this information can be prepared before the visit to help the health care provider make a diagnosis.

Physical Exam

A physical exam should include a rectal exam with a gloved, lubricated finger to evaluate the tone of the muscle that closes off the anus—called the anal sphincter—and to detect tenderness, obstruction, or blood. The health care provider may perform a test for blood in the stool by placing a small sample of the person's stool on a paper card and adding a drop or two of testing solution. A color change is a sign of blood in the stool.

Diagnostic Tests

Additional testing is usually reserved for older adults and people with severe symptoms, sudden changes in the number and consistency of bowel movements, or blood in the stool. Additional tests that may be used to evaluate constipation include

- blood test
- lower GI series
- flexible sigmoidoscopy or colonoscopy
- colorectal transit studies
- anorectal function tests
- defecography

Blood test. A blood test involves drawing blood at a health care provider's office or a commercial facility and sending it to a lab for analysis. The blood test can show if there may be an underlying disease or condition causing constipation. For example, low levels of thyroid hormone may indicate hypothyroidism.

Lower GI series. A lower GI series is an x-ray exam that is used to look at the large intestine. The test is performed at a hospital or an outpatient center by a radiologist—a doctor who specializes in medical imaging. The health care provider may give the person written bowel prep instructions to follow at home. The person may be asked to follow a clear liquid diet for 1 to 3 days before the procedure. A laxative or an enema may be used before the test. An enema involves flushing water or laxative into the anus using a special squirt bottle. The medications cause diarrhea, so the person should stay close to a bathroom during the bowel prep.

For the test, the person will lie on a table while the radiologist inserts a flexible tube into the person's anus. The large intestine is filled with barium, a chalky liquid, making signs of problems that may be causing constipation show up more clearly on x rays.

For several days, traces of barium in the large intestine cause stools to be white or light colored. Enemas and repeated bowel movements may cause anal soreness. A health care provider will provide specific instructions about eating and drinking after the test.

Flexible sigmoidoscopy or colonoscopy. The tests are similar, but a colonoscopy is used to view the rectum and entire colon, while a flexible sigmoidoscopy is used to view just the rectum and lower colon. These tests are performed at a hospital or an outpatient center by a gastroenterologist—a doctor who specializes in digestive diseases. For both tests, a health care provider will give written bowel prep instructions to follow at home. The person may be asked to follow a clear liquid diet for 1 to 3 days before either test. The night before both tests, the person may need to take a laxative. One or more enemas may also be required the night before and about 2 hours before both tests.

In most cases, light anesthesia, and possibly pain medication, is used during a flexible sigmoidoscopy or colonoscopy. For either test, the person will lie on a table while the gastroenterologist inserts a flexible tube into the anus. A small camera on the tube sends a video image of the intestinal lining to a computer screen. The test can show signs of problems in the lower GI tract.

The gastroenterologist may also perform a biopsy, a procedure that involves taking a small piece of intestinal lining tissue for examination with a microscope. The person will not feel the biopsy. A pathologist—a doctor who specializes in diagnosing diseases—examines the tissue in a lab.

Cramping or bloating may occur during the first hour after the test. Driving is not permitted for 24 hours after a flexible sigmoidoscopy or colonoscopy to allow the sedative time to wear off. Before the appointment, a person should make plans for a ride home. Full recovery is expected by the next day.

Colorectal transit studies. These tests show how well food moves through the colon.

- **Radiopaque markers.** With this technique, the person swallows capsules containing small markers that are visible on an x ray. The markers move through the GI tract just as food and waste do and are passed naturally with stool. During the course of this test, the person eats a high-fiber diet to help stool move through the GI tract. Three to 7 days after the person swallows the capsules, abdominal x rays, taken several times, monitor the movement of the markers through the colon. An x-ray technician takes the x rays in a hospital radiology department or health care provider's office, and a radiologist interprets the x rays.
- **Scintigraphy.** This type of nuclear medicine study relies on the detection of small amounts of radiation after a person eats a meal containing radioactive chemicals. The dose of the radioactive chemicals is small; therefore, scintigraphy is not likely to cause damage to cells. Special external cameras and computers are used to create images of the radioactive chemicals as they move through the intestine. To prepare for the test, the person may need to stop taking some medications and should not eat any food after midnight the night before the test. Scintigraphy is done as an outpatient procedure by a specially trained technician, and a radiologist interprets the results.

Anorectal function tests. These tests diagnose constipation caused by anorectal dysfunction, which refers to problems with the anus and rectum. To prepare for these

tests, the person should use an enema and not eat anything 2 hours prior to the test. Anesthesia is not needed for these tests.

- **Anal manometry** uses pressure sensors and a balloon that can be inflated in the rectum to check the sensitivity and function of the rectum. Anal manometry also checks the tightness of the anal sphincter muscles around the anus. For this test, a thin tube with a balloon on its tip and pressure sensors below the balloon is inserted into the anus until the balloon is in the rectum and pressure sensors are inside the anus. The tube is slowly pulled back through the sphincter muscle to measure muscle tone and contractions. The test takes about 30 minutes.
- **Balloon expulsion tests** consist of filling a balloon with varying amounts of water after it has been inserted into the rectum. The person is given a stopwatch and instructed to go to the restroom and measure the amount of time it takes to expel the balloon. If the person cannot expel a balloon filled with less than 150 milliliters of water or it takes longer than 1 minute to expel the balloon, the person may have a decrease in function for evacuation of stool.

Defecography. This x ray of the anorectal area shows how well the person can hold and evacuate stool. The test also identifies structural changes in the rectum and anus, such as rectocele and rectal prolapse. Rectocele is a condition in which the rectum protrudes through the vagina, and rectal prolapse is a condition in which the rectum drops down through the anus. To prepare for the test, the person uses two enemas and does not eat anything 2 hours prior to the test. During the test, the health care provider fills the rectum with a soft paste that shows up on x rays and is the same consistency as stool. The person sits on a

toilet inside an x-ray machine. The person is first asked to pull in and squeeze the sphincter muscles to prevent leakage. Then the person is asked to strain to have a bowel movement. The radiologist studies the x rays for anorectal problems that occurred as the paste was expelled.

How is constipation treated?

Treatment for constipation depends on the cause, severity, and duration of the constipation and may include one or more of the following:

- changes in eating, diet, and nutrition
- exercise and lifestyle changes
- medication
- surgery
- biofeedback

First-line treatments for constipation include changes in eating, diet, and nutrition; exercise and lifestyle changes; and laxatives. People who do not respond to these first-line treatments should talk with their health care provider about other treatments.

Eating, Diet, and Nutrition

The Academy of Nutrition and Dietetics recommends consuming 20 to 35 grams of fiber a day for adults. Americans consume only 15 grams a day on average.⁴ People often eat too many refined and processed foods from which the natural fiber has been removed. A health care provider can help plan a diet with the appropriate amount of fiber. A list of high-fiber foods is shown on page 8. People prone to constipation should limit foods that have little or no fiber, such as ice cream, cheese, meat, and processed foods.

⁴Slavin JL. Position of the American Dietetic Association: health implications of dietary fiber. *Journal of the American Dietetic Association*. 2008;108:1716–1731.

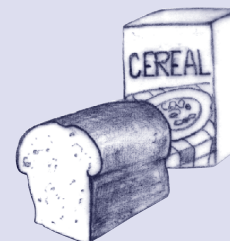
Examples of Foods That Have Fiber

Beans, cereals, and breads

- 1/2 cup of beans (navy, pinto, kidney, etc.), cooked
- 1/2 cup of shredded wheat, ready-to-eat cereal
- 1/3 cup of 100% bran, ready-to-eat cereal
- 1 small oat bran muffin
- 1 whole-wheat English muffin

Fiber

- 6.2–9.6 grams
- 2.7–3.8 grams
- 9.1 grams
- 3.0 grams
- 4.4 grams



Fruits

- 1 small apple, with skin
- 1 medium pear, with skin
- 1/2 cup of raspberries
- 1/2 cup of stewed prunes

- 3.6 grams
- 5.5 grams
- 4.0 grams
- 3.8 grams



Vegetables

- 1/2 cup of winter squash, cooked
- 1 medium sweet potato, baked in skin
- 1/2 cup of green peas, cooked
- 1 small potato, baked, with skin
- 1/2 cup of mixed vegetables, cooked
- 1/2 cup of broccoli, cooked
- 1/2 cup of greens (spinach, collards, turnip greens), cooked

- 2.9 grams
- 3.8 grams
- 3.5–4.4 grams
- 3.0 grams
- 4.0 grams
- 2.6–2.8 grams
- 2.5–3.5 grams



Source: U.S. Department of Agriculture and U.S. Department of Health and Human Services, *Dietary Guidelines for Americans, 2010*.

Drinking water and other liquids, such as fruit and vegetable juices and clear soups, may make fiber in the diet more effective in normalizing bowel function and maintaining regularity. A health care provider can give advice about how much a person should drink each day based on the person's health and activity level and where the person lives.

Exercise and Lifestyle Changes

Engaging in daily exercise can help people with constipation. Another strategy is to try to have a bowel movement at the same time each day. The best time is 15 to 45 minutes after breakfast because eating helps stimulate the colon. People with constipation should reserve enough time to have a bowel movement and be sure not to ignore the urge to have a bowel movement.

Medication

When a medication is causing constipation, the health care provider may suggest the person stop taking the medication or switch to a different medication.

Laxative medications and enemas may be recommended for people who have made diet and lifestyle changes and are still constipated. Laxatives taken by mouth are available in liquid, tablet, powder, and granule forms.

- **Bulk-forming agents.** Brand names include Metamucil, FiberCon, Citrucel, Konsyl, and Serutan. Bulk-forming agents absorb fluid in the intestines, making stools bulkier, which helps trigger the bowel to contract and push stool out. These supplements should be taken with water or they can cause obstruction. Bulk-forming agents are generally considered the safest laxative, but they can interfere with the absorption of some medications. Many people also report no relief after taking bulk-forming agents and suffer from bloating and abdominal pain.
- **Osmotic agents.** Brand names include Milk of Magnesia, Fleet Phospho-Soda, Cephulac, Sorbitol, and Miralax. Osmotic agents help stool retain fluid, increasing the number of bowel movements and softening the stool. These laxatives are usually used by people who are bedridden or cannot take bulk-forming agents. Older adults and people with heart or kidney failure should be careful when taking osmotic agents because they can cause dehydration or a mineral imbalance.
- **Stool softeners.** Brand names include Colace, Docusate, and Surfak. Stool softeners help mix fluid into stools

to soften them. Stool softeners may be suggested for people who should avoid straining in order to pass a bowel movement; they are often recommended after childbirth or surgery.

- **Lubricants.** Brand names include Fleet and Zymenol. Lubricants work by coating the surface of stool, which helps the stool hold in fluid and pass more easily. Lubricants are simple, inexpensive laxatives that may be recommended for people with anorectal blockage.

Other types of laxatives include

- **Stimulants.** Brand names include Correctol, Dulcolax, Purge, and Senokot. Stimulant laxatives cause the intestines to contract, which moves stool. Stimulants should be reserved for constipation that is severe or has not responded to other treatments. People should not use stimulant laxatives containing phenolphthalein, as phenolphthalein may increase the likelihood of cancer. Most laxatives sold in the United States do not contain phenolphthalein.
- **Chloride channel activators.** Lubiprostone (Amitiza) is a chloride channel activator available with a prescription. This type of laxative increases fluid in the GI tract. Lubiprostone has been shown to be safe when used for 6 to 12 months.

People who depend on laxatives to have a bowel movement need to talk with their health care provider about how to slowly stop using them. For most people, stopping laxatives restores the colon's natural ability to contract.

Surgery

Surgery may be needed to correct an anorectal blockage caused by rectal prolapse. Surgical removal of the colon may be an option for people whose colon muscles do not work properly, causing severe symptoms that do not respond to treatment. However, the benefits of this surgery should be weighed against possible complications, which include abdominal pain and diarrhea.

Biofeedback

People with chronic constipation caused by problems with the anorectal muscles can use biofeedback to retrain the muscles. Biofeedback uses special sensors to measure bodily functions. The measurements are displayed on a video screen as line graphs and sounds indicate when the person is using the correct muscles. The health care provider uses the information to help the person modify or change abnormal function. The person practices at home. The person may need to continue practicing for 3 months to get the most benefit from the training.

What are the complications of constipation?

Sometimes constipation can lead to complications, such as hemorrhoids, anal fissures, rectal prolapse, and fecal impaction.

Hemorrhoids are swollen and inflamed veins around the anus or in the lower rectum that can be caused by straining to have a bowel movement. People with hemorrhoids may have rectal bleeding that appears bright red on the surface of stool, on toilet paper, or in the toilet after a bowel

movement. Treatment for hemorrhoids may include making dietary changes to prevent constipation, taking warm tub baths, and applying special cream to the affected area or using suppositories before bedtime. Hemorrhoids that do not respond to at-home treatments can be treated by a health care provider. Read more in *Hemorrhoids* at www.digestive.niddk.nih.gov.

Anal fissures are small tears in the anus that may cause itching, pain, or bleeding. Treatment for anal fissures may include making dietary changes to prevent constipation, applying cream to numb the area or relax the muscles, using stool softeners, or taking warm tub baths. Anal fissures that do not respond to at-home treatment can be treated with minor surgery.

Rectal prolapse can be caused by straining during bowel movements. The condition may lead to mucus leaking from the anus. Eliminating the cause of the prolapse, such as straining or coughing, is usually the only treatment needed. Severe or chronic prolapse requires surgery to strengthen and tighten the anal sphincter muscle or to repair the prolapsed lining.

Fecal impaction occurs when hard stool packs the intestine and rectum so tightly that the normal pushing action of the colon is not enough to expel the stool. This condition occurs most often in children and older adults. An impaction can be softened with mineral oil taken by mouth or through an enema. After softening the impaction, the health care provider may break up and remove part of the hardened stool by inserting one or two fingers into the anus.

Points to Remember

- Constipation is a condition in which a person has fewer than three bowel movements a week or has bowel movements with stools that are hard, dry, and small, making them painful or difficult to pass.
- Most people get constipated at some point in their lives. Most constipation is acute and not dangerous.
- Common causes of constipation are
 - diets low in fiber
 - lack of physical activity
 - medications
 - life changes or daily routine changes
 - ignoring the urge to have a bowel movement
 - neurological and metabolic disorders
 - gastrointestinal (GI) tract problems
 - functional GI disorders
- To diagnose the cause of constipation, the health care provider will take a medical history, perform a physical exam, and order specific tests.
- Treatment for constipation depends on the cause, severity, and duration of the constipation and may include one or more of the following:
 - changes in eating, diet, and nutrition
 - exercise and lifestyle changes
 - medication
 - surgery
 - biofeedback

Hope through Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and other components of the National Institutes of Health (NIH) conduct and support basic and clinical research into many digestive disorders, including constipation.

Clinical trials are research studies involving people. Clinical trials look at safe and effective new ways to prevent, detect, or treat disease. Researchers also use clinical trials to look at other aspects of care, such as improving the quality of life for people with chronic illnesses. To learn more about clinical trials, why they matter, and how to participate, visit the NIH Clinical Research Trials and You website at www.nih.gov/health/clinicaltrials. For information about current studies, visit www.ClinicalTrials.gov.

For More Information

American Gastroenterological Association

4930 Del Ray Avenue
Bethesda, MD 20814
Phone: 301-654-2055
Fax: 301-654-5920
Email: member@gastro.org
Internet: www.gastro.org

American Neurogastroenterology and Motility Society

45685 Harmony Lane
Belleville, MI 48111
Phone: 734-699-1130
Fax: 734-699-1136
Email: admin@motilitysociety.org
Internet: www.motilitysociety.org

International Foundation for Functional Gastrointestinal Disorders

700 West Virginia Street, Suite 201
Milwaukee, WI 53204
Phone: 1-888-964-2001 or 414-964-1799
Fax: 414-964-7176
Email: iffgd@iffgd.org
Internet: www.iffgd.org

Acknowledgments

Publications produced by the Clearinghouse are carefully reviewed by both NIDDK scientists and outside experts. This publication was reviewed by Michael Camilleri, M.D., Mayo Clinic.

You may also find additional information about this topic by visiting MedlinePlus at www.medlineplus.gov.

This publication may contain information about medications and, when taken as prescribed, the conditions they treat. When prepared, this publication included the most current information available. For updates or for questions about any medications, contact the U.S. Food and Drug Administration toll-free at 1-888-INFO-FDA (1-888-463-6332) or visit www.fda.gov. Consult your health care provider for more information.

The U.S. Government does not endorse or favor any specific commercial product or company. Trade, proprietary, or company names appearing in this document are used only because they are considered necessary in the context of the information provided. If a product is not mentioned, the omission does not mean or imply that the product is unsatisfactory.

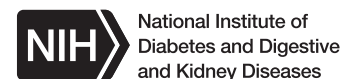
National Digestive Diseases Information Clearinghouse

2 Information Way
Bethesda, MD 20892-3570
Phone: 1-800-891-5389
TTY: 1-866-569-1162
Fax: 703-738-4929
Email: nddic@info.niddk.nih.gov
Internet: www.digestive.niddk.nih.gov

The National Digestive Diseases Information Clearinghouse (NDDIC) is a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). The NIDDK is part of the National Institutes of Health of the U.S. Department of Health and Human Services. Established in 1980, the Clearinghouse provides information about digestive diseases to people with digestive disorders and to their families, health care professionals, and the public. The NDDIC answers inquiries, develops and distributes publications, and works closely with professional and patient organizations and Government agencies to coordinate resources about digestive diseases.

This publication is not copyrighted. The Clearinghouse encourages users of this publication to duplicate and distribute as many copies as desired.

This publication is available at www.digestive.niddk.nih.gov.



NIH Publication No. 13-2754
September 2013