



JOHNS HOPKINS
MEDICINE

HEALTH TIPS

TAKING GOOD CARE OF YOUR GUT

What you need to know

A wide array of disorders can affect your digestive tract—the long tube of organs that begins at your mouth and ends at your anus. Many of these disorders—from constipation and heartburn to polyps and cancer—occur more frequently with age. Fortunately, there are steps you can take to maintain the health of your gut. These steps include eating enough fiber, using proper hygiene while preparing foods, knowing when digestive symptoms are serious enough to warrant a call to your doctor, and undergoing regular screening tests. These and other important steps are explained in more detail below.

Making Friends With Fiber

An easy way to prevent and treat a myriad of digestive complaints

For years, health professionals have encouraged people to increase the amount of fiber in their diet to improve the health of their digestive system. And even though recent studies indicate that dietary fiber does not prevent colon cancer, fiber is still beneficial for the prevention and treatment of other digestive conditions such as constipation, irritable bowel syndrome (IBS), and diverticulosis.

What Is Fiber?

Dietary fiber is a type of carbohydrate that is not digested by the body. Food contains two types of fiber: soluble and insoluble. Soluble fiber mostly helps lower blood glucose and cholesterol levels, while insoluble fiber plays an important role in the function of the digestive tract. The American Dietetic Association recommends that people age 50 and over consume 20–30 g of fiber (soluble and insoluble combined) per day; younger people should get 25–35 g. The average American eats only about 17 g of fiber daily, however.

Fiber and Constipation

Constipation results when fecal matter moves too slowly through the colon. This allows the absorption of too much water from the stool, leaving it dry and hard. One of the first treatments doctors recommend for constipation is an increase in dietary fiber intake, which

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adds bulk to the stool, distending the colon, stimulating peristalsis, and speeding the passage of stool through the colon.

Fiber and Irritable Bowel Syndrome

In people with IBS, adding fiber to the diet may improve constipation and other symptoms such as abdominal pain. In some people, fiber may even help relieve diarrhea. A recent study found that both partially hydrolyzed guar gum (a soluble fiber) and wheat bran (an insoluble fiber) improved bowel habits and abdominal pain in people with IBS; guar gum provided somewhat better results.

Fiber and Diverticulosis

Because the contents of the colon lack bulk in people on a low-fiber diet, stronger muscle contractions are needed to push fecal matter through the colon. This increased pressure puts strain on weak areas in the colon wall, which can lead to bulges called diverticula. This condition known as diverticulosis increases the risk of diverticulitis (an infection of the diverticula) and bleeding from diverticula due to rupture of a blood vessel.

The standard treatment for diverticulosis is a high-fiber diet. Fiber prevents more diverticula from forming, decreases the pressure required to push waste through the colon, and lowers the risk of developing diverticulitis. However, fiber will not eliminate existing diverticula. One study of 44,000 male health professionals found that those with the highest intakes of fiber, particularly insoluble fiber, had about a 40% reduced risk of diverticular disease.

The Best Sources of Fiber

Some good sources of soluble fiber are fruits, vegetables, beans, and oat bran. Good sources of insoluble fiber include whole-grain foods, wheat bran, and seeds. The total fiber content of some common high-fiber foods is listed in the box on page 3. You can use this list, along with reading food labels, to determine how much fiber you typically eat.

If you discover that your fiber intake is low—less than 20 g per day—try adding some high-fiber foods to your diet. Add fruits like bananas, raisins, and berries to whole-grain breakfast cereals. When possible, don't peel fruits and vegetables—the skin contains a large amount of fiber. Eat vegetables raw, when appropriate. And when you cook vegetables, steam them lightly or microwave them only briefly to prevent the breakdown of fiber.

If you cannot obtain enough fiber from your diet alone, you may want to consider taking an over-the-counter fiber supplement, such



as Citrucel, Fiberall, Konsyl, or Metamucil. These products are generally safe to use on an ongoing basis. Consult the product label, your doctor, a dietitian, or a pharmacist about how much to take and how often.

Some Precautions

Although fiber can be beneficial to your health, it can cause bloating and gas when eaten in larger amounts than your body is accustomed to and can cause constipation if inadequate amounts of fluids are consumed. To minimize these side effects, increase your fiber intake gradually and drink about eight glasses of fluid a day when consuming a high-fiber diet.

What's the Fiber Content?	
Food	Amount of Fiber (g)
½ cup cooked peas	8
½ cup cooked lentils	8
1 cup raisin bran	7.5
2 biscuits of shredded wheat	5
2 dried figs	4
¾ cup wheat bran flakes	4.5
½ cup canned kidney beans	4.5
1 pear	4
1 large apple with skin	3.5
1 orange	3
1 banana	3

How To Avoid a Foodborne Illness

Guidelines for choosing, storing, preparing, cooking, and serving food

Foodborne illnesses cause 76 million infections, 300,000 hospitalizations, and 5,000 or more deaths each year in the United States. Sounds scary, doesn't it? Fortunately, there are numerous measures you can take to prevent getting sick from the food you eat.



The most common foodborne illnesses are infections caused by microscopic bugs that thrive in or on food that has been handled improperly.

The Culprits

The most common foodborne illnesses are infections caused by microscopic bugs that thrive in or on food that has been handled improperly. Unwashed, raw, or undercooked foods are the most vulnerable to this type of contamination. In the United States, the usual contaminants are bacteria (species of *Shigella*, *Salmonella*, and *Staphylococcus*; *Campylobacter jejuni*; *Bacillus cereus*; and certain strains of *Escherichia coli*) and viruses (most commonly the Norwalk viruses).

Many people assume that all foodborne illnesses are “food poisoning,” but food poisoning is only one type of foodborne illness. True food poisoning is caused by a toxin or a chemical in the foods you eat. For example, food poisoning can result from deadly toxins produced by poisonous mushrooms or by the bacterium *Clostridium botulinum* (which results in botulism).

Food-related illnesses can also be caused by parasites. Overall, they are more likely encountered abroad in areas where food-handling practices are less stringent than in the United States.

The Importance of Prevention

Proper food-handling practices and personal hygiene are key to preventing foodborne illnesses. Here are some prevention tips you should follow when choosing, storing, preparing, cooking, and serving food.

Choosing Food

- When buying perishable foods, avoid packages that are ripped or leaky.
- Put perishable items in your grocery cart last.
- Avoid items that have passed their expiration date.
- Pass up cans that are bulging or dented.
- Do not purchase pre-stuffed, fresh, whole poultry.
- Buy only pasteurized milk and juice.
- Check fresh food for mold.

Storing Food

- Refrigerate food at 40° F or below; freeze food at 0° F or below.
- Refrigerate oils containing garlic or herbs.
- Store raw meat, poultry, and seafood away from other foods to prevent bacteria from spreading; seal these foods in containers or bags to prevent raw juices from dripping onto other foods.
- Avoid overstuffing the refrigerator, so that air can circulate.
- Save cooked leftovers for no more than four days.



- Freeze or cook fresh poultry, seafood, and ground meat within two days of purchase. Freeze or cook whole cuts of meat within three to five days.

Preparing Food

- Wash hands thoroughly with soap and water for 20 seconds before and after handling food.
- Thaw frozen foods in the refrigerator (never at room temperature); cook them immediately. For faster thawing, use the microwave or submerge foods in cold water in a sealed container.
- Always refrigerate food that is being marinated.
- Avoid cross-contamination: Use one cutting board and set of utensils to prepare any raw meat, fish, poultry, or eggs for a meal. Use a separate cutting board and utensils for all other ingredients (such as vegetables or bread).
- Use strict sanitary procedures when home canning. Boil home-canned food before eating, if possible, to destroy any microbes.
- Clean fruits and vegetables thoroughly with water before eating.
- Sanitize cutting boards and countertops with a solution of one teaspoon of chlorine bleach in one quart of water.

Cooking Food

- Thoroughly cook meat, poultry, seafood, and eggs. Use a meat thermometer to ensure proper internal cooking temperatures of meat, poultry, and casseroles. Insert the thermometer into the thickest part of the food, as far as possible from bone, fat, or gristle.
- Cook sprouts thoroughly. Do not serve raw or lightly cooked sprouts.
- Reheat foods to an internal temperature of 165° F.
- Cook steaks, roasts, and chops of beef, veal, and lamb to an internal temperature of 145° F; all cuts of pork to 160° F.
- Cook whole poultry, as well as poultry thighs and wings, to an internal temperature of 180° F; breasts to 170° F.
- Cook ground meat to an internal temperature of 160° F; ground poultry to 165° F.

Serving Food

- Hold hot foods at 140° F or higher and cold foods at 40° F or lower.
- Use warming trays and chafing dishes to serve hot foods at a buffet. Hold cold foods on ice.
- Serve food on clean plates that have not touched raw meat, fish, poultry, or eggs.

Use a meat thermometer to make sure that proper internal cooking temperatures of meat, poultry, and casseroles have been achieved.



The symptoms of food-related infections include nausea, vomiting, and diarrhea, sometimes with fever. They typically develop within 12–72 hours of eating tainted food.

- Refrigerate foods promptly after serving. Discard perishables left at room temperature for two hours or more; one hour if the room or outdoor temperature is 90° F or above.
- Never give honey to a baby because of the potential for botulism poisoning.

When a Foodborne Illness Strikes

Recognizing the symptoms of a foodborne illness and knowing when to see a doctor or engage in self-care measures can minimize risk and ensure a safe recovery.

The Symptoms

The symptoms of food-related infections are similar regardless of the cause. Symptoms typically include some combination of nausea, vomiting, and diarrhea, sometimes with fever. Symptoms generally develop within 12–72 hours of eating tainted food. Most cases are mild and get better on their own. However, severe infections can cause high fever and significant dehydration.

Who's Most At Risk?

Failing to recognize symptoms and to treat food-related illness can have serious, even deadly consequences, particularly for young children and the elderly. Other high-risk people include those with a compromised immune system (for example, those taking anti-rejection drugs after an organ transplant), those who have a chronic health problem such as coronary heart disease or diabetes, and people undergoing certain treatments such as long-term corticosteroid therapy, radiation therapy, or chemotherapy.

When To Call a Doctor

High-risk people should see a doctor as soon as a food-related infection is suspected. Healthy people should see their physician if they have bloody diarrhea, weight loss, a fever of 101° F or higher, severe abdominal pain, neurological symptoms (for example, motor weakness, numbness, or tingling), or prolonged diarrhea. Treatment includes bed rest and fluids, and possibly oral antibiotics. Very high-risk people and those with severe infections may require hospitalization.

Self-Treatment

Healthy people with mild to moderate symptoms can usually treat themselves with bed rest and fluids. Over-the-counter antidiarrhea medications, such as loperamide (Imodium A-D) and bismuth



(Bismatrol, Pepto-Bismol), may relieve cramps and minimize diarrhea. However, Imodium A-D may worsen the effects of some bacterial infections (including Salmonella, Shigella, and Campylobacter jejuni) and should not be used without consulting a doctor if a food-related infection is suspected. In any case, neither medication should be taken for more than 48 hours.

To help prevent a mass outbreak of foodborne illness, notify the local health department if the contaminated food was served at a large gathering, a restaurant, or other facility, or if the food was purchased at a commercial establishment.

Maybe It's Not "Just Heartburn"

When to call your doctor—or even an ambulance

Nearly everyone has had a bout of heartburn—a burning sensation in the chest caused by the backflow of stomach contents into the esophagus. Occasional heartburn is usually nothing to worry about and can be easily treated with over-the-counter medications such as antacids. But sometimes heartburn can be a sign of something more serious, such as gastroesophageal reflux disease (GERD) or an esophageal ulcer, stricture, or even cancer.

To know when to take heartburn seriously, check the list below. If you experience any of these symptoms, call your doctor.

- Heartburn occurs several times a week or wakens you at night.
- Heartburn persists after taking over-the-counter or prescription medication.
- You are having difficulty swallowing.
- You are vomiting, especially blood or black material.
- Your stools are black.
- You've lost weight without trying.
- You've lost your voice.
- You are experiencing severe hoarseness or wheezing.

Heartburn-like chest pains could be a sign of a heart attack. If any of the symptoms listed below arise, call 911 immediately.

- A feeling of pain, squeezing, fullness, or pressure in the center of the chest that lasts longer than a few minutes.
- Pain radiating into the shoulder, arm, or jaw, particularly on the left side of the body.

Heartburn-like chest pain could be a sign of a heart attack.



- Chest pain accompanied by shortness of breath, a cold sweat, nausea, fainting, dizziness, paleness, or lightheadedness.
- Palpitations or an increase in heart rate.
- Fatigue, weakness, or anxiety of no known cause.

Should You Try Probiotics?

Friendly bacteria for your gut

We wash our hands, brush our teeth, and scrub our countertops to get rid of germs, so the idea of deliberately swallowing hundreds of millions of live bacteria may seem counterintuitive—even revolting. But evidence is accumulating that “friendly” bacteria called probiotics can safely treat a variety of digestive disorders.

So far, the best evidence for probiotics (from the Latin and Greek, meaning “for life”) exists for treating infectious diarrhea in children, antibiotic-associated diarrhea, and pouchitis, a condition that often affects people with ulcerative colitis who have undergone surgery of the colon.

Probiotics are also promising for irritable bowel syndrome (IBS), ulcerative colitis, and Crohn’s disease and for prevention of bacterial infections after surgery.

Your Natural Intestinal Flora

Your digestive tract plays host to hundreds of types of bacteria and other microorganisms, which are termed flora. Although some of these organisms can cause disease, most perform valuable functions. For instance, beneficial bacteria in the digestive tract produce substances, such as lactic acid and hydrogen peroxide, which inhibit the growth of harmful bacteria and fungi. These bacteria also compete with disease-causing microbes for nutrients and space, thus hindering overgrowth of the bad bugs. Beneficial organisms also secrete enzymes that aid digestion.

Encouraging Results

The best-studied probiotics are *Lactobacillus* and *Bifidobacterium*, which are termed lactic acid bacteria because they use sugar as a food source and generate lactic acid in return. These same microbes are used to convert milk into cheese and yogurt. Other beneficial bacteria include the yeast *Saccharomyces boulardii* and a harmless form of the common intestinal bacterium *Escherichia coli*.

Probiotics are being tested for uses ranging from enhancing

Evidence is mounting that “friendly” bacteria called probiotics can safely treat a variety of digestive disorders.



Because probiotics do not permanently colonize the digestive tract, they would probably need to be taken indefinitely to maintain any beneficial effects.

immunity to protecting against cavities, but gastrointestinal problems are likely to be the first disorders treated with probiotics.

Infectious Diarrhea

Some of the most compelling evidence for the effectiveness of probiotics comes from studies of children with severe diarrhea. Several trials have shown that probiotic therapy can significantly reduce the duration of rotavirus infection, the most common cause of diarrhea in infants and children. And a large multicenter European trial showed that adding the probiotic *Lactobacillus GG* to an oral rehydration solution shortened the duration of severe diarrhea in children.

Antibiotic-Associated Diarrhea

There is also good evidence that taking a probiotic during antibiotic therapy can help prevent antibiotic-associated diarrhea. A recent review article concluded that *Saccharomyces boulardii* is an effective treatment; some evidence also exists for *Lactobacillus GG*.

Pouchitis

Several small, placebo-controlled studies show the probiotic VSL#3 is effective in reducing the risk of pouchitis. VSL#3 is a combination of eight probiotics, including several strains of *Lactobacillus* and *Bifidobacterium*.

Irritable Bowel Syndrome

A randomized, placebo-controlled trial by Mayo Clinic researchers determined that eight weeks of therapy with VSL#3 significantly reduced abdominal bloating in people with diarrhea-predominant IBS. In a study of 44 people with IBS, the probiotics *Lactobacillus acidophilus* and *Bifidobacterium infantis* were as effective in improving symptoms and quality of life on their own as when combined with antibiotics.

Ulcerative Colitis and Crohn's Disease

Two controlled trials have found that the probiotic *E. coli* was just as effective as mesalamine (Asacol, Pentasa, Rowasa), a standard drug used to treat ulcerative colitis. The role of probiotics in managing Crohn's disease is still unclear, but trials are under way.

Prevention of Bacterial Infections After Surgery

In a recent trial of 95 people undergoing liver, stomach, or pancreas surgery, those randomized to receive live *Lactobacillus plantarum* were



less likely to develop bacterial infections than those who did not receive it or who received heat-killed *Lactobacillus plantarum*.

Any Drawbacks?

Because probiotics do not permanently colonize the digestive tract, they would probably need to be taken indefinitely to maintain any beneficial effects. Although there is a small chance that they could cause an infection—especially in people at high risk for opportunistic infections or in those whose gastrointestinal tract is badly damaged—the probiotic strains that have been tested appear to be very safe. Other problems include difficulties in determining the dose and the need to standardize different types of probiotics.

In addition, more research is needed to identify the best probiotic—and the optimal dose—for managing a particular condition. Moreover, many experts believe that better regulation of probiotics is needed to ensure that over-the-counter products now widely available contain viable microorganisms in the amounts stated on the label. A recent Canadian study of 10 commercial probiotic formulas found that two contained no viable organisms, and the remaining eight contained only 10% of the number stated on the label.

Giving Probiotics a Try

If you want to try a probiotic supplement for a few weeks to see if it will help your gastrointestinal symptoms, check with your doctor first. A variety of capsules, liquids, and powders are available. Powders can be stirred into food but shouldn't be added to food warmer than room temperature because heat will kill the bacteria.

Another option is to add probiotic-containing foods to your diet. These foods include yogurt, kefir (a cultured-milk beverage), tempeh (which is made from soybeans), and kimchi (a Korean fermented cabbage dish). It is unclear, however, whether they contain enough probiotics to have any effect.

New Ways To Look Inside

The benefits and drawbacks of the newest diagnostic exams

By combining state-of-the-art imaging and computer techniques, researchers have developed two new ways for doctors to view the small and large intestines. In the first, a technique called capsule endoscopy,



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a swallowed video pill takes images of the entire 20 feet of the small intestine. In the second, called a virtual colonoscopy, doctors view the large intestine (colon) noninvasively—that is, without having to insert a viewing tube through the rectum and up into the colon.

At first glance these new techniques appear to be improvements over conventional endoscopy and colonoscopy, but they both have drawbacks that limit their widespread use. As a result, they are appropriate only for a small number of people.

Capsule Endoscopy

Capsule endoscopy was approved by the U.S. Food and Drug Administration in 2001. The capsule is somewhat larger than a vitamin pill (0.4 x 1 inch) and contains a video camera, light, battery, and radio transmitter. The capsule is swallowed and takes pictures of the small intestine as it passes through the digestive tract. The images are sent to an antenna and recording device about the size of a Walkman, which is worn at the waist.

What's Involved?

Preparation for capsule endoscopy typically involves taking laxatives the night before the procedure to empty your bowels, followed by an overnight fast. On the day of the procedure, you will swallow the capsule with a glass of water. Peristalsis, the rhythmic muscle contractions that normally move food through the intestines, will propel the capsule through your digestive tract.

The capsule takes pictures of your digestive tract at a rate of two per second. You can continue your normal activities and begin to drink clear liquids two hours after swallowing the pill. You can eat a light meal after four hours. You may be asked to keep a diary of what you eat and drink and any symptoms you experience. The battery in the capsule wears out after about eight hours, and you will be asked to go back to your doctor around this time to return the recording device. The images are then downloaded and analyzed on a computer.

Your body cannot digest the capsule, and it will pass intact through your digestive system and into your stool, usually within 24 hours. You do not need to return the capsule to your doctor, but you should let your doctor know that it has passed out of your body.

Most people experience no pain or discomfort from the procedure.

Who Should Have It?

A capsule endoscopy is not appropriate for everyone. But for those with symptoms that cannot be explained by the results of standard diagnostic techniques, capsule endoscopy can be a useful option



and may reduce the need for exploratory surgery. Thus, capsule endoscopy should be performed only after an endoscopy is unable to provide an adequate explanation for your symptoms; it is not a substitute for conventional endoscopy.

Capsule endoscopy is not appropriate for people with an implanted electrical device (such as a pacemaker), since the capsule may interfere with the device's electrical functioning.

The Benefits

Capsule endoscopy provides a complete view of the small intestine, particularly of areas that cannot be reached using endoscopy or colonoscopy. The procedure can shed light on bleeding, chronic abdominal pain or diarrhea, or malabsorption that is originating from the small intestine. The procedure can also pinpoint tumors and diagnose conditions like celiac disease or Crohn's disease. In a recent study of 35 patients with unexplained gastrointestinal bleeding suspected to originate in the small intestine, a diagnosis was made through capsule endoscopy in 63% of the cases.

The Drawbacks

There are several limitations to capsule endoscopy. First, the capsule moves too fast to produce good images of the esophagus. Two, the stomach and large intestine are too big to view with the capsule. Third, doctors are unable to perform biopsies or stop bleeding as they can with conventional endoscopy.

Another potential drawback: The capsule gets stuck in the intestines of about 1 in 200 patients. To prevent this complication, you may need to undergo a barium swallow before capsule endoscopy to look for any narrowings or obstructions in the intestines. The risk of having the capsule become stuck is greater in people who have undergone gastrointestinal surgery or have a history of gastrointestinal obstruction.

Virtual Colonoscopy

First introduced in 1994, virtual colonoscopy has piqued the interest of lay people and doctors alike as a way to inspect the colon non-invasively. Because only 40% of people at risk for colon cancer undergo regular screening for the disease, some experts have proposed that a noninvasive screening test, such as a virtual colonoscopy, might be more acceptable to people and result in more people undergoing screening.

What's Involved?

A virtual colonoscopy can be just as uncomfortable as a standard colonoscopy. It involves emptying your bowels the evening before, just like in a standard colonoscopy, and most people find this to be the worst part of a colonoscopy.



The technique involves computed tomography scanning or magnetic resonance imaging of the abdomen to produce two- and three-dimensional images of the inside of the colon.

The Many Drawbacks

Unfortunately, a virtual colonoscopy is not a good option for most people. First, a standard colonoscopy is still needed for confirmation of the diagnosis and to perform a biopsy if any abnormalities are detected. In one study, about two thirds of people who underwent virtual colonoscopy needed a subsequent standard colonoscopy because of abnormal findings. Second, polyps cannot be removed during a virtual colonoscopy as they can during a standard one. Third, virtual colonoscopy cannot distinguish stool from polyps and cancer, leading to a large number of false-positive results (the test indicates the presence of polyps or cancer when none really exists).

Fourth, a virtual colonoscopy can be just as uncomfortable as a standard colonoscopy. For example, it involves emptying your bowels the evening before, just like in a standard colonoscopy, and many patients find this to be the worst part of a colonoscopy. In addition, air is pumped into the colon just before a virtual colonoscopy, which can cause cramping. During a standard colonoscopy, patients are usually sedated and do not feel the cramping.

Fifth, a virtual colonoscopy doesn't visualize the colon as well as a standard colonoscopy. One study found that a virtual colonoscopy missed about 10% of the polyps found during standard colonoscopy and indicated trouble in 28% of cases when the standard colonoscopy was normal. While virtual colonoscopy can detect large growths almost as well as standard colonoscopy, it is not as good at detecting small polyps.

Who Should Have It?

No medical organization recommends virtual colonoscopy as a screening method for colorectal cancer. However, the procedure may be appropriate for people who have medical conditions that make a standard colonoscopy risky or physically difficult.

The Bottom Line

Although a capsule endoscopy doesn't replace standard diagnostic procedures, it has proven useful in cases where symptoms could not otherwise be explained. In addition, health insurance companies are beginning to pay for the procedure, which costs about \$1,500. Insurance companies will likely not pay for a virtual colonoscopy, and the procedure appears useful for only a small group of patients (those who cannot undergo a standard colonoscopy).

The information contained in this Health Tips is not intended as a substitute for the advice of a physician. Readers who suspect they may have specific medical problems should consult a physician about any suggestions made.

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