

# Laparoscopic Surgery of the Colon and Rectum (Large Intestine)

A Simple Guide to Help Answer Your  
Questions



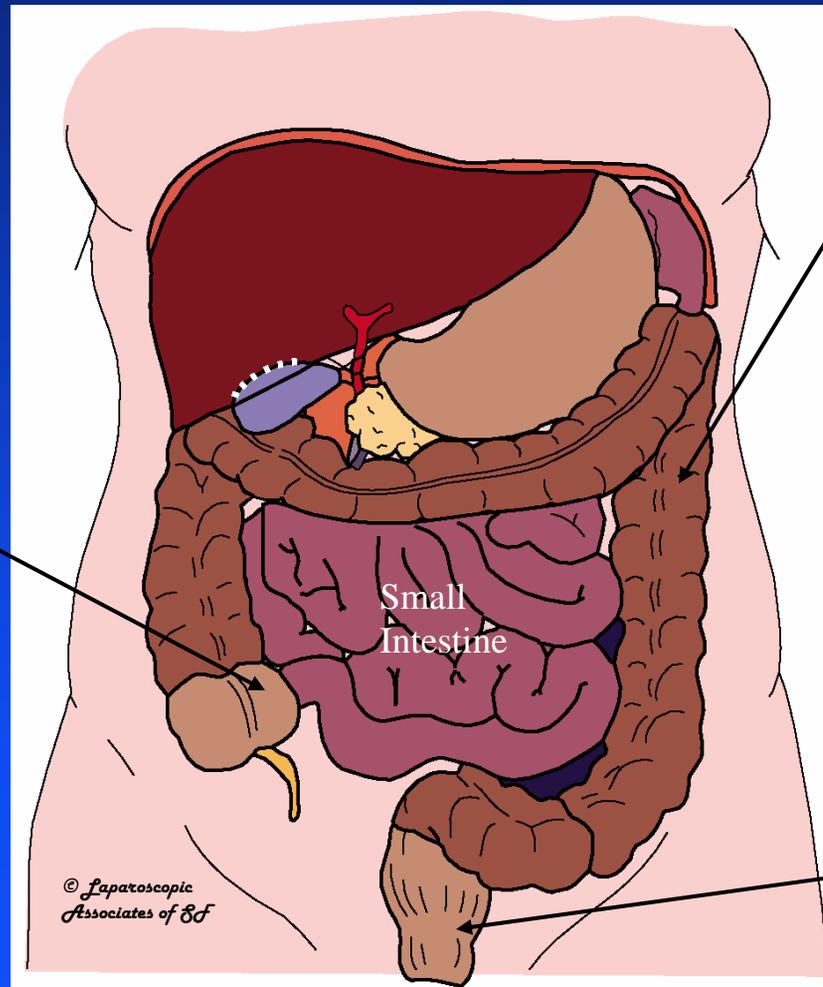
# What are the Colon and Rectum?

- ◆ **The colon and rectum together make up the large intestine.**
- ◆ **After all of the nutritional components (vitamins, minerals and protein) of the food which you have eaten have been absorbed by the small intestine, the remaining material (waste) is emptied into the large intestine.**
- ◆ **The main function of the colon is to absorb water from the stool (fecal material) as it passes through to the rectum**
- ◆ **The rectum is the last 8-10 inches of the large intestine. The rectum serves as a storage tank for stool (fecal material) until it is ready to be expelled from the body (bowel movement).**



# Anatomy

Right side of the Colon where the small intestine empties into the large intestine



Colon or Large Intestine (shaded brown)

Rectum (shaded tan)

© Laparoscopic Associates of SF



# Diseases which affect the Colon and Rectum

**Diseases or problems affecting the large intestine are treated in one of two ways – 1) medically using pills, intravenous medications and/or possibly hospitalization and, 2) surgically with an operation.**

**Colorectal Surgery (surgery of the large intestine and rectum) is quite common and performed both by General Surgeons (gastrointestinal surgeons) as well as Colorectal Surgeons**



# Diseases which affect the Large Intestine

**These problems or diseases can either be malignant (cancerous) or benign (non-cancerous). Both malignant and benign diseases of the large intestine can be treated with surgery.**

**For many problems of the large intestine, surgery is the only hope for a cure or to completely resolve/relieve symptoms.**



# Surgery of the Colon and Rectum

Surgery on the large intestine can be performed in two ways –

**OPEN** (a single, large conventional incision)

**LAPAROSCOPIC** ( several very small incisions)



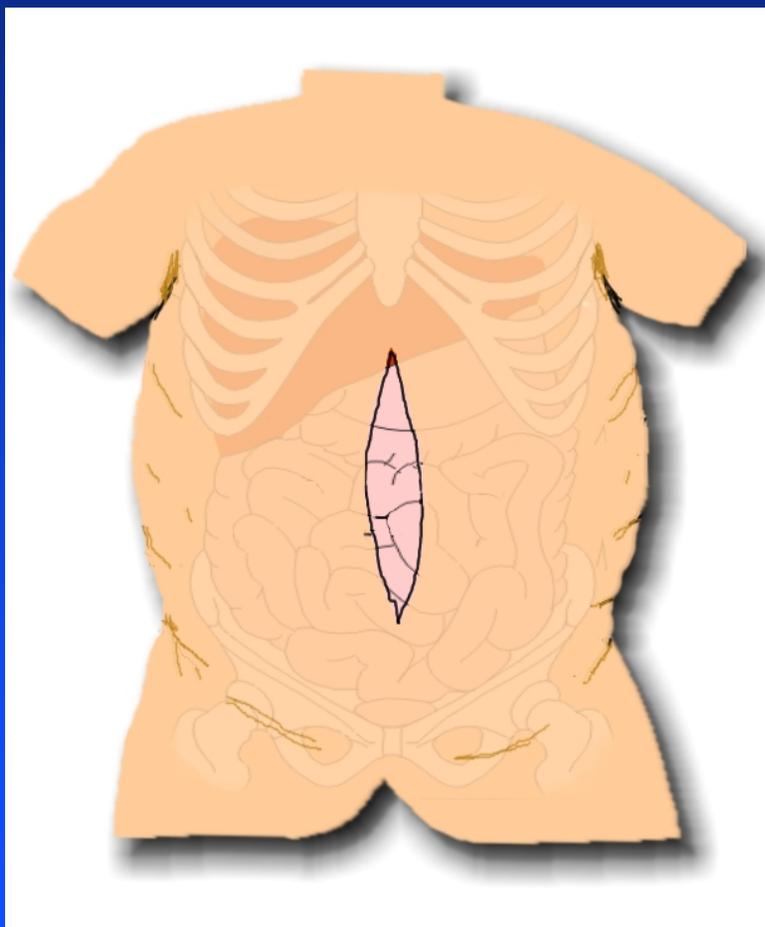
# Colon and Rectal Surgery

## Conventional or Open Colon or Rectal Surgery

- ◆ More than 600,000 operations are performed each year in the US to remove a portion of the colon or the rectum for a variety of diseases.
- ◆ Most conventional (open) operations require a long incision (6-15 inches) up and down the center of the abdomen (belly), similar to a zipper.
- ◆ The average hospital stay is 5-8 days, the time necessary for bowel activity and function to return and for intravenous pain medication to be switched to tablets.



# Conventional (Open) Colon and Rectal Surgery



In open (conventional) surgery, a large incision is made in the middle of the abdomen (belly) to allow the surgeon good visualization and access to the colon and rectum. The incision must be large enough for the doctor to be able to get his hands into the abdomen.



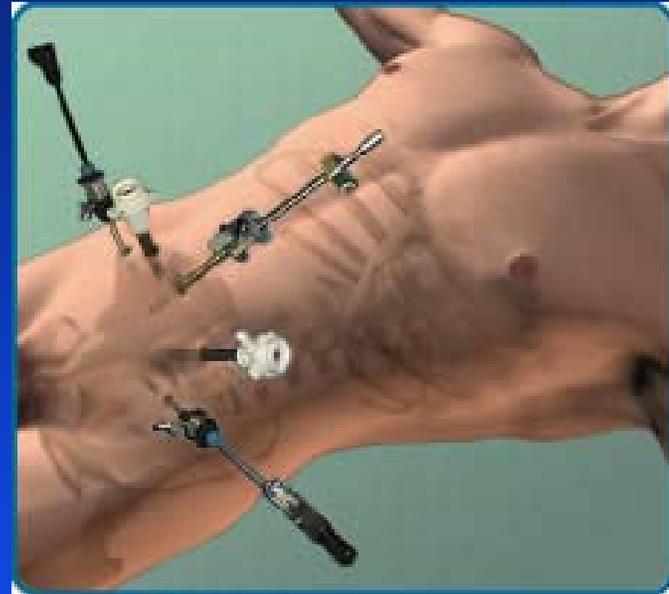
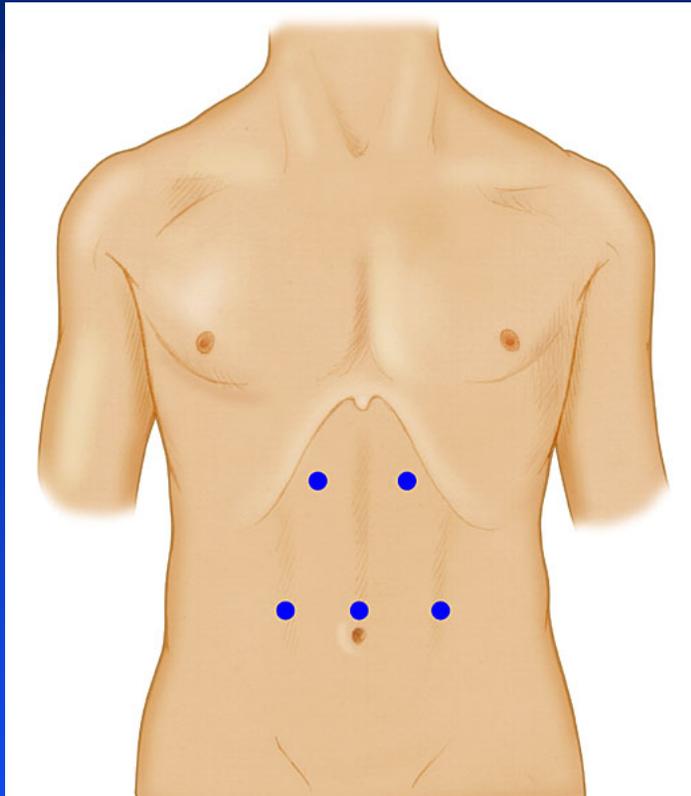
# Laparoscopic Colon and Rectal Surgery

## Laparoscopic Colon and Rectal Surgery

- ◆ Laparoscopic surgery, also called minimally invasive surgery, allows many common operations on the colon and rectum to be performed through small incisions (usually less than one inch in length).
- ◆ Although the exact same operation is performed on the inside of the abdomen as in an open surgery, with a laparoscopic procedure, the recovery is often faster, and patients may leave the hospital more quickly (often in 2-4 days).



# Laparoscopic Surgery



Small (less than 1 inch) are made in several locations. Through these incisions, ports are placed to allow instruments and a camera to be placed into the abdomen. The surgery is performed by the doctor while he watches what is being done on a TV screen



# Benign (non-cancerous) problems which may require surgery

- **Adenomatous Polyps** – these are growths which arise from the mucosa (lining) on the inside of the colon (the lumen) and can cause the following problems:

**Bleeding**

**Obstruction (blockage) of the bowel**

**Progression to cancer if not removed**

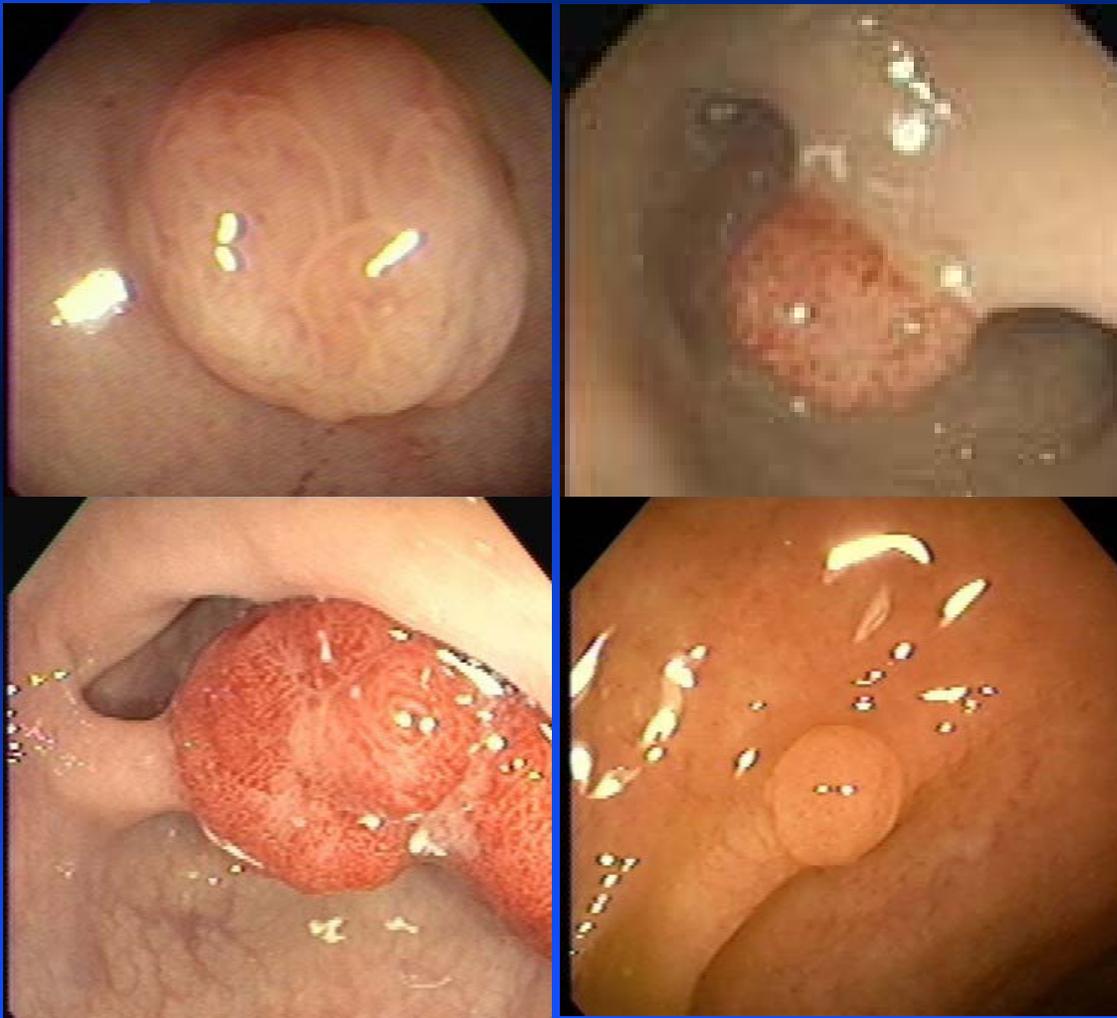


# Adenomatous Polyps

Polyps are usually removed using flexible endoscopy (colonoscopy – see our presentation at [www.colonoscopy.info](http://www.colonoscopy.info)), however if they become extremely large or have cells which are suspicious for cancer, they may need to be removed with an operation



# Adenomatous Polyps



Polyps may range in size from very small (less than 1/5<sup>th</sup> of an inch) to extremely large (2-4 inches)



# Laparoscopic Colon and Rectal Surgery

## Laparoscopic Resection of Colorectal Polyps

- ◆ If an operation is needed to remove a large polyp, generally the segment or portion of the colon where the polyp is located is removed
- ◆ If your polyp is at high risk of already containing a cancer, a laparoscopic approach may not be appropriate. Discuss this with your surgeon (see Colon and Rectal Cancer).



## Benign (non-cancerous) problems which may require surgery

- **Diverticular Disease** – an out pouching (sac) in the wall of the colon which can develop a number of problems or complicating factors (bleeding, infection, abscess, obstruction/blockage of the intestine, and perforation). Diverticular disease becomes more common as one gets older and seems to be caused by a diet high in fats and low in fiber and roughage.

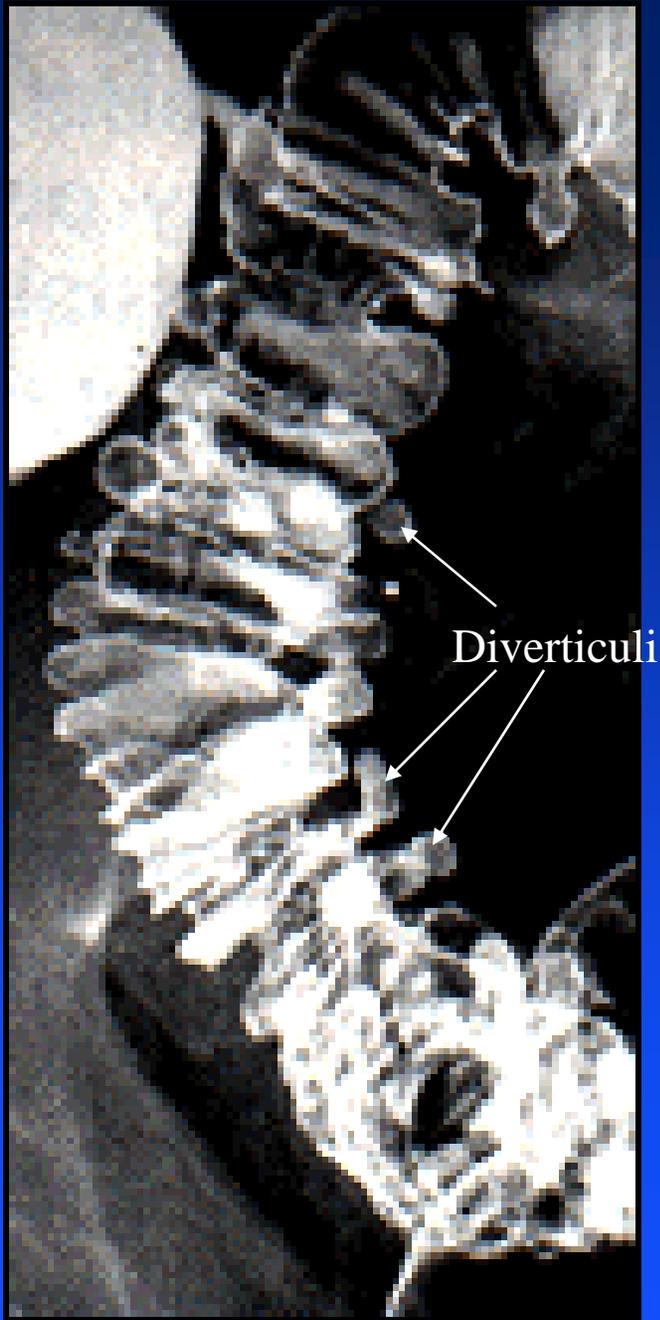


# Diverticular Disease

**By age 70, about 70 percent of all people have some form of diverticular disease. The best defense against developing this problem is a diet high in fiber, as well as regular exercise, avoiding constipation, and drinking at least 8 glasses of water each day.**

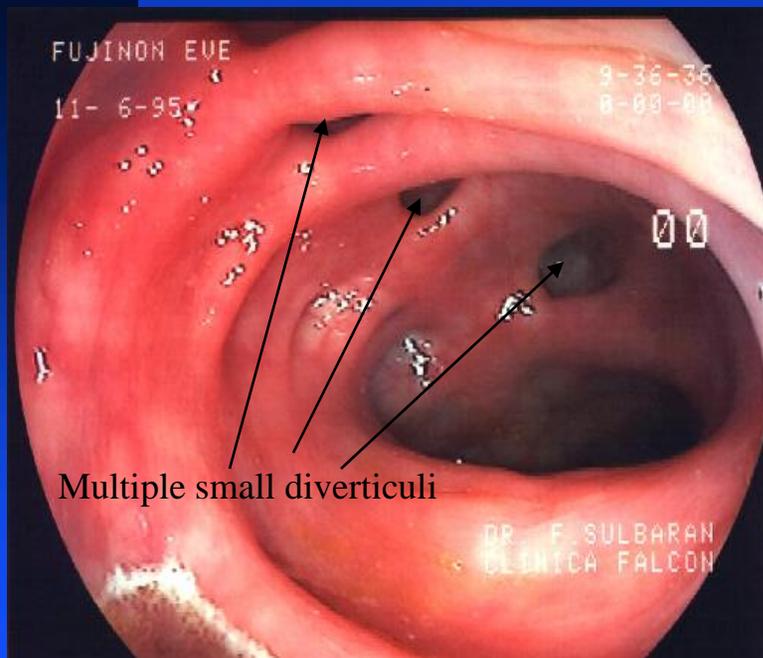
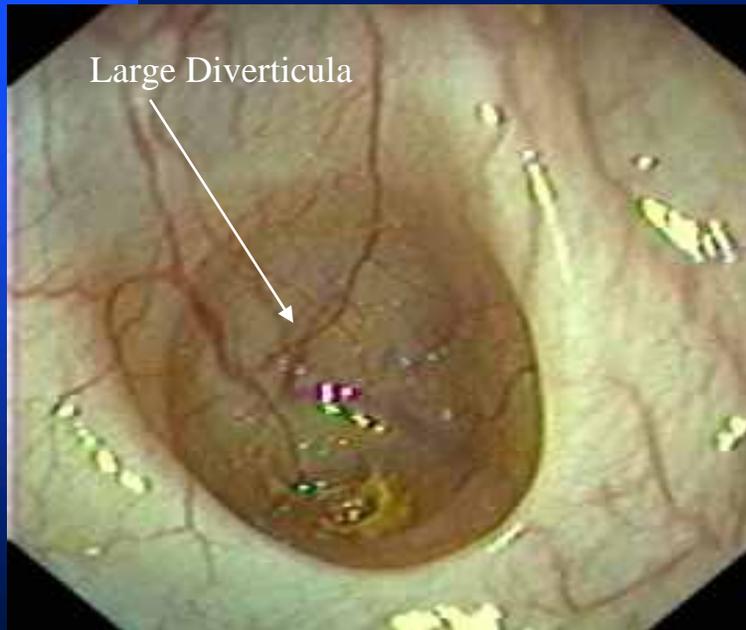
**Most people who have diverticular disease have no symptoms, however if complications of diverticular disease occur, symptoms can develop.**





A barium enema (such as the one shown on the left side of the slide) can demonstrate very nicely the diverticuli which can develop in the colon. These most often develop in the left side of the colon (known as the sigmoid colon).





This is a view of the diverticuli from the inside of the colon (during a colonoscopy). As long as no problems with the diverticuli develop, treatment of this problem is not necessary. Patients who have diverticular disease are encouraged to eat a diet rich in fiber, exercise regularly, and drink plenty of fluids.



# Benign (non-cancerous) problems which may require surgery



■ **Diverticulitis** - If one of the diverticuli becomes blocked with fecal material, an infection can ensue. This generally causes symptoms of fever, abdominal pain, and diarrhea. It may be necessary to treat severe or recurrent cases of diverticulitis with surgery. Generally, the affected portion of the large intestine is removed



# Laparoscopic Colon and Rectal Surgery

## Laparoscopic resection for diverticulitis

- ◆ Operation is almost always recommended after 2 attacks that result in hospitalization, or after one attack in very severe cases.
- ◆ A laparoscopic approach may be possible after the inflammation has settled, but is rarely indicated for an emergency operation.



# Benign (non-cancerous) problems which may require surgery

- **Familial or Hereditary Polyposis** - a genetic disorder which causes many polyps (thousands) to form in the colon. Virtually everyone with this disease will develop colon cancer at some point if the large intestine is not removed early in the course of the disease. This problem is always treated with surgery.



# Laparoscopic Colon and Rectal Surgery

## Laparoscopic Resection for Polyposis

- ◆ The operation involves removing most or even all of the colon, in which case a reservoir is created from the end of the small bowel so that you can still have a bowel movement (defecate) the normal way.
- ◆ This is a complex operation, even as an open procedure, and only a few surgeons perform this laparoscopically.



# Benign (non-cancerous) problems which may require surgery

- **Inflammatory Bowel Disease –**

  - Crohn's Colitis

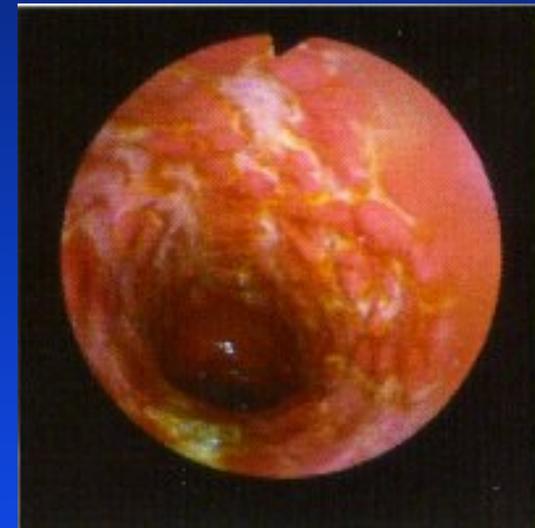
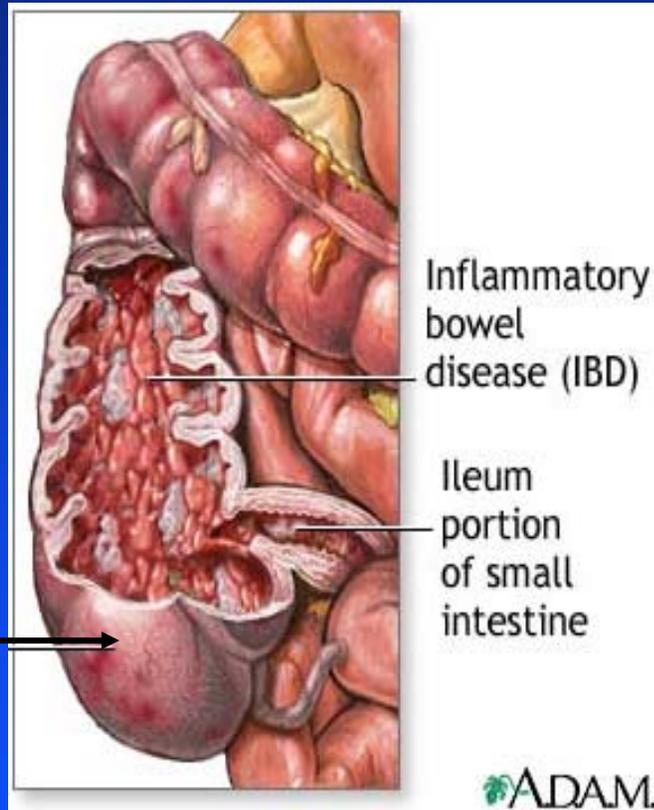
  - Ulcerative Colitis

**Diseases which can cause pronounced inflammation and destruction of the lining of the Large Intestine. When the symptoms are severe or cannot be controlled with medical therapy, surgery to remove the colon and/or rectum may be necessary.**



# Benign (non-cancerous) problems which may require surgery

Large intestine



View inside of the colon – inflamed and irritated tissue



# Laparoscopic Colon and Rectal Surgery

## Laparoscopic Resection for Crohn's Disease

- ◆ Patients with Crohn's disease have a 50% lifetime risk of needing an operation at some point in their lifetime. After the, there is again a 50% risk of needing another operation.
- ◆ The commonest site of Crohn's, at the end of the small intestine, is also the easiest to perform laparoscopically. Some surgeons now consider this approach to be their first choice.
- ◆ The laparoscopic approach may reduce the formation of adhesions, and thus allow subsequent operations to be performed laproscopically too.



# Laparoscopic Resection for Crohn's Disease

This demonstrates the 3 small incisions often used for Crohn's disease. Here the diseased colon has been removed through a 4cm (2 inch) incision around the navel.



# Laparoscopic Colon and Rectal Surgery

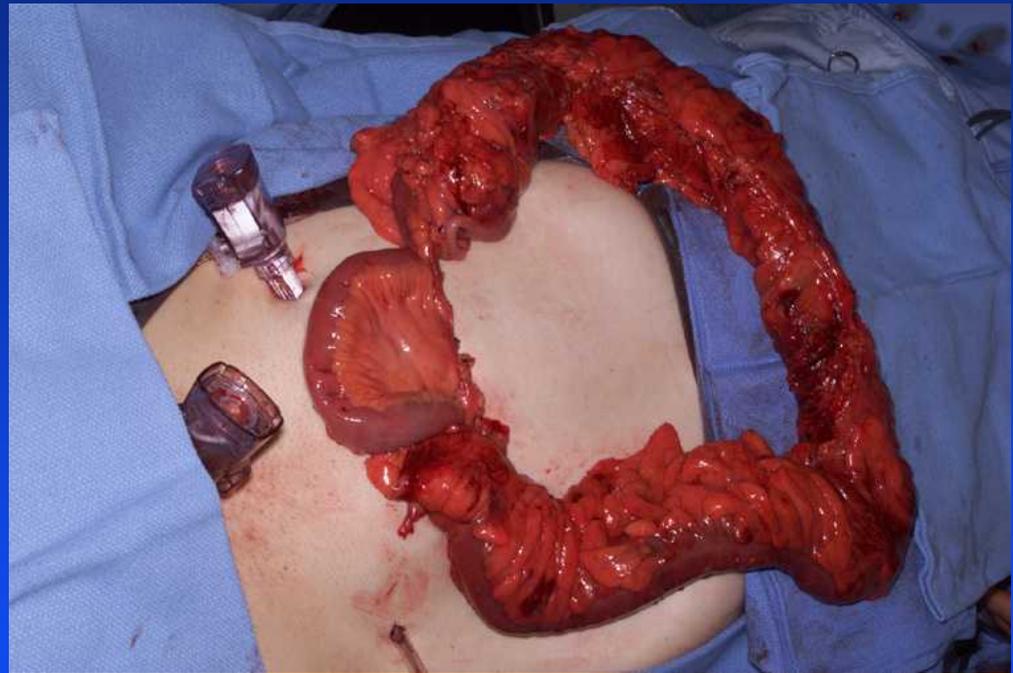
## Laparoscopic Resection for Ulcerative Colitis

- ◆ Surgery for ulcerative colitis involves removing the entire colon and rectum, and, where indicated, making a new reservoir (“J-pouch”) for stool from the small intestine.
- ◆ A few experienced surgeons can perform this procedure laparoscopically.
- ◆ The laparoscopic approach reduces the risk of adhesions and may reduce the risk of bowel obstruction, which occurs up to 30% of the time with open surgery.



# Laparoscopic Resection for Ulcerative Colitis

In ulcerative colitis the entire colon has to be removed.



## Laparoscopic Resection for Ulcerative Colitis



**Left: At the end of the operation, the incisions and ileostomy look like this.**

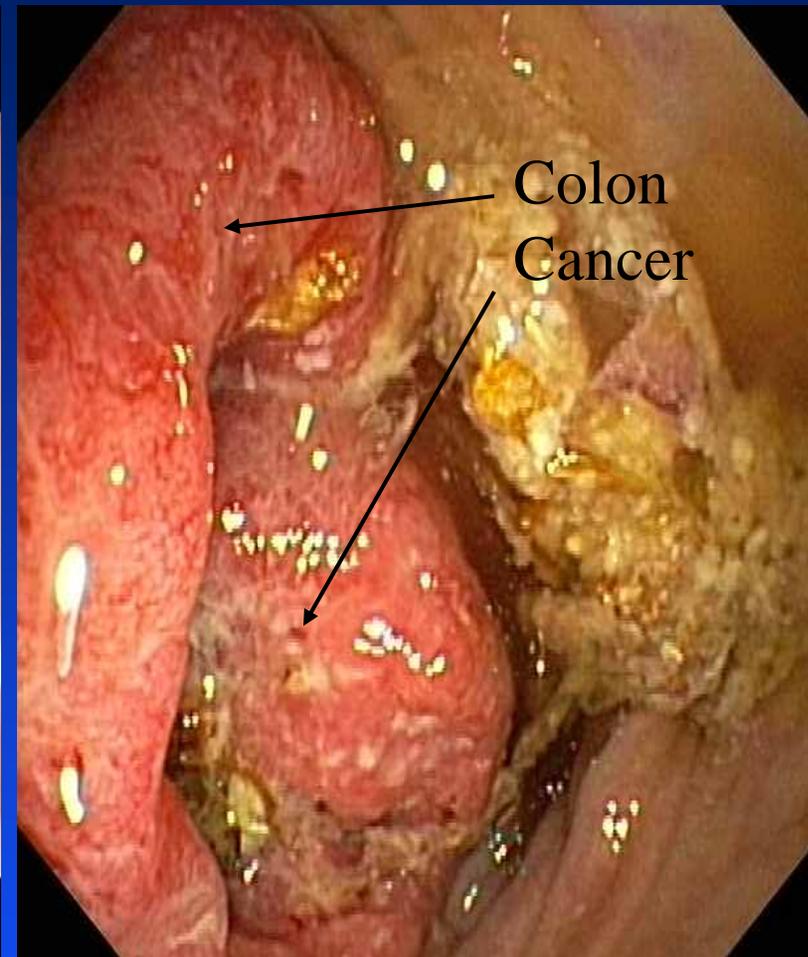
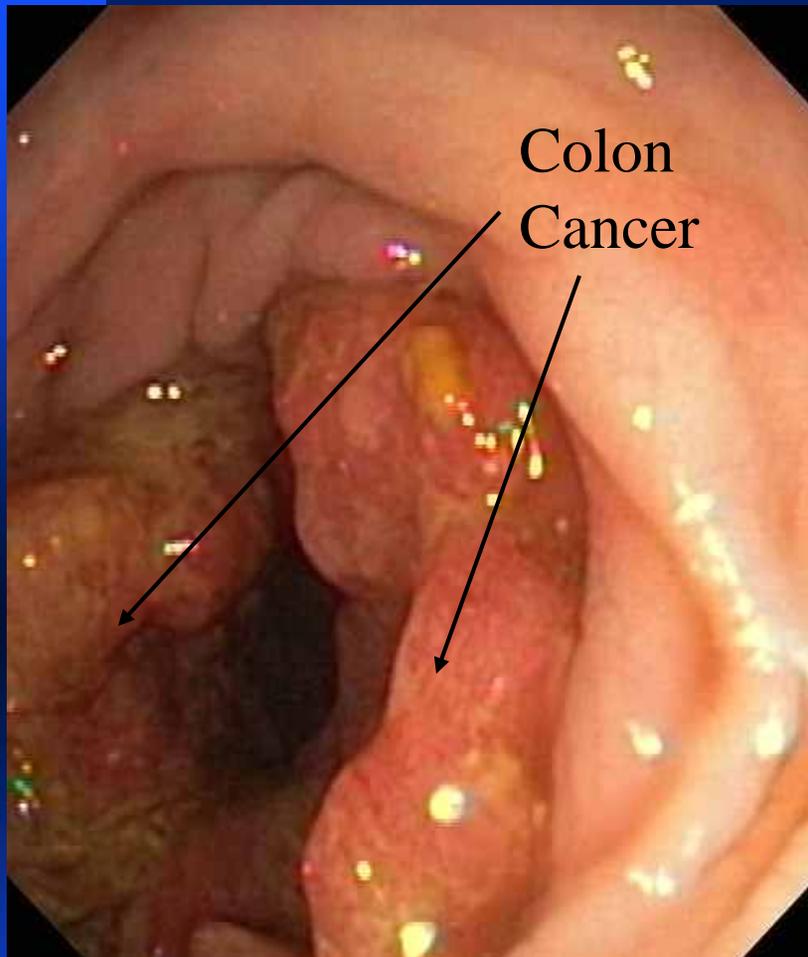
**Right: After 3 months the ileostomy is closed, and the final incisions are barely visible after healing.**



# Colon Cancer (Malignancy of the colon)

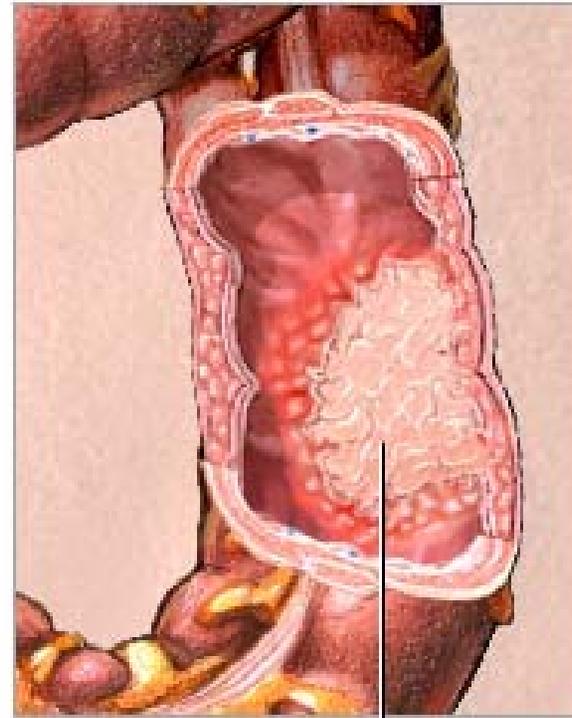
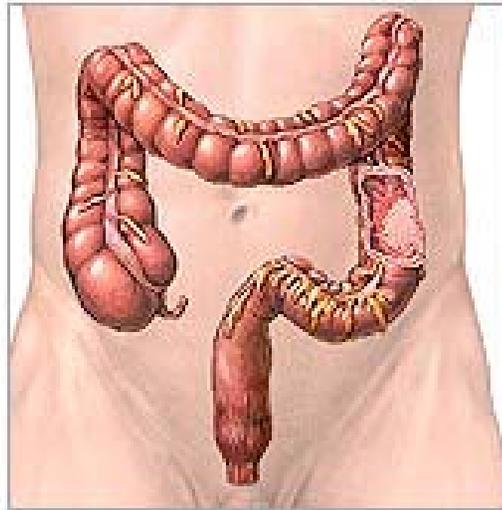
The treatment of colon cancer virtually always requires surgery (except in extremely early cases). Colon cancer is the 3<sup>rd</sup> most common cancer in the United States – each year over 150,000 new cases are diagnosed. When detected early, colon cancer is more than 90% curable. Please see our presentation on colon cancer screening and how you can maximize your chance of early detection at [www.Colonoscopy.info](http://www.Colonoscopy.info)





Pictures of a colon cancer seen during a colonoscopy (inside of the bowel)





Tumor

ADAM.

The colon cancer grows on the inside of the large intestine getting both larger and growing deeper as time progresses. The tumors usually have no symptoms until they become quite large in size.



# Laparoscopic Colon and Rectal Surgery

## Laparoscopic Resection for Colon and Rectal Cancer

- ◆ This is a very controversial topic, because early studies suggested that cancer came back more often in the small laparoscopic incisions than after open surgery.
- ◆ Most experts now agree that the risk of cancer coming back in the incision is about 1% in both open and laparoscopic surgery, *in experienced hands*.
- ◆ Some surgeons perform laparoscopic resection for cancer, while others are waiting for the results of a large national medical study to see if there is increased risk.



# Laparoscopic Colon and Rectal Surgery

## Laparoscopic Resection for Colon and Rectal Cancer

- ◆ If a laparoscopic approach has been recommended to you or if you are looking for this approach, be very sure that you understand the possible risks, *in your case*.
- ◆ Ask your surgeon how many cases that they have performed and what outcomes they have had with laparoscopic surgery for cancer. (See [Finding a Laparoscopic Surgeon](#))



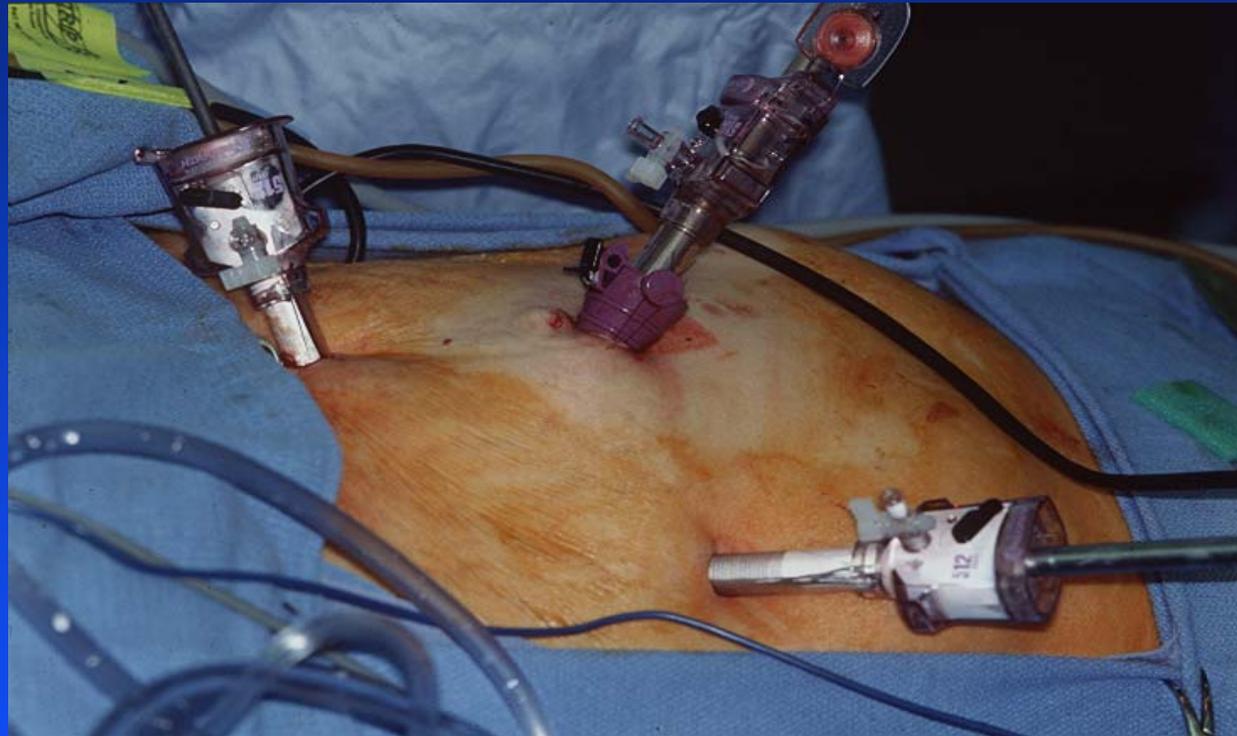
# Laparoscopic Colon and Rectal Surgery

## How is Laparoscopic Colon Resection Performed?

- ◆ The surgeon enters the abdomen by placing a canula (a narrow tube-like instrument) into the abdomen (belly) through a small incision (  $\frac{1}{4}$  –  $\frac{1}{2}$  inch) .
- ◆ Carbon Dioxide (CO<sub>2</sub>) gas is pumped into the abdomen through the port (canula) to “puff-up” or inflate the belly, making working room for the surgeon.
- ◆ A laparoscope (a tiny telescope connected to a video camera) is placed through the canula, and allows the surgeon to see a magnified lighted view of the internal organs on a TV monitor.
- ◆ 2-4 other canulas are inserted to allow use of special instruments to work inside the abdominal cavity (belly).
- ◆ If a portion of the colon is removed, one of the small canula incisions is slightly enlarged to permit removal of the tissue.



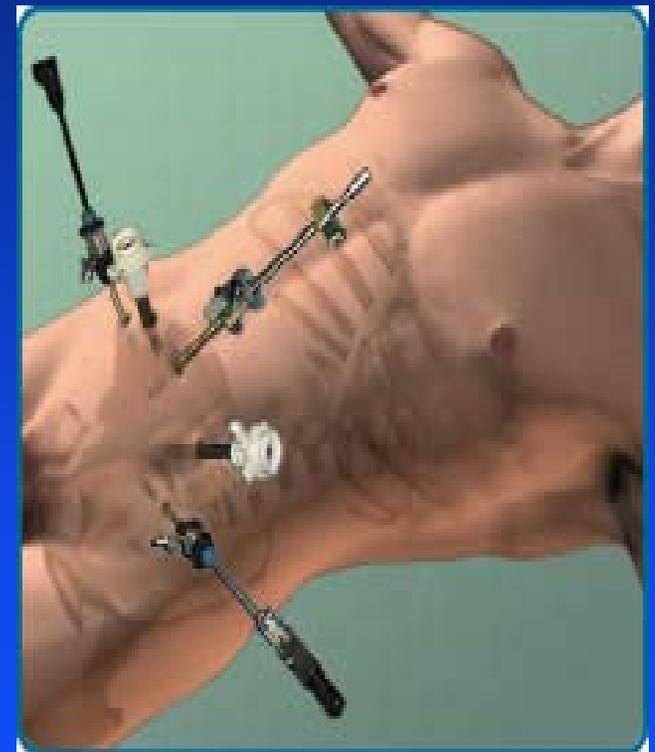
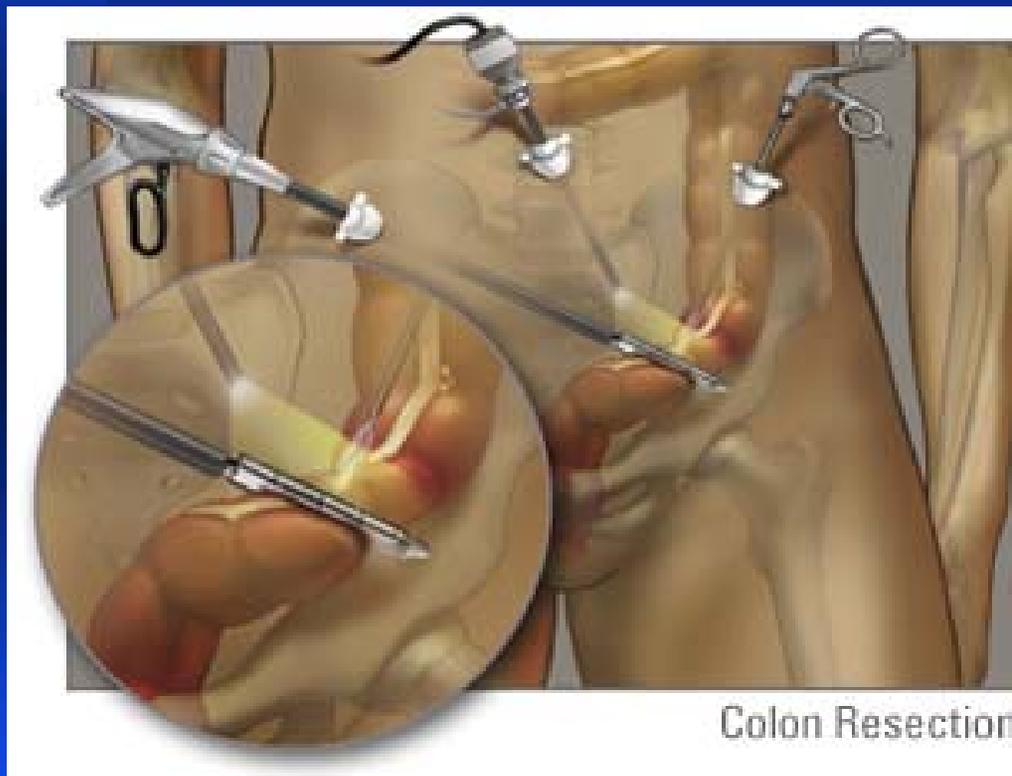
## How is Laparoscopic Colon Resection Performed?



This shows the “canulas” or tubes that are inserted to allow special surgical instruments to be used inside the abdomen.



# How is Laparoscopic Colon Resection Performed?



Schematic diagram of location of the instrument and camera portals to perform laparoscopic surgery on the colon or rectum.



# How is Laparoscopic Colon Resection Performed?



These are some of the specialized instruments that are used in laparoscopic surgery of the colon and rectum.



# Laparoscopic Colon and Rectal Surgery

## Advantages of Laparoscopic Colon Resection

Results vary depending on the procedure performed and the patient's overall health, but often include:

- ◆ Reduced postoperative pain
- ◆ More rapid return of normal bowel function
- ◆ Faster return to solid food
- ◆ Shorter hospital stay
- ◆ Faster return to everyday activities
- ◆ Improved cosmetic results
- ◆ May result in reduced formation of scar tissue inside the abdomen



# Laparoscopic Colon and Rectal Surgery

## What are the Possible Risks?

All operations have risks, but the chance of complications should be no higher than if the operation is done open. In fact, some complications may be less with the laparoscopic approach.

- ◆ Bleeding
- ◆ Infection
- ◆ Injury to other organs such as blood vessels, the ureter (carries urine from the kidney to the bladder), and the urinary bladder
- ◆ A leak from the connection that is made between the two ends of the intestine



# What are the Possible Risks?

- ◆ Blood clot in the veins of the leg or the lung
- ◆ Hernia
- ◆ Blockage or obstruction of the bowel
- ◆ Narrowing of the connection which is made between the two ends of the bowel
- ◆ Spread of cancer (if that is what the surgery is for) to one of the incisions
- ◆ Injury to the spleen
- ◆ Death



# Laparoscopic Colon and Rectal Surgery

## Am I a Candidate for Laparoscopic Surgery?

This depends considerably on the type of disease you have and how much of the colon needs to be removed. It also depends on the experience of your surgeon. Some factors, however, make a laparoscopic operation more unlikely:

- ◆ Obesity
- ◆ Prior operation on the abdomen resulting in scar tissue (adhesions)
- ◆ A history of bleeding problems
- ◆ Pregnancy



# Laparoscopic Colon and Rectal Surgery

## What types of colorectal operations can be performed laparoscopically?

- ◆ Limited (segmental) resections, such as removal of the right colon or the sigmoid (left) colon are the types of procedure most commonly performed.
- ◆ Operations involving removal of part or all of the rectum are also performed by some surgeons.
- ◆ A few surgeons with special expertise are able to remove the entire colon and rectum (proctocolectomy), a procedure that is indicated in certain diseases.



**This information is not intended to take the place of a comprehensive discussion with your surgeon about your need for colon or rectal surgery.**

