



## Diverticulosis and Diverticulitis (Updated 10.08)

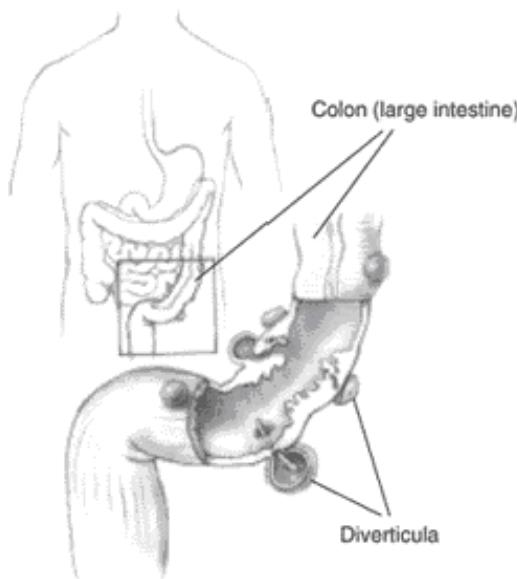
### General Information

The colon, or large intestine, is a muscular tube that forms the last part of the digestive tract. Semi-liquid food waste (stool) from the small intestine enters the colon at the cecum (the beginning of the colon). The stool moves from the cecum to the ascending colon, across the transverse colon, to the descending colon, sigmoid colon, and lastly through the rectum and anus. As the stool travels, the colon absorbs water and solidifies it.

**Diverticula** are pouches that can form in the walls of your colon. A healthy colon is lined with muscles that help move stool through your colon, into your rectum, and out your body. Without enough fiber and water in your digestive system, stool becomes hard and pressure builds up inside your colon. Your colon's muscles have to squeeze more to move harder stools through the colon. That extra pressure can cause the lining of the colon wall to bulge out into diverticula, and the resulting condition is called **diverticulosis**. This usually occurs in the lower left, or *sigmoid*, colon. You may not even know that you have diverticula, but they can cause mild cramping, bloating, and changes in your bowel habits, including constipation, diarrhea, urgency, or rectal bleeding.

Nearly half of Americans over 60 years of age have diverticulosis. Maintaining a healthy lifestyle, including a high-fiber diet, plenty of fluids, and daily exercise, can help you avoid complications from this condition.

**Diverticulitis** occurs when the diverticula become infected or inflamed. The exact cause is unknown, but it may occur when stool lodges in the openings of diverticula, causing the pouches to swell. Swelling or inflammation may make the wall of the pouch thinner, allowing bacteria from the bowel to infect the cells in the lining. Symptoms of diverticulitis include a change in your bowel habits, along with pain in your lower left abdomen, which may be severe or may last for several days. You may develop nausea, fever, and chills. If the infection and inflammation becomes severe, the diverticula may rupture, causing infection of the abdominal cavity (peritonitis).



## **Signs and Symptoms**

Diverticulosis may cause a change in your bowel habits, including constipation, diarrhea, and urgency. Other symptoms include mild cramping, bloating, or rectal bleeding, if the inflammation causes a blood vessel to burst.

Symptoms of diverticulitis and infection include severe pain, fever, and chills.

## **Diagnosing Diverticulosis**

Your doctor will do a complete "history and physical," first asking you numerous questions about your diet and symptoms, and then examining you physically, including a rectal exam. Your stool may be examined for mucus or blood, even if these are not obvious to the naked eye.

Special imaging techniques can be used to view the colon. A barium enema, followed by an x-ray, can show abnormalities such as pouches in the wall or narrowing of the colon. The doctor may also perform a **sigmoidoscopy**, using a tiny, flexible scope inserted through your anus, to see the lower aspect of the colon, or a **colonoscopy** with a longer scope, to view your entire colon. During the procedure the doctor can remove tissue samples, if needed, for detailed examination.

## **Treatment**

If you are diagnosed with diverticulosis, it is important to take action as early as possible to prevent complications and improve the health of your bowels. This might be as easy as changing your diet, exercising, and/or starting medications.

The two main keys to controlling diverticulosis are increasing your liquid and fiber intake. Fiber absorbs water as it travels through your colon, helping your stool stay soft and move smoothly. Try to increase your fiber intake to 25 to 30 grams per day by eating more fruits, vegetables, and whole grains. (See our list of good food sources of fiber, at the end of this discussion.) Over-the-counter stool-bulking agents like Metamucil or bran may also help, but start slowly to prevent discomfort from bloating and gas. Some cases of diverticulosis may require stool softeners or antispasmodic medications for pain relief. Exercise will also help keep your digestive tract flowing and prevent constipation.

If you have a mild case of diverticulitis, it may be treated with a temporary liquid diet and oral antibiotics. Severe cases of infection may need hospitalization and IV (intravenous) and antibiotics. Once your colon has rested and the inflammation has resolved, you'll start increasing the high-fiber foods in your diet. If other types of treatment don't control the problem or if complications occur, surgery will be needed.

## **Colon Resection Surgery**

If other treatments for diverticulitis do not control the inflammation and infection, your surgeon may perform a **colon resection**. During a colon resection, the surgeon removes (resects) the affected piece of colon and then sews the two new ends together (anastomosis). The repair is designed to maintain your colon's normal tube-like shape, so you can regain your normal bowel movements. Colon resection may be done as open surgery, with an incision down your belly, or laparoscopically. Laparoscopic surgery is done by making 4 or 5 small incisions and inserting instruments and a tiny camera to perform the surgery. A gas is used to inflate the belly and lift the abdominal wall away from the internal organs. Your surgeon will determine which option is best for you.

**Colon Resection with Colostomy:** If your colon is too inflamed or diseased and the surgeon cannot rejoin your colon with your rectum, the surgeon will create a colostomy, or a new opening for the colon on the outside of your abdomen for removal of waste. The colon is brought out through the opening and formed into a "stoma." When you have a bowel movement, stool passes out through the stoma and into a colostomy bag or appliance. Often, once the inflammation has healed in a few months, you will undergo another surgery to re-attach your colon to your rectum and remove the colostomy. In some cases, the colostomy may be permanent.

## **Risks and Possible Complications of Surgery (Colon Resection)**

- Infection
- Injury to nearby organs
- A connection (anastomosis) that leaks or separates
- Possible colostomy
- Risks from anesthesia
- Blood clots

# **Colon Resection**

## **What to expect before, during, and after your surgery**

### **Before surgery**

Before your surgery, you may be asked to follow a special diet to help reduce your discomfort, and should drink plenty of water (eight 8-ounce glasses of water daily).

Inform your doctor about any medications you take, including over-the-counter supplements. Some medications must be out of your system before surgery.

### **Preparing for surgery**

- Your colon must be completely cleaned out before the procedure. This is called a "bowel prep." Your doctor may have you do this at home or in the hospital. A number of cleansing methods may be used, including enemas or laxatives and a clear-liquid diet
- Clear liquid diet: for 12 to 24 hours before your surgery, you will be told not to eat any solid foods and to drink only clear liquids. These include broth, plain coffee, gelatin, and clear fruit juice
- Take nothing by mouth ("NPO") after midnight on the night before your surgery. This includes water and chewing gum. Your stomach must be empty. If there are any required medications that your doctor has okayed, including antibiotic pills, take them with a small sip of water
- Arrange for a ride home from the hospital
- Arrange for help at home for the first few days after the surgery
- Prior to the operation, blood tests, an electrocardiogram (EKG), or a chest x-ray might be required

### **During Colon Resection Surgery**

The day of surgery you will come to the hospital and the nurses will get you ready for surgery. They may clean and shave the surgical area, start an IV, and answer any last-minute questions.

You will be put to sleep by the anesthesiologist before the procedure begins.

### **After Surgery**

You will be admitted into the hospital for 4 to 8 days. During your stay, you'll be monitored carefully to make sure you're healing well and that your colon has started working again.

A nasogastric (NG) tube, going through your nose and into your stomach, may be used to keep your stomach empty for a few days. The surgery will cause a

postoperative ileus. This is a temporary paralysis of a portion of the intestines preventing food or drinks from moving forward. For this reason, it is important for you to slowly start your diet to prevent complications. You'll receive the fluids you need intravenously during that time. When you start to pass gas, it is a sign that your colon is working again. The hospital will then start you on a liquid diet. If you are tolerating the liquid diet with no nausea or increased abdominal pain, you will progress to a soft diet, typically in a day or so. You should continue the soft diet for 2 to 8 weeks after surgery, depending on your healing and what your doctor instructs. We will provide a list of foods to help you choose a soft diet when you have returned home.

You should be up and walking within a day or two after surgery. This will encourage your circulation and bowel function to return to normal, and may prevent complications.

Do your breathing exercises to make sure you are inflating your lungs completely. It may be painful for your abdomen at first but it is important to do these exercises to clear any fluid that may be in your lungs from surgery, and prevent pneumonia.

## Caring for Yourself after Surgery

- **Activity/Work:** When you return home, take it easy. Do not do any strenuous activities or heavy lifting of more than 5 to 10 pounds for at least 4 to 6 weeks after surgery. (A gallon of milk weighs just over 8 pounds.) You can begin having sex again when you feel ready, usually 2 to 4 weeks post surgery. You can return to work 1 to 2 weeks after laparoscopic surgery, and 3 to 4 week after an open surgical repair, depending on the type of work and if light duty is acceptable.
- **Shower:** You can shower 24 to 48 hours after surgery, unless otherwise instructed by your doctor. There will be sterile tape (called a "steri-strip") over the incision. Leave the tape on while showering. Do not soak in a bath or hot tub. Sometimes an incision is stapled and you won't have steri-strips. In this case you can shower without a bandage. Be sure to dry the area well afterwards.
- **Driving:** Do not drive while taking pain medications. It is considered driving "under the influence." You will be able to drive when you feel capable of making a quick decision and no longer need narcotic pain medications.
- **Incision care:** Your incision will be dressed with a sterile bandage or "steri-strips." Leave this bandage on until it falls off on its own or until your doctor takes it off in the office. There may be some redness around the edges of the incision. An infection may be starting if the drainage is thick green or yellow, or if the skin around the incision is increasingly red or warm to touch. Call your doctor if these symptoms occur.

- **Fever:** Your temperature can vary after surgery and a low-grade temperature is common. If your temperature exceeds 101.5 degrees or if it is accompanied by chills, vomiting, or flu-like symptoms, you should call the office.
- **Pain:** Pain control is very important after surgery. Be sure to stay ahead of the pain and take your pain medication as prescribed by your doctor. You may add Advil (ibuprofen) to your pain medication if you do not have any allergies or contraindications for taking it. Ask your doctor if you have any questions.  
  
Right shoulder pain is common after laparoscopic surgery. This may be due to the gas used to inflate your abdomen. It will dissipate in a few days.
- **Constipation** is common after surgery. Taking pain medications such as Vicodin or Percocet also cause the bowel to move more slowly. A stool softener, such as Colace, milk of magnesium, or prune juice may help.
- **Diarrhea** is also common after a colon resection. Your colon is shortened and therefore stool may pass at a faster rate. Give it time, approximately 6-8 weeks, and your colon should start to function more normally. When a long piece of colon is removed, however, a faster transit time may be a permanent side effect of the surgery.
- **Nausea** is common after surgery. Be sure to take your pain medication on a full stomach. Stick to a soft, bland diet for the first few weeks after surgery. If necessary, call your doctor for prescription medication to aid with nausea.
- **Diet**
  - You will start a liquid-to-soft diet in the hospital. Continue this diet for the first 2 to 6 weeks after surgery. Refer to our handout on soft diet.
  - Eat foods that are easy to swallow and digest, such as soup, bananas, gelatin, pudding, and yogurt.
  - Eat frequent, small meals.
  - Once you begin eating regular meals, you may feel full faster. This will go away over time.

### **When to call the office**

- Fever over 101.5 degrees.
- Nausea or vomiting.
- Persistent, increasing pain.
- Bleeding.
- Increased redness or drainage from an incision.
- Change in skin color/jaundice.
- Pain or swelling in your calf.
- Cough or shortness of breath.

### ***When to go to the Emergency Room***

- Uncontrolled bleeding from an incision.
- Persistent vomiting.
- Change in mental status.
- Severe shortening of breath, chest pain.

You are always welcome to call the office with your questions or concerns. After hours, an answering service will direct your questions to the on-call providers. However, these individuals are unable to call in prescriptions for pain medication after 5 p.m.

### **Staying Healthy after Surgery**

In 4 to 8 weeks you will be recovered from surgery and back on a regular diet, but it is important to keep your colon healthy. This includes eating plenty of high-fiber fruits, vegetables, and whole grains throughout the day. Also, drink plenty of liquids such as water and juice. Some patients find that avoiding seeds and nuts that might get stuck in a diverticula helps prevent a flare up and pain.

**Eat enough fiber:** You need 25 to 30 grams of fiber each day. Try choosing fiber-rich foods throughout the day and add pure (unprocessed) bran to your food or drinks. You can also use a stool-bulking agent such as psyllium (like Metamucil) or methylcellulose (Citrucel).

**Drink enough liquids:** Liquids help your body digest food and move it through your system in a timely manner. Most people should drink at least 8 glasses of liquid each day. Avoid coffee and sodas because they may cause spasms and pressure in your colon. To increase your liquid intake try the following:

- Bring a bottle or a jug of water with you to work and pour yourself a cup every hour
- Drink plenty of liquids with and between meals
- Take water with you when you exercise to replenish the liquid your body loses

## **Staying Healthy after Surgery continued**

### **Good Food Sources for Fiber**

<b>Food</b>	<b>Amount of fiber</b>
1 medium apple	4 grams
1 medium pear	4 grams
1 medium orange	3 grams
1 cup strawberries	3 grams
5 dried prunes	3 grams
1 baked potato with skin	5 grams
½ cup cooked peas	4 grams
½ cup fresh spinach	2 grams
½ cup cooked green beans	2 grams
½ cup cooked lentils	8 grams
½ cup cooked kidney beans	6 grams
½ cup all-bran cereal	10 grams
½ cup wheat flakes	3 grams
½ cup shredded wheat	3 grams
2 slices whole wheat bread	4 grams
2 slices rye bread	4 grams
½ cup cooked brown rice	2 grams