

Irritable Bowel Syndrome

National Digestive Diseases Information Clearinghouse



U.S. Department
of Health and
Human Services

NATIONAL
INSTITUTES
OF HEALTH



What is irritable bowel syndrome (IBS)?

Irritable bowel syndrome is a functional gastrointestinal (GI) disorder, meaning it is a problem caused by changes in how the GI tract works. People with a functional GI disorder have frequent symptoms, but the GI tract does not become damaged. IBS is not a disease; it is a group of symptoms that occur together. The most common symptoms of IBS are abdominal pain or discomfort, often reported as cramping, along with diarrhea, constipation, or both. In the past, IBS was called colitis, mucous colitis, spastic colon, nervous colon, and spastic bowel. The name was changed to reflect the understanding that the disorder has both physical and mental causes and is not a product of a person's imagination.

IBS is diagnosed when a person has abdominal pain or discomfort at least three times per month for the last 3 months without other disease or injury that could explain the pain. The pain or discomfort of IBS may occur with a change in stool frequency or consistency or may be relieved by a bowel movement.

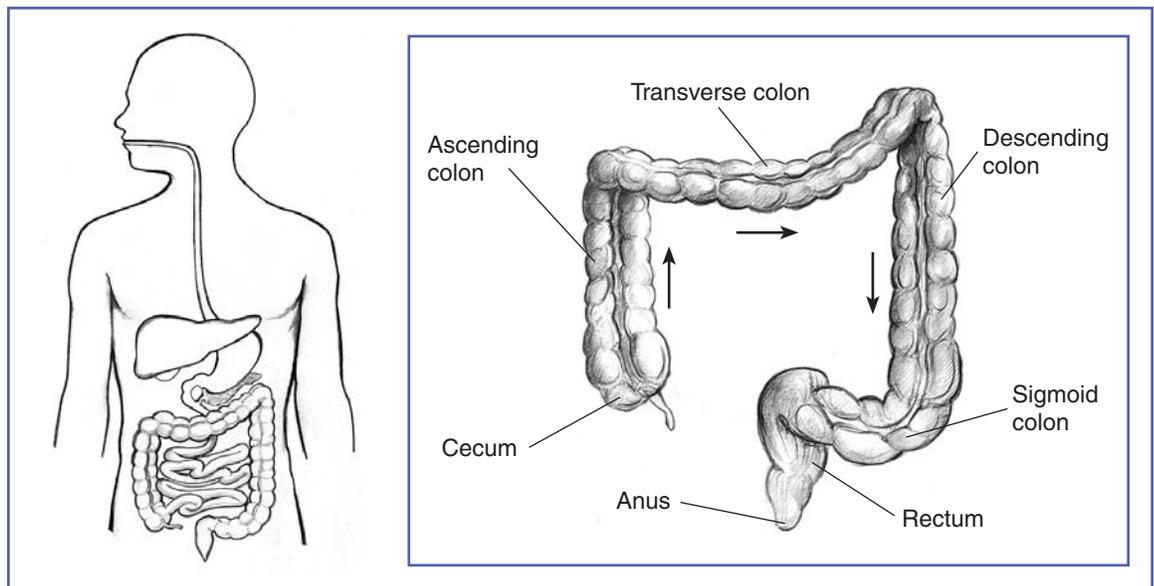
IBS is often classified into four subtypes based on a person's usual stool consistency. These subtypes are important because they affect the types of treatment that are most likely to improve the person's symptoms. The four subtypes of IBS are

- IBS with constipation (IBS-C)
 - hard or lumpy stools at least 25 percent of the time
 - loose or watery stools less than 25 percent of the time
- IBS with diarrhea (IBS-D)
 - loose or watery stools at least 25 percent of the time
 - hard or lumpy stools less than 25 percent of the time
- Mixed IBS (IBS-M)
 - hard or lumpy stools at least 25 percent of the time
 - loose or watery stools at least 25 percent of the time
- Unsubtyped IBS (IBS-U)
 - hard or lumpy stools less than 25 percent of the time
 - loose or watery stools less than 25 percent of the time

What is the GI tract?

The GI tract is a series of hollow organs joined in a long, twisting tube from the mouth to the anus. The movement of muscles in the GI tract, along with the release of hormones and enzymes, allows for the digestion of food. 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 IBS and who is affected?

Irritable bowel syndrome is estimated to affect 3 to 20 percent of the population, with most studies ranging from 10 to 15 percent.¹ However, less than one-third of people with the condition see a health care provider for diagnosis.² IBS affects about twice as many women as men and is most often found in people younger than 45 years.¹

What are the symptoms of IBS?

The symptoms of IBS include abdominal pain or discomfort and changes in bowel habits. To meet the definition of IBS, the pain or discomfort should be associated with two of the following three symptoms:

- start with bowel movements that occur more or less often than usual
- start with stool that appears looser and more watery or harder and more lumpy than usual
- improve with a bowel movement

Other symptoms of IBS may include

- diarrhea—having loose, watery stools three or more times a day and feeling urgency to have a bowel movement
- constipation—having hard, dry stools; three or fewer bowel movements in a week; or straining to have a bowel movement

- feeling that a bowel movement is incomplete
- passing mucus, a clear liquid made by the intestines that coats and protects tissues in the GI tract
- abdominal bloating

Symptoms may often occur after eating a meal. To meet the definition of IBS, symptoms must occur at least 3 days a month.

What causes IBS?

The causes of IBS are not well understood. Researchers believe a combination of physical and mental health problems can lead to IBS. The possible causes of IBS include the following:

- **Brain-gut signal problems.** Signals between the brain and nerves of the small and large intestines, also called the gut, control how the intestines work. Problems with brain-gut signals may cause IBS symptoms, such as changes in bowel habits and pain or discomfort.
- **GI motor problems.** Normal motility, or movement, may not be present in the colon of a person who has IBS. Slow motility can lead to constipation and fast motility can lead to diarrhea. Spasms, or sudden strong muscle contractions that come and go, can cause abdominal pain. Some people with IBS also experience hyperreactivity, which is an excessive increase in contractions of the bowel in response to stress or eating.

¹Grundmann O, Yoon SL. Irritable bowel syndrome: epidemiology, diagnosis, and treatment: an update for health-care practitioners. *Journal of Gastroenterology and Hepatology*. 2010;25:691–699.

²Owyang C. Irritable bowel syndrome. In: Yamada T, ed. *Textbook of Gastroenterology*. 5th ed. Vol. 1. West Sussex, UK: John Wiley & Sons Ltd.; 2009: 1536–1573.

- **Hypersensitivity.** People with IBS have a lower pain threshold to stretching of the bowel caused by gas or stool compared with people who do not have IBS. The brain may process pain signals from the bowel differently in people with IBS.
- **Mental health problems.** Mental health, or psychological, problems such as panic disorder, anxiety, depression, and post-traumatic stress disorder are common in people with IBS. The link between these disorders and development of IBS is unclear. GI disorders, including IBS, are often found in people who have reported past physical or sexual abuse. Researchers believe people who have been abused tend to express psychological stress through physical symptoms.
- **Bacterial gastroenteritis.** Some people who have bacterial gastroenteritis—an infection or irritation of the stomach and intestines caused by bacteria—develop IBS. Researchers do not know why gastroenteritis leads to IBS in some people and not others, though psychological problems and abnormalities of the lining of the GI tract may be factors.
- **Small intestinal bacterial overgrowth (SIBO).** Normally, few bacteria live in the small intestine. SIBO is an increase in the number of bacteria or a change in the type of bacteria in the small intestine. These bacteria can produce excess gas and may also cause diarrhea and weight loss. Some researchers believe that SIBO may lead to IBS, and some studies have shown antibiotics to be effective in treating IBS. However, the studies were weak and more research is needed to show a link between SIBO and IBS.
- **Body chemicals.** People with IBS have altered levels of neurotransmitters, which are chemicals in the body that transmit nerve signals, and GI hormones, though the role these chemicals play in developing IBS is unclear. Younger women with IBS often have more symptoms during their menstrual periods. Post-menopausal women have fewer symptoms compared with women who are still menstruating. These findings suggest that reproductive hormones can worsen IBS problems.
- **Genetics.** Whether IBS has a genetic cause, meaning it runs in families, is unclear. Studies have shown that IBS is more common in people with family members who have a history of GI problems. However, the cause could be environmental or the result of heightened awareness of GI symptoms.
- **Food sensitivity.** Many people with IBS report that certain foods and beverages can cause symptoms, such as foods rich in carbohydrates, spicy or fatty foods, coffee, and alcohol. However, people with food sensitivity typically do not have clinical signs of food allergy. Researchers have proposed that symptoms may result from poor absorption of sugars or bile acids, which help break down fats and get rid of wastes in the body.

How is IBS diagnosed?

To diagnose IBS, a health care provider will conduct a physical exam and take a complete medical history. The medical history will include questions about symptoms, family history of GI disorders, recent infections, medications, and stressful events related to the onset of symptoms. For IBS to be diagnosed, the symptoms must have started at least 6 months prior and must have occurred at least 3 days per month for the previous 3 months. Further testing is not usually needed, though the health care provider may do a blood test to screen for other problems. Additional diagnostic tests may be needed based on the results of the screening blood test and for people who also have signs such as

- fever
- rectal bleeding
- weight loss
- anemia—too few red blood cells in the body, which prevents the body from getting enough oxygen
- family history of colon cancer, irritable bowel disease—long-lasting disorders that cause irritation and ulcers, or sores, in the GI tract—or celiac disease—an immune disease in which people cannot tolerate gluten, a protein found in wheat, rye, and barley, because it will damage the lining of their small intestine and prevent absorption of nutrients

Additional diagnostic tests may include a stool test, lower GI series, and flexible sigmoidoscopy or colonoscopy. Colonoscopy may also be recommended for people who are older than 50 to screen for colon cancer.

Stool tests. A stool test is the analysis of a sample of stool. The health care provider will give the person a container for catching and storing the stool. The sample is returned to the health care provider or a commercial facility and sent to a lab for analysis. The health care provider may also do a rectal exam, sometimes during the physical exam, to check for blood in the stool. Stool tests can show the presence of parasites or blood.

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 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 enema may be used before the test. A laxative is medication that loosens stool and increases bowel movements. An enema involves flushing water or laxative into the anus using a special squirt bottle.

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, making signs of problems with the large intestine that may be causing the person's symptoms 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 and 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 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 the test, the person may need to take a laxative. One or more enemas may also be required the night before and about 2 hours before the test.

In most cases, light anesthesia, and possibly pain medication, helps people relax. 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 piece of intestinal lining for examination with a microscope. You 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 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.

How is IBS treated?

Though there is no cure for IBS, the symptoms can be treated with a combination of the following:

- changes in eating, diet, and nutrition
- medications
- probiotics
- therapies for mental health problems

Eating, Diet, and Nutrition

Large meals can cause cramping and diarrhea, so eating smaller meals more often, or eating smaller portions, may help IBS symptoms. Eating meals that are low in fat and high in carbohydrates, such as pasta, rice, whole-grain breads and cereals, fruits, and vegetables, may help.

Certain foods and drinks may cause IBS symptoms in some people, such as

- foods high in fat
- milk products
- drinks with alcohol or caffeine
- drinks with large amounts of artificial sweeteners, which are substances used in place of sugar
- foods that may cause gas, such as beans and cabbage

People with IBS may want to limit or avoid these foods. Keeping a food diary is a good way to track which foods cause symptoms so they can be excluded from or reduced in the diet.

Dietary fiber may lessen constipation in people with IBS, but it may not help with lowering pain. Fiber helps keep stool soft so it moves smoothly through the colon. The Academy of Nutrition and Dietetics recommends consuming 20 to 35 grams of fiber a day for adults.³ Fiber may cause gas and trigger symptoms in some people with IBS. Increasing fiber intake by 2 to 3 grams per day may help reduce the risk of increased gas and bloating.

Medications

The health care provider will select medications based on the person's symptoms.

- **Fiber supplements.** Fiber supplements may be recommended to relieve constipation when increasing dietary fiber is ineffective.
- **Laxatives.** Constipation can be treated with laxative medications. Laxatives work in different ways, and a health care provider can provide information about which type is best for each person. More information about different types of laxatives can be found in the National Digestive Diseases Information Clearinghouse (NDDIC) fact sheet *Constipation* at www.digestive.niddk.nih.gov.
- **Antidiarrheals.** Loperamide has been found to reduce diarrhea in people with IBS, though it does not reduce pain, bloating, or other symptoms.

Loperamide reduces stool frequency and improves stool consistency by slowing the movement of stool through the colon.

- **Antispasmodics.** Antispasmodics, such as hyoscine, cimetropium, and pinaverium, help to control colon muscle spasms and reduce abdominal pain.
- **Antidepressants.** Tricyclic antidepressants (TCAs) and selective serotonin reuptake inhibitors (SSRIs) in low doses can help relieve IBS symptoms including abdominal pain. In theory, TCAs should be better for people with IBS-D and SSRIs should be better for people with IBS-C due to the effect on colon transit, but this has not been confirmed in clinical studies. TCAs work in people with IBS by reducing sensitivity to pain in the GI tract as well as normalizing GI motility and secretion.
- **Lubiprostone (Amitiza).** Lubiprostone is prescribed for people who have IBS-C. The medication has been found to improve symptoms of abdominal pain or discomfort, stool consistency, straining, and constipation severity.

The antibiotic rifaximin can reduce abdominal bloating by treating SIBO. But scientists are still debating the use of antibiotics to treat IBS, and more research is needed.

³Slavin, JL. Position of the American Dietetic Association: health implications of dietary fiber. *Journal of the American Dietetic Association*. 2008;108:1716–1731.

Probiotics

Probiotics are live microorganisms, usually bacteria, that are similar to microorganisms normally found in the GI tract. Studies have found that probiotics, specifically *Bifidobacteria* and certain probiotic combinations, improve symptoms of IBS when taken in large enough amounts. But more research is needed. Probiotics can be found in dietary supplements, such as capsules, tablets, and powders, and in some foods, such as yogurt. A health care provider can give information about the right kind and right amount of probiotics to take to improve IBS symptoms. More information about probiotics can be found in the National Center for Complementary and Alternative Medicine fact sheet *An Introduction to Probiotics* at www.nccam.nih.gov/health/probiotics/introduction.htm.

Therapies for Mental Health Problems

The following therapies can help improve IBS symptoms due to mental health problems:

- **Talk therapy.** Talking with a therapist may reduce stress and improve IBS symptoms. Two types of talk therapy used to treat IBS are cognitive behavioral therapy and psychodynamic, or interpersonal, therapy. Cognitive behavioral therapy focuses on the person's thoughts and actions. Psychodynamic therapy focuses on how emotions affect IBS symptoms. This type of therapy often involves relaxation and stress management techniques.

- **Hypnotherapy.** In hypnotherapy, the therapist uses hypnosis to help the person relax into a trance-like state. This type of therapy may help the person relax the muscles in the colon.
- **Mindfulness training.** People practicing this type of meditation are taught to focus their attention on sensations occurring at the moment and to avoid worrying about the meaning of those sensations, also called catastrophizing.

What other conditions are associated with IBS?

People with IBS often suffer from other GI and non-GI conditions. GI conditions such as gastroesophageal reflux disease (GERD) and dyspepsia are more common in people with IBS than the general population. GERD is a condition in which stomach contents flow back up into the esophagus—the organ that connects the mouth to the stomach—because the muscle between the esophagus and the stomach is weak or relaxes when it should not. Dyspepsia, or indigestion, is upper abdominal discomfort that often occurs after eating. Dyspepsia may be accompanied by fullness, bloating, nausea, or other GI symptoms. More information about these conditions can be found in the NDDIC fact sheets *Heartburn*, *Gastroesophageal Reflux (GER)*, and *Gastroesophageal Reflux Disease (GERD)* and *Indigestion* at www.digestive.niddk.nih.gov.

Non-GI conditions often found in people with IBS include

- chronic fatigue syndrome—a disorder that causes extreme fatigue, which is tiredness that lasts a long time and limits a person’s ability to do ordinary daily activities
- chronic pelvic pain
- temporomandibular joint disorders—problems or symptoms of the chewing muscles and joints that connect the lower jaw to the skull
- depression
- anxiety
- somatoform disorders—chronic pain or other symptoms with no physical cause that are thought to be due to psychological problems

How does stress affect IBS?

Stress can stimulate colon spasms in people with IBS. The colon has many nerves that connect it to the brain. These nerves control the normal contractions of the colon and cause abdominal discomfort at stressful times. In people with IBS, the colon can be overly responsive to even slight conflict or stress. Stress makes the mind more aware of the sensations that arise in the colon. IBS symptoms can also increase a person’s stress level. Some options for managing stress include

- participating in stress reduction and relaxation therapies such as meditation
- getting counseling and support
- taking part in regular exercise such as walking or yoga
- minimizing stressful life situations as much as possible
- getting enough sleep

Points to Remember

- Irritable bowel syndrome (IBS) is a functional gastrointestinal (GI) disorder, meaning it is a problem caused by changes in how the GI tract works. People with a functional GI disorder have frequent symptoms, but the GI tract does not become damaged.
- IBS is not a disease; it is a group of symptoms that occur together.
- IBS is estimated to affect 3 to 20 percent of the population, with most studies ranging from 10 to 15 percent. However, less than one-third of people with the condition see a health care provider for diagnosis.
- The symptoms of IBS include abdominal pain or discomfort and changes in bowel habits. Other symptoms of IBS may include
 - diarrhea
 - constipation
 - feeling that a bowel movement is incomplete
 - passing mucus
 - abdominal bloating
- The causes of IBS are not well understood. Researchers believe a combination of physical and mental health problems can lead to IBS.
- To diagnose IBS, a health care provider will conduct a physical exam and take a complete medical history. The medical history will include questions about symptoms, family history of GI disorders, recent infections, medications, and stressful events related to the onset of symptoms.

- Though there is no cure for IBS, the symptoms can be treated with a combination of the following:
 - changes in eating, diet, and nutrition
 - medications
 - probiotics
 - therapies for mental health problems

Hope through Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) conducts and supports research into many kinds of digestive disorders, including IBS. The NIDDK and other components of the National Institutes of Health (NIH) are conducting clinical trials aimed at improving the diagnosis and treatment of IBS. Self Administered Cognitive Behavior Therapy for Irritable Bowel Syndrome, funded under NIH clinical trial number NCT00738920, assesses the short- and long-term efficacy of cognitive behavior therapy for IBS using two treatment delivery systems: self-administered and therapist administered. Long-term project goals include development of an effective self-administered behavioral treatment program that can enhance quality of patient care, improve clinical outcomes, and decrease the economic and personal costs of IBS.

Safety Study of Probiotics in Adults with Irritable Bowel Syndrome, funded under NIH clinical trial number NCT00971711, is a phase I study of the safety and effectiveness of VSL#3 in adults with IBS. VSL#3 is a high-potency probiotic medical food that is commercially available. Acupuncture/Moxibustion for Irritable Bowel Syndrome (Acu/MoxalIBS), funded under NIH clinical trial number NCT00945074, tests the efficacy of acupuncture in combination with moxibustion for symptom improvement in adults with IBS. Moxibustion is the application of heat from a burning herb at the acupuncture point. All participants will receive moxibustion and will be assigned to one of three treatment protocols: standard acupuncture, individualized acupuncture, and sham acupuncture.

Participants in clinical trials can play a more active role in their own health care, gain access to new research treatments before they are widely available, and help others by contributing to medical research. For information about current studies, visit www.ClinicalTrials.gov.

For More Information

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

P.O. Box 170864
Milwaukee, WI 53217-8076
Phone: 1-888-964-2001 or 414-964-1799
Fax: 414-964-7176
Email: iffgd@iffgd.org
Internet: www.iffgd.org

Rome Foundation

P.O. Box 6524
Raleigh, NC 27628
Phone: 919-345-3927
Fax: 919-900-7646
Email: mpickard@theromefoundation.org
Internet: www.romecriteria.org

Acknowledgments

Publications produced by the Clearinghouse are carefully reviewed by both NIDDK scientists and outside experts. This publication was reviewed by William E. Whitehead, Ph.D., University of North Carolina Center for Functional GI and Motility Disorders.

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

This publication may contain information about medications. 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.



U.S. DEPARTMENT OF HEALTH
AND HUMAN SERVICES
National Institutes of Health

NIH Publication No. 12-693
July 2012