Ileal Pouch Anal Reconstruction

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What is ileal pouch anal reconstruction?

*Ileal pouch anal anastomosis reconstruction* (IPAA) is surgery to remove the entire colon and rectum. During IPAA, the surgeon makes a new rectum using a pouch made out of your small-bowel tissue. Most pouches are formed by folding the bowel tissue on itself like a “J,” but some are folded into “S” and “W” shapes. That is why they are called J, S, and W pouches.

**Rectal Mucosectomy**

When doing the IPAA surgery, your surgeon may use a surgical method called *rectal mucosectomy*. This process removes the lining (*mucosa*) from the very last part of the rectum and leaves just the outer wall of the rectum (without mucosa) in place. Leaving this section of the rectum in place may help you feel when the pouch is full and needs to be emptied. The decision whether or not to do a mucosectomy is based on your build, gender, and technical factors during the operation.

Rectal mucosectomy is usually done through the anus. The pouch is then attached inside the cuff of the rectal wall, either with sutures or surgical staples. In addition to possibly helping with the feeling of fullness, a rectal mucosectomy also lessens the amount of rectal mucosa left in place. Mucosa that is left in place may raise the risk for ongoing inflammation or possible cancer formation in patients who have *ulcerative colitis* (see page 3). Mucosa left in place also raises the risk for new *polyps* (growths) and cancer formation after surgery in patients with *familial polyposis* (see page 4).

But, the amount of anal muscle dilation needed for the mucosectomy may make the operation take longer. A longer operation may weaken the *anal sphincter*. The anal sphincter allows you to control bowel movements. If it is weakened, you may have difficulty controlling your bowel movements after surgery.
Types of Ileal Pouch

Ileal pouches are placed inside the pelvis so that patients can avoid having a permanent ileostomy (see description below). J pouches hold 2 to 3 times more than a normal loop of bowel, S pouches hold 3 to 4 times more, and W pouches hold even more. This extra room comes from the way the bowel is folded, sewn together, and then opened to make 1 larger pouch. This larger pouch is attached deep in the pelvis to the inside of the anus so that you may regain almost normal bowel function over time.

J pouches are the easiest to make, the most reliable, and can be made by stapling them in place. This makes the procedure much faster and more secure. J pouches work about the same as S and W pouches after 1 year. For these reasons, 98% (98 out of 100) of pouches made at University of Washington Medical Center (UWMC) and nationwide are J pouches.

The main reason to make an S pouch is that they are longer than a J pouch. This added length allows the bowel to reach into the deep pelvis. Another reason to make an S pouch is that a J pouch may not fit inside a narrow pelvis. The S pouch can be placed higher up in the pelvis.

Very rarely (less than 1%, or 1 time out of 100), the surgical team cannot get bowel to reach the pelvis using any kind of pouch. In these cases, the only option is a permanent ileostomy.

What is an ileostomy?

An ileostomy is an end or loop of ileum (part of the small bowel) that is brought outside the body through an incision in the abdominal wall. It is sewn to the abdominal wall on the inside and then opened so that the bowel empties into a bag on the outside. This bag is secured to the patient’s abdomen. It must be emptied several times a day.

An ileostomy is basically the same as a colostomy, but a colostomy is made out of colon rather than small bowel. And, since ileostomy waste is more watery and more irritating to skin than stool, ileostomies usually are placed away from the skin. This allows the bowel contents to empty into the bag better, without touching your skin.

Continent Ileostomy

There are many different ways to make ileostomies. A continent ileostomy (such as a Koch or Barnett pouch) is an ileostomy that does not require you to wear a bag. This is done by creating a pouch inside the abdomen.

Contents of the intestine are stored inside the pouch. An outlet valve is made during surgery. It prevents leakage until the pouch is drained by a tube that passes through the ileostomy. It must be drained several times a day.
Although a continent ileostomy is the best option for some patients, especially those who have poor anal sphincter muscle function, these pouches are prone to scarring and breaking down. For many patients, surgery to repair or make a new pouch will be needed. This will use more of the small bowel. Very few patients receive continent ileostomies.

**Why do I need IPAA surgery?**

*Ulcerative Colitis (UC)*

The most common reason to have pouch surgery is *ulcerative colitis* (UC). This is an inflammation of the innermost lining (*mucosa*) of the colon and rectum.

UC is often seen during a colonoscopy and always clearly seen in biopsies of the bowel. We do not know why this disease occurs. A great deal of research is being done to answer this question.

Not all patients with UC need surgery. Many either have mild symptoms, or the disease only flares up once in a while and is treated, and then subsides. These patients often do best being treated with medicines.

Patients with more severe UC often have bloody stools, severe cramps, and pain. These symptoms require repeated stays in the hospital for treatment or long-term use of drugs such as prednisone (a steroid medicine). Side effects from these drugs may be severe. Patients with severe UC often have surgery to remove the inflamed colon and rectum, so that the potentially harmful drugs can be stopped.

Sometimes, UC worsens so quickly that the bowel may rupture internally. This is called *toxic colitis*. Toxic colitis is a life-threatening condition that often requires emergency surgery.

Other patients have active ulcerative colitis that never flares up seriously for years, but over time they develop an increasing risk of cancer. Patients with ulcerative colitis that is active for more than 10 years need to be concerned about this cancer risk and should be screened with routine colonoscopies.

Biopsies done at the time of colonoscopy are checked for cancer and *dysplasia* (abnormal cells). Dysplasia is a strong predictor of increasing cancer risk, and it often indicates that the rectum and colon should be removed before a cancer can develop or grow out of control.

*Crohn’s Disease and Indeterminate Colitis*

Another kind of inflammatory bowel disorder is *Crohn’s disease*. Ulcerative colitis involves the colon and rectum and never affects the small bowel, stomach, esophagus, or other parts of the gastrointestinal tract. In Crohn’s disease, all parts of the gastrointestinal tract – from the mouth to the anus – might be affected. Also, the disease usually involves the full thickness of the bowel wall, not just the mucosa.
Sometimes it can be hard to tell if a patient has Crohn’s disease or ulcerative colitis. Doctors look at the patient’s symptoms, whether there are inflamed areas next to unaffected areas, and biopsies. The correct diagnosis is very important because patients with ulcerative colitis are candidates for IPAA operations.

Patients with Crohn’s disease are generally not offered IPAA. This is because Crohn’s patients often heal slowly and may not heal completely. Also, intestinal pouches in Crohn’s patients tend to break down and leak, and often fistulas develop. Fistulas are abnormal connections that form from the pouch to the other bowel, to the skin, or to other organs such as the bladder or vagina.

Unfortunately, we cannot tell whether some patients have Crohn’s disease or ulcerative colitis. These patients receive the diagnosis of “indeterminate colitis.” Since 90% (90 out of 100) of these patients do have ulcerative colitis, we usually offer them a pouch operation if they need to have their colon and rectum removed. Most do well. About half of the Crohn’s patients who receive a pouch will have to have it removed, usually because of complications that prevent full healing.

**Familial Polyposis (also called adenomatous polyposis coli or APC)**

*Familial polyposis* is a genetic disorder that is either inherited (passed from parent to child) or occurs because of a new *genetic mutation* (changes in the body’s cells). People with this condition develop polyps in the colon and rectum that will lead to cancer if they are not treated. These polyps can develop as soon as late childhood.

Patients with these polyps may have normal bowel function and not have any symptoms, or they may sometimes have bloody stools. Usually, patients with untreated familial polyposis develop cancer by age 35. This cancer can grow very quickly and be incurable by the time it causes symptoms and is diagnosed.

Because of this high cancer risk, patients with familial polyposis are usually advised to have their colon and rectum removed. Ileal pouch reconstruction is often done to avoid a permanent ileostomy.

Unfortunately, patients with familial polyposis are also at risk for other disorders. Polyps that may require surgery may form in the upper part of their gastrointestinal tract. Some of these patients (5% to 15%, or 5 to 15 out of 100) are also likely to develop tumors called *desmoids* after bowel surgery. These desmoids often form in the abdominal wall or *mesentery* (membranes) of the small bowel surrounding the blood vessels that supply blood to the bowel. Desmoids can be difficult to manage, depending on where they are.
After the colon and rectum are removed, in a surgery called a total proctocolectomy, patients with familial polyposis must be watched for a long time for desmoids and other problems. They should have exams of the stomach and first part of the small bowel with an endoscope, as well as thorough physical exams. An endoscope is a narrow tube with a camera on the end that allows your doctor to see inside your body without surgery. Once familial polyposis is found in a patient, their close family members should also be checked for it.

How can IPAA surgery help?

The 2 goals of surgery for ulcerative colitis and familial polyposis are:

- To remove the diseased organs (the colon and rectum).
- To rebuild the gastrointestinal tract so that it works as well as possible, taking into account what is best for the patient.

For most patients, surgery involves replacing the rectum with an intestinal pouch placed inside the pelvis. This pouch empties through the anus. The muscles of the anus act as the valve that controls emptying. If a patient has poor anal muscle function, is over 60 years old, and has poor general health or not enough intestine to make a pouch, a permanent ileostomy may be needed.

While both goals may be met during 1 operation, some patients need 2 or 3 operations to safely meet both goals. Each surgery option has benefits and risks. The best option is the one that has the least amount of risk and gives the best chance for a healthy life after surgery.

Indications for Surgery

The 3 indications for surgery are:

1. Ulcerative colitis that:
   - Is not controlled by medical treatment.
   - Is controlled with medicine therapy, but the drugs are causing complications or side effects that the patient cannot live with.
   - Involves bleeding, recurrent hospitalizations, or a life-threatening risk of perforation.
   - Is linked to dysplasia or cancer.

2. Indeterminate colitis (usually ulcerative colitis).

3. Familial polyposis.

To be considered for surgery, a patient must be healthy enough to handle the stress of general anesthesia and a major surgical procedure, and still be able to heal. Overall health is an important factor in patients who are
very ill from ulcerative colitis or who have had severe side effects from drug therapy (with Prednisone and/or Imuran). Drug therapy can control the disease in some patients, but it also increases the risk of poor healing and complications after surgery. Some of these possible complications are infection, pouch leakage, and opening of the surgical wound.

**Surgery Options**

The 4 options for surgery are:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1</td>
<td>1-stage IPAA</td>
<td>1 surgery to remove the rectum and colon and do the IPAA. An ileostomy is not made, and a mucosectomy may or may not be done.</td>
</tr>
<tr>
<td>Option 2</td>
<td>2-stage IPAA</td>
<td>2 surgeries: One to remove the rectum and colon and do IPAA, with a temporary ileostomy, with or without mucosectomy. A second operation is done to close the ileostomy.</td>
</tr>
<tr>
<td>Option 3</td>
<td>1-stage permanent ileostomy</td>
<td>1 surgery to remove the rectum and colon and create a permanent ileostomy.</td>
</tr>
<tr>
<td>Option 4</td>
<td>2- or 3-stage IPAA</td>
<td>2 or 3 surgeries: One to remove the colon and leave the rectum with a temporary ileostomy. A second surgery later to remove the rectum and IPAA, with or without mucosectomy. A possible third surgery to make another temporary ileostomy.</td>
</tr>
</tbody>
</table>

Factors that determine which surgery option is best for you include:

- Your age, weight, gender, and general health.
- The type of disease you have: ulcerative colitis or familial polyposis.
- The type of medicines you are taking, how long you have been taking them, and any side effects you are having.
- Continency (ability to control bowels).
- Whether you have had abdominal surgery in the past, especially bowel surgery.
- Your nutritional status based on foods you are able to eat and nutrients your body can absorb.
- Technical factors during the actual operation, *anastomoses* (see definition on page 22), and how healthy your intestinal tissues are.
This table shows which surgery option may be best for you, based on your health status.

<table>
<thead>
<tr>
<th>Option</th>
<th>Age (yrs)</th>
<th>General Health</th>
<th>Long-term Steroids</th>
<th>Continency</th>
<th>Abdominal Surgery in the Past</th>
<th>Nutritional Status</th>
<th>Technical Factors During Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60 or younger</td>
<td>Good</td>
<td>No</td>
<td>Good</td>
<td>Minimal</td>
<td>Good</td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>60 or younger</td>
<td>Fair</td>
<td>Possibly</td>
<td>Good</td>
<td>Minimal</td>
<td>Fair</td>
<td>Possible</td>
</tr>
<tr>
<td>3</td>
<td>Older than 60</td>
<td>Fair to poor</td>
<td>Possibly</td>
<td>Poor</td>
<td>Common</td>
<td>Poor to fair</td>
<td>Possible</td>
</tr>
<tr>
<td>4</td>
<td>60 or younger</td>
<td>Poor</td>
<td>Often</td>
<td>Good</td>
<td>Minimal</td>
<td>Poor to fair</td>
<td>Possible</td>
</tr>
</tbody>
</table>

**Option 1: 1-Stage IPAA**

The 1-stage IPAA surgery is done for patients who are younger than 60, have good continency, good general health, and no long-term steroid treatment. The surgeon has confidence that the technical steps of the operation will go well in these patients. Most patients with familial polyposis or well-controlled, stable ulcerative colitis may be considered for a 1-stage procedure. These are most often planned rather than emergency operations.

The surgeon completes the entire procedure and pouch reconstruction during 1 operation. The benefit of this 1-stage surgery is that when everything heals well, patients do not need more surgery. But, there are some disadvantages:

- Right after surgery, many patients have some incontinence from stretching of the anal sphincter during the surgery.
- The stool that must be emptied from the pouch about 12 to 15 times a day is very irritating to the skin. This is why many patients develop a sore and tender bottom, like a diaper rash. After the pouch stretches and can absorb more, it will need to be emptied less often.
- The pouch must work right away. If there is a leak or other problem, patients can get *peritonitis*, a serious infection. This means emergency surgery is needed to drain the pouch and create an ileostomy to divert waste away from the pouch. Although this is a rare problem, these ileostomies must be kept for months while the abdomen heals. The scarring that forms when the leak heals may weaken or constrict the pouch. This can make the pouch not work as well long term and may cause a greater risk of bowel obstruction over time. It may also lead to infertility for women of childbearing age, because of scarring of the Fallopian tubes.

If there is any serious question about your ability to heal, the strength of your tissues, or the soundness of the pouch, it may be safest to do a temporary diverting ileostomy. Often, the decision not to do an ileostomy can only be made during the last hour of the operation.
Option 2: 2-Stage IPAA

The 2-stage IPAA procedure involves a pouch and temporary diverting ileostomy. It is usually offered to patients who have poor nutrition or long-term steroid use. Their illness, nutrition status, or medicines put them at risk for good wound healing. Patients may also be considered for a 2-stage procedure because their disease increases the risk of complications from pouch leakage or failure.

During the first surgery, a temporary ileostomy is created to divert the bowel contents away from the pouch. This allows the pouch to heal, and makes it easier to manage any leak. Ileostomies in IPAA patients are often made from a loop of bowel. These ileostomies may not stick out much from the abdomen because of how they are attached to the pelvis.

After X-rays show the pouch has healed and the pouch-anal anastomosis is strong, the temporary ileostomy is closed. This second surgery will last 1 to 2 hours. The patient will stay in the hospital for 3 to 4 days after this operation.

Option 3: 1-Stage Permanent Ileostomy

A permanent ileostomy is considered for patients older than 60, patients who have stool incontinence or poor anal sphincter function, and patients with other medical problems that would restrict their ability to heal well and develop a working pelvic pouch. This is usually the simplest of the options with the easiest recovery. But, the patient will have a permanent stoma. If the anal sphincter mechanism is removed, it usually means a pelvic pouch cannot be created later, since the valve mechanism needed for the pouch has been removed.

Option 4: 2- or 3-Stage IPAA

Usually, only patients who have ulcerative colitis and are very ill from their disease are considered for a 2- or 3-stage procedure. Some reasons to consider this option are malnutrition, severe bleeding in the colon that is causing anemia, high-dose steroid use, and many or prolonged hospital stays to treat colitis.

The goal of the first surgery is to remove most of the disease. This means removing the colon and leaving the closed-off rectum in place while creating a temporary ileostomy. With most of the diseased bowel removed and the rectum no longer passing stool, the disease is usually much easier to control. Amounts of steroids and other medicines being taken can be lessened and often stopped over time. Bleeding from colitis stops and the patient’s nutrition improves because they can eat without bleeding and causing the colitis to act up.
The second surgery is done once the patient has healed, is in better health, and usually no longer taking any steroids (except for steroid enemas once in a while to control rectal disease). This surgery is to remove the rectum and create an ileal pouch that is placed inside the pelvis.

Depending on how this operation goes and how well the patient has healed, another diverting ileostomy may be created to allow the pouch to heal. In this case, a third operation, to close the stoma (ileostomy), will be needed. Or, in some cases, an ileostomy is not made and the pouch is allowed to start working right away. (See Options 1 and 2 about the advantages and disadvantages of creating or avoiding a temporary ileostomy.)

**Before Your Operation**

How you prepare for surgery depends on your situation and the type of surgery you are having.

**Medicines**

If you are taking steroid medicines such as prednisone, reducing the dose of prednisone may help lessen the risks of surgery. But, your dose should not be reduced low enough to cause more malnutrition, bleeding, a lot of diarrhea, and a more severely inflamed bowel. These conditions create a greater risk for complications in surgery than a higher dose of prednisone does.

If you have been on prednisone before surgery, it is very important to continue taking some, even if the dose is lower. Suddenly stopping this drug may lead to life-threatening complications.

Stop taking Imuran at least 1 week before surgery to prevent problems with healing. Your doctor will manage any other medicines as needed. In general, if you are taking medicines for hypertension and diabetes, you should keep taking these right up to the time of surgery. Your surgery or pre-surgery team will tell you if there are any changes needed for the day of surgery. Also, see “Consultations” section on the next page.

**Colonoscopy and Endoscopy**

You should have a colonoscopy within 6 months of your surgery to lower the risk of an unsuspected cancer in your colon or rectum. If you have familial polyposis, you should have an upper endoscopy to check for adenomas (polyps) in your stomach or duodenum (first section of the small intestine).
**Tests Before Surgery**

You may have a chest X-ray, cardiogram, and blood tests. The results of these tests will help us manage your anesthetic and will help avoid the risk of clotting problems that might lead to unexpected bleeding during surgery.

If you are anemic, we will prepare blood for possible transfusion during or after your operation. It is rare to have a major blood loss (over 500 cc) with these operations. If you want to avoid transfusion under any circumstances, please tell us when you sign the consent form for your surgery.

**Consultations**

You may be evaluated by our medical consultation team as a part of your preparation for surgery. This is a team of doctors who work with Surgical Services to help manage complex medical conditions such as diabetes, hypertension, and heart and lung diseases during surgery and recovery. You will also be evaluated and counseled by the Pre-Anesthesia Clinic.

If you are likely to need an ileostomy, you will also meet with the nurse enterostomal therapists, who will give you more information and help with stoma management. These nurses specialize in caring for patients who have stomas (an opening in the abdomen created during surgery).

**How to Prepare for Your Operation**

**Things to Remember**

- **Aspirin and other medicines:** Do not take any aspirin or other products that affect blood clotting for 1 week before your operation. Two of these are ibuprofen (Advil, Motrin) and naprosyn (Aleve, Naproxen). See attached sheet for more information.

- **Shaving:** Do not shave any part of your body that you do not already shave every day. If you normally shave near your surgical site, do not shave that area for 2 days (48 hours) before your surgery.

- **Hospital stay:** You will stay in the hospital for 7 to 10 days after your operation. When you go home, you will need someone to help you prepare food and do household chores for 2 to 3 weeks.

- **Coughing and deep breathing:** Your nurse will teach you coughing and deep-breathing exercises. These are important to do after surgery to help prevent pneumonia.
24 Hours Before

- **Take 2 showers:** Take 1 shower the night before and a second shower the morning of your operation. Use the antibacterial soap your nurse gave you to wash your body.
  
  Do not use the antibacterial soap on your face and hair. (See directions that came with the soap.) Use your own soap and shampoo on your face and hair. Use clean towels to dry off, and put on clean clothing.

- **Arrival time:** The pre-surgery nurse will call you by 5 p.m. the night before your operation. If you are having surgery on a Monday, the nurse will call you the Friday before. If you do not hear from the pre-surgery nurse by 5 p.m., please call 206-598-6334.
  
  The pre-surgery nurse will tell you when to come to the hospital and will remind you:
  
  - Not to eat or drink after a certain time.
  - Which of your regular medicines to take or not take.
  - To sip only enough water to swallow your pills.

- **Heating blanket:** To reduce your risk of infection, you will be covered with a heating blanket to warm your body while you wait to go into the operating room. Ask for a heating blanket if you do not receive one.

**Bowel Preparation**

Just before surgery, you will be asked to use a laxative such as Colyte, to help clean your bowel, and to take some oral antibiotics. You will receive written instructions for these in the clinic. These 2 steps to prepare your bowel are very important since a cleaner bowel will lessen complications after surgery. Stool and fluid left in the colon and rectum will raise your risk of infection. You are also more likely to need a temporary ileostomy, due to spillage or other problems.

**Informed Consent**

*Informed consent* is permission from you to do your surgery. We hope that this document helps you become better informed about the complications and possible outcomes of this type of surgery. It is very important that you understand what your surgical plan is, how it may change, and what complications may occur.

**We cannot avoid all complications. But, our job is to detect them as soon as possible and to correct them quickly to lessen the risk of more problems.**
Arriving at the Hospital

You will probably arrive at the hospital on the day of surgery, unless you are already in the hospital because you are very ill from severe colitis. All preparation for the surgery is usually done before the day of surgery.

The schedule for the surgery day is decided the evening before. This allows staff to see the entire schedule of operations and to make sure that the right medical staff and equipment are available for each operation.

The Pre-Surgery Clinic will call you by 5 p.m. the night before your operation to let you know your time of arrival. If your surgery is on a Monday, they will call you the Friday before.

Sometimes unexpected delays, longer operations, and emergencies can change the schedule even on the day of surgery. If your surgery is delayed, we will tell you and your family as soon as possible and keep you informed about when we can begin your surgery.

The Surgery

The stages of your operation depend on which surgery option you are having. This handout describes the basic parts of the operation. On average, these operations take 4 to 7 hours to complete, depending on the exact procedure and your condition.

Your Health Care Team

UWMC is a teaching hospital. Nurses, medical students, and resident or surgeons in training are all important members of your health care team. But, your attending surgeon is the main person responsible for all aspects of your care. You, your family, and your attending surgeon will work together to make all major decisions about your care.

Your attending surgeon will do your operation. Many nurses, 1 or more medical students, and resident surgeons will assist your surgeon. This team will constantly review your health status to help your attending surgeon keep fully aware of all your vital signs and laboratory results that affect your outcome and recovery.

Having a team working for you is a great advantage. It also helps train new doctors in a real-life setting.

Anesthesia and Preparation

You will receive the anesthetic in the operating room (OR). You may also receive a mild sedative before you enter the OR. And, you may also receive an epidural anesthetic, a tube that carries numbing medicine to your spine to block pain signals. An epidural is very safe
and is often used along with anesthesia drugs given by IV (intravenously).

Epidural catheters are used for managing anesthetic during the operation. In most patients, they also work well for pain control after surgery.

**In the Operating Room (OR)**

When you arrive in the OR, you will be connected to monitors and you will receive the anesthetic through an intravenous line (IV, a thin tube that delivers medicine into a vein). This will make you fall asleep. Many different medicines are used for the anesthetic. Your anesthesiologist will talk with you about these medicines during your pre-anesthesia visit and again right before surgery.

After you are asleep, a ventilator will breathe for you. You may have a tube inserted through your nose that goes into your stomach. This is called a nasogastric tube (NG tube). You will also have a catheter inserted into your bladder to drain urine. This urinary catheter is usually left in place for 4 to 5 days after surgery, or until the epidural catheter is removed. More IVs may also be inserted if the anesthesia team decides they are needed.

Depending on what surgery you are having, you may be positioned lying on your back and carefully padded and secured. Or, your legs may be placed into secure holders that give the surgical team better access for removing your rectum and attaching the pouch inside your anus. A heating blanket will be used to keep your temperature normal during your operation. This lessens the chance of infections or other complications after surgery.

**Incision**

For most patients, the abdominal incision goes up the middle of their abdomen, from the pubic bone to above the belly button. How far above the belly button the incision goes depends on how easy it is to move your colon and small bowel.

**Colectomy (removing the colon)**

Removal of the colon is done by dividing:

- Attachments of the right and left colon to the side walls of the abdominal cavity.
- Any adhesions (scars) to other organs such as the liver, gallbladder, or small bowel.
- Attachment of the omentum to the colon. The omentum is a sheet of fatty tissue that extends from the stomach to the colon.
- Blood vessels to the colon.
The attachments and blood vessels are closed off with surgical sutures or clips. If your colon is very inflamed, your bowel may be paper-thin and very fragile. Your surgeon will be very careful to lessen the risk of a tear in the bowel that might lead to spillage of bowel contents inside the abdomen. Surgical stapling devices are often used for parts of this surgery.

**Proctocolectomy (removing the rectum)**

Removing the rectum takes special care. The ureters (tubes that carry urine from the kidneys to the bladder) are identified and protected. In men, the nerves that support potency (the normal erectile function of the penis) are also protected.

The blood vessels of the rectum are cut, moving from the upper rectum to the lower rectum. Each one is closed off with sutures or clips. Special retractors are needed to do surgery in the deep pelvis. Retractors are surgical tools used to pull back organs or tissue.

Part of the procedure may be done from below, through the anus. When this is done as part of Option 1, 2, or 4, the purpose is to strip the mucosa (the inner lining) of the bowel off the very last part of the rectum, leaving the muscles of the rectal wall in place. This is called a mucosectomy. It is done to help preserve sensation in the pouch that replaces the rectum. Sensation also remains in the muscles of the pelvic floor, even if the entire rectum is removed.

Mucosectomies are done less often now because they can increase the risk of incontinence that occurs when the anal muscles are stretched. This stretching must be done in a mucosectomy. When rectum removal is done as part of Option 3, the surgeon makes an incision and removes the anal muscles. This incision is sewn closed to heal.

**J Pouch (pouch to replace the rectum)**

The most common pouch, the J pouch, is usually made with a special surgical stapler. This device lays down 4 rows of staples and cuts between the 2 middle rows. The staples secure the 2 loops of bowel together, and the cut joins the 2 lumens (open space inside a tube-shaped organ) into 1 big cavity, forming the pouch. The J is measured at 15 cm (6 inches). Another stapler is often used to attach the pouch just inside the anus. This anastomosis may also be sewn by hand.

**Ileostomy (creation of a stoma)**

If you need an ileostomy because of weak tissues, a poor bowel preparation, an incomplete staple line, or if you are having Option 3 (permanent ileostomy), either the end of the bowel or a loop of small bowel is brought through a small hole made in your
abdominal wall, usually in the right lower abdomen. The bowel is then secured inside and outside your body with sutures. A stoma appliance, a plastic bag with a special adhesive rim, is then attached to your skin around the stoma, and the stoma is allowed to heal.

**Closing the Incision**

Before your abdomen is closed, 1 or 2 drains may be placed into your pelvis, depending on your procedure. These drains will usually be brought out through small incisions in your lower abdomen and secured with a suture. The incision is then closed in several layers. An inner layer closes the fascia, the muscle layer of the abdomen. Skin staples are usually used to close the skin layer. The incision is covered with a dressing (bandage). This dressing will stay in place for about 3 days.

**What happens after surgery?**

You should be able to cough, breathe deeply, and move around in bed several hours after surgery. Within 24 hours, your nurse will help you get out of bed and sit up in a chair. We will ask you to walk in the hall by the 2nd day after surgery.

Most patients are in the hospital for 5 to 8 days. Your length of stay will depend on your age, the extent of your operation, and how quickly you are recovering. You must be able to care for yourself, walk, dress yourself, eat well, and have good bowel function before you can leave the hospital. You must also have good pain relief with oral pain medicines and have no signs of infection, bleeding, or any other complications.

If you have an epidural catheter for pain management, you may have difficulty urinating until the epidural is stopped. Any surgery involving the pelvis, even without an epidural catheter, can cause difficulty with urination for 4 to 7 days. For this reason, we leave the urinary catheter in at least 4 days or longer if the epidural catheter is still being used for pain.

**Pain Management**

If you have an epidural catheter, you may use it for pain. If you do not have one or it does not work, you will use a PCA (patient controlled analgesia) pump to give yourself small amounts of pain medicine when you need it. This means you do not have to wait for the nurse or another caregiver to give you pain medicines.

**If you have a PCA, only you should use it.** Your nurse, other caregivers, and family members should not give you pain medicine through your PCA.
Your pain medicine will probably need to be adjusted as you recover. You must take enough pain medicine so that you can do your breathing exercises and get out of bed. But, taking too much pain medicine may slow your breathing and put you at risk of aspiration (fluid buildup in your lungs). Too much can also make you so sleepy that you cannot help with your own recovery.

We will do everything we can to keep track of your pain levels and change your dose, the way you receive pain medicine, or the medicine itself. We will try to help you be as comfortable as possible.

Before discharge (leaving the hospital), you will change to an oral pain medicine, usually oxycodone or Percocet (a mixture of oxycodone and Tylenol). If you have allergies to these drugs or they give you nausea, you may be given Vicodin or another medicine. Even though these pain medicines cause constipation, stool softeners are usually not needed after this operation since the colon has been removed.

First Stages of Recovery

If your surgery was done to treat ulcerative colitis, you may feel better right after surgery. This is because the source of your chronic illness and inflammation was removed. If your bowel function was poor and you often had bloody bowel movements, you should see a lot of improvement.

If you had the surgery for familial polyposis, you probably did not have many symptoms before surgery. Your recovery may be more difficult, since you did not have serious symptoms of illness before surgery.

You will need to empty your ileostomy pouch 4 or 5 times a day, depending on your diet and fluid intake. You may get burns on your skin around the stoma if there is a leak or if the appliance does not fit well. These problems will lessen as you learn how to manage the pouch and your ileostomy begins to work better.

Ileal pouches work well, but for most patients they never replace or function as well as a normally functioning rectum. Even so, the ileal pouch is a better option than a permanent ileostomy for most patients.

The Stoma

Many different sizes and styles of stoma appliances are available so that the best fit can be made. Some are 1-piece, others come in 2 pieces (bag and skin adhesive patch). If you need a stoma, the enterostomal therapists will work with you to make sure that you understand how to fit, change, and manage your appliance. Some adjustments may be needed at first. As the stoma heals and swelling lessens, you may need a smaller size or shape.
Remember, like all other aspects of the healing process, if you have a stoma, you will need to be patient as you learn how it works and how to live with it. With time, the stoma will become part of your life and your lifestyle.

**Continency**

Bowel control is good but sometimes not perfect after an ileal pouch is created. Most patients are continent during the day, but may have minor incontinence during the night and will need to use a pad. Continency will improve over time as your sphincter muscles heal and become stronger. The consistency of your bowel movements will also get more solid.

If you have a working J pouch, you can expect 12 to 15 bowel movements a day at first. These will be loose and watery, and they may irritate the skin around your anus. Use zinc oxide ointment or Bag Balm to help protect your skin.

You may need to change your diet, use antidiarrheal agents, or take fiber supplements to help lessen the number of stools you have. You may need to use some or all of these remedies at first. As the pouch heals and your body adapts to it, you may be able to eat more foods, use fewer antidiarrheal agents, and take fewer fiber supplements.

To help make your sphincter muscles stronger, we urge you to do Kegel exercises both before and after surgery. These exercises will increase your sphincter strength, which will improve your continency. See the sidebar at the right for instructions on how to do a basic Kegel exercise.

**Diet Changes**

You will start off with a rather bland diet after surgery. Avoid foods and beverages that caused diarrhea before surgery. Drink fluids separately from solids, and do not wash down a meal with a large amount of liquid.

If you have loose stools very often or a high ileostomy output, you may become dehydrated and lose too much salt. If this happens, drink juice or liquids that have salt in them, such as Gatorade or Powerburst. If you feel more tired, are dizzy or thirsty, or you have low blood pressure, you may be dehydrated. **Go to the clinic or emergency room right away.** Often a quick IV and change in medicines is all that is needed. Rarely, patients must be readmitted to the hospital for several days of IVs and more treatment.

**Antidiarrheal Agents**

Most patients with a working J pouch start off taking an antidiarrheal agent such as **loperamide** (Imodium). You can buy Imodium without a prescription, but it costs less if you have a prescription.
Take 1 or 2 tablets of the Imodium, or 1 or 2 teaspoons of it in liquid form, before meals and before bedtime. This should slow your bowel transit time, which will improve absorption and lessen stool volume and frequency. After several months, you may be able to slowly use less Imodium, or use it only once in a while if you are having problems with diarrhea.

Patients with J pouches are always more likely to get diarrhea because they no longer have a colon. For example, a common head cold may cause diarrhea. It is a good idea to keep Imodium on hand, especially on trips and special occasions.

If you cannot take Imodium or it does not work well for you, we may try a stronger medicine such as Paregoric (tincture of opium). These stronger medicines may have side effects and are only used if needed.

**Dietary Fiber**

Some patients find that more fiber in the diet firms up their stool and makes it easier to evacuate. Others find that fiber increases volume. It is hard to tell ahead of time who will benefit from more fiber. We often try some fiber such as Metamucil or Fibercon to see if it will help. Add fiber only when there are no other changes in your medicines or diet so that you can clearly see what the effect of the fiber is.

**Activity, Weight Restriction, and Work**

- Your abdominal incision is also healing during your recovery. Do not lift anything heavier than 15 pounds or do heavy physical activity for 6 weeks after surgery. If you took steroids before surgery, follow these activity restrictions for 8 to 10 weeks to avoid getting a hernia.

- Do not drive while you are taking narcotic pain medicines. It is not safe. The medicine can make you sleepy and delay your reaction time.

- Once you are no longer taking pain medicine, you may drive as soon as you can comfortably grip the steering wheel with both hands. Most patients are off narcotic pain medicine by 3 weeks after surgery.

- You should be able to return to work 4 to 6 weeks after surgery if you do not have any complications.

**Later Stages of Recovery**

Over time, you will have fewer bowel movements. About 1 year after surgery, most patients have 6 to 8 bowel movements in a 24-hour period, with about 1 every 2 nights. But, some patients will have more, while others will have only 2 or 3 a day. Younger patients seem to be able to adapt more easily, and they generally have fewer bowel movements. Your bowel pattern may keep changing even after a year.
Follow-up Visits

You will return to the clinic 1 week and 1 month after your J pouch surgery. You will have more visits if they are needed. If you live outside the Seattle area, you may want to visit your local referring doctor for your follow-ups.

After the first 2 follow-up visits, you will likely return at 3, 6, and 12 months. Your doctor will make sure that you are doing well, progressing as expected, and changing medicines as needed. After that, you will need a follow-up visit once a year.

Regular (every 1 to 3 years) sigmoidoscopic evaluation and digital anal examination of your pouch will be done to check for stricture formation and pouch healing. These are done because of recent reports of dysplastic (precancerous) changes found during long-term follow-up of pouches. To date, no cancers have been reported in pouches.

Early Complications of Surgery

Cardiopulmonary Problems

The heart and lungs may be affected in any operation that uses anesthesia. Aspiration pneumonia (lung inflammation), cardiac arrhythmia (abnormal heartbeat), and myocardial infarction (heart attack) are all serious complications. The anesthesia is very carefully managed and these complications are rare, but they can be life-threatening. Older patients are at greater risk for these complications. It is very important to do your lung exercises after surgery to help clear secretions from your lungs and prevent pneumonia.

Deep Venous Thrombosis and Pulmonary Embolism

All patients are at risk for deep vein thrombosis (DVT, blood clots) forming in their legs during a long operation. If you have had DVT or pulmonary emboli (clots breaking off from the legs and going to the lungs) before, you are at very high risk. Signs of a DVT or pulmonary embolus include odd swelling, warmth, or pain in your calves, a fever, or shortness of breath after surgery.

- If you are at average risk for these conditions, you will have pressure stockings called sequential compression devices (SCDs) put on your legs. These stockings squeeze your calves and thighs to help blood flow during the operation.
- If you are at high risk, you may be given blood thinners before and after your operation to lessen your risk.
Infection

This surgery involves opening your bowel. Even with good bowel prep and antibiotics, there still may be contamination and a risk of infection from the open bowel. Infections are most common in the incision, but they can also occur in the abdomen and pelvis.

If you develop an infection in your pelvis, we will check first for a leak from your J pouch. To manage the infection, we must identify the extent of the problem using either a CT scan or surgery. If we do an operation, we create a stoma to divert the bowel if we find the infection is caused by an anastomotic (see below) or staple line leak. Then we drain the infection with surgical drains or drains that are placed using imaging techniques.

Infections can also occur in the urinary tract from the catheters that are placed during surgery, and in the lung (pneumonia).

Bleeding

Bleeding during or after surgery is rare in these operations, unless the patient has a disorder that affects their blood clotting. But, every patient is closely watched for signs of bleeding in the first 24 to 48 hours after surgery. If we see bleeding during this time, we may need to operate again. Or, we will keep close watch and will do transfusions to replace the blood you have lost.

Anastomotic Leak

A leak in the pouch, called an anastomotic leak, is a possible complication if you have Option 1 surgery or have an ileostomy that is closed after a while. This occurs in about 3% to 5% (3 to 5 out of 100) of patients. It is more common in new pouches that are used right away, compared to those that are first allowed to heal with an ileostomy.

When it occurs, anastomotic leak is seen within 2 to 5 days after surgery. Symptoms include abdominal and/or pelvic pain, fever, rapid heart rate, and blood tests that show a new infection or inflammation. In patients with obvious symptoms, an operation is needed right away to divert the bowel and drain the infection. In others with milder symptoms, we may do a CT scan or contrast study of the pouch to find the leak.

After the leak is treated and the patient recovers, the patient is often asked to wait 3 to 6 months before having surgery to close the stoma. Before that surgery, we will do many tests to make sure the leak has healed.

Anastomotic leaks may affect the pouch so that it never works as well.Leaks may also lead to infertility in some female patients because of scars that form on the Fallopian tubes.
**Early Small Bowel Obstruction**

Sometimes, patients who regain bowel function have a sudden onset of nausea, vomiting, abdominal distension, and decreased bowel function. These may be signs of an early bowel obstruction. It may be hard to tell this from a *postoperative ileus* (paralysis of the bowel). Studies of the bowel with CT scan and barium may be done.

All patients with a postoperative ileus and most with a postoperative bowel obstruction will get better with bowel rest, IV fluids, possibly another NG tube, and time. Some patients will need surgery to repair an early obstruction.

**Later Complications of Surgery**

**Pouchitis**

Pouchitis is an inflammation in the pouch that causes the same symptoms as ulcerative colitis. It tends to occur more often in patients with a history of severe ulcerative colitis. Symptoms of pouchitis are a sudden increase in the frequency of bowel movements and small stools, often with blood, pelvic pain, urgency, incontinence, and fever. It occurs in about 20% to 40% of patients (20 to 40 out of 100) who have pouch surgery. Some patients have pouchitis only 1 time, while others have it more. Narrowing of the pouch-anal anastomosis may cause pouchitis.

Treatment for pouchitis includes evaluating the pouch-anal strictures with an endoscopic exam of the pouch, followed by treatment with metronidazole (Flagyl), an antibiotic. Some patients need more antibiotics such as ciprofloxacin (Cipro).

Very rarely, aggressive inpatient treatment, with full bowel rest and steroid enemas is needed to treat pouchitis. Only 1% (1 out of 100) of patients have severe pouchitis that does not respond to treatment. For these patients, the pouch must be removed.

If you have recurring pouchitis, keep Flagyl at home and bring some with you when you travel. Use it at the first sign of the disease.

**Pouch-anal Anastomotic Stricture Formation**

_Pouch-anal anastomotic stricture_ is a narrowing of the anastomosis between the pouch and the inside of the anus. This narrowing may make pouchitis more likely to occur. The narrowing may also make it hard to empty the pouch completely, which can lead to incontinence. Stricture formation can be caused by a small leak at the anastomosis, poor blood flow to the anastomosis, or genetic factors that cause the patient to heal in a certain way. Some of the worst strictures, especially those that occur many times or are very dense, may be associated with Crohn’s disease and be mistaken for ulcerative colitis.
Treatment for anastomotic stricture includes dilation to expand the opening (this may need to be done under anesthesia in the operating room), and inspection of the pouch. At home, you will use an anal dilator 2 times a day for 3 to 6 months until scar tissue stops forming. This will help prevent more strictures.

Pouch-anal anastomotic stricture formation occurs in 5% to 10% of patients (5 to 10 out of 100).

**Late Small Bowel Obstruction**

Because the colon is removed in all IPAA surgeries, all the surgical options described in this handout create a 16% (16 out of 100 patients) risk of small bowel obstruction over a patient’s lifetime. Symptoms of bowel obstruction may include nausea, vomiting, abdominal distension, crampy abdominal pain, and decreased bowel function (both gas and stool).

If you have any of these symptoms, call your doctor right away. Many times, early, aggressive treatment with IVs, resting the bowel by stopping all eating and drinking, and using an NG tube to suck out the stomach contents, clears the obstruction in 50% (half) of the patients. The other 50% often need surgery to repair the obstruction. And, obstruction can occur again.

**Impotence**

*Impotence* is a man’s inability to have an erection during sexual activity. It can occur for a number of medical or psychological reasons.

The nerves that control erection run close to the surgical site for this operation. These nerves are often hard to see, especially if the patient has had surgery in the area before, or if he has a major inflammation. As a result, these nerves may be stretched, injured by a cautery apparatus (surgical tools that use heat), or cut during surgery. The risk of impotence after surgery to remove the colon and rectum, regardless of whether a pouch or ileostomy is used for later reconstruction, is about 1% to 5% (1 to 5 out of 100).

**Hernia Formation**

In some patients, especially those who need more than 1 operation or who are taking high doses of steroid medicine at the time of their first operation, thinning and tearing of the abdominal wall may occur. This can lead to a hernia, even years after the operation. Symptoms are a lump, mass, or sore area, especially after heavy physical activity. Usually, the lump pushes out when the patient strains or stands and then goes back into the abdomen when the patient relaxes and lies down. This type of hernia occurs under the midline or ileostomy (if present)
incisions. These hernias are rare (under 5%, or 5 out of 100 patients), but when they occur, another operation may be needed. Laparoscopic surgery techniques may shorten the recovery time after surgery for this type of hernia. Laparoscopic surgery is done through small incisions and uses smaller instruments than open surgery.

**Medical Terms**

**Adenoma:** a benign tumor, or polyp.

**Anastomosis:** a connection made by surgery between 2 hollow organs, such as 2 ends of bowel or 2 ends of a blood vessel.

**Anorectal manometry:** a test that measures the pressure of the anal sphincter muscle, the sensation in the rectum, and the neural reflexes that are needed for normal bowel movements.

**Aspiration pneumonia:** a lung inflammation caused by fluid build-up in the lungs.

**Cardiac arrhythmia:** an abnormal heartbeat.

**Continency:** the ability to control your bowels.

**Continent ileostomy:** an ileostomy that does not require you to wear a bag outside your body. Also called a Koch or Barnett pouch.

**Crohn’s disease:** a chronic inflammatory disease that mostly involves the small and large intestine, but which can also affect other parts of the digestive system.

**Deep vein thrombosis (DVT):** a blood clot (thrombus) in a deep vein in the thigh or leg.

**Desmoid:** a tumor that grows in connective tissue, the cells involved in the formation of muscle, fibrous, and nerve tissue.

**Duodenum:** first section of the small intestine.

**Endoscope:** a narrow tube with a camera on the end that allows your doctor to see inside your body without surgery.

**Familial polyposis (also called adenomatous polyposis coli or APC):** an inherited condition in which several hundred polyps develop in the colon and rectum.

**Hernia:** a protrusion of a tissue, structure, or part of an organ through the muscle tissue of the membrane that usually contains it.

**Ileostomy:** an end or loop of ileum that is brought outside the body through an incision in the abdominal wall.
Questions?

Weekdays from 8 a.m. to 4 p.m., call the Surgical Specialties Nurse Advice Line at 206-598-4549.

After hours and on weekends and holidays, call 206-598-6190 and ask for the Resident on call for Surgery to be paged.

Or, ask for your attending surgeon to be paged: Dr. ____________

**Ileum:** part of the small bowel.

**Impotence:** a man’s inability to have an erection during sexual activity.

**Kegel exercises:** exercises to help strengthen the anal sphincter muscles.

**Mesentery:** the tissue that attaches organs to the body wall. Small bowel mesentery anchors the small intestine to the back of the abdominal wall.

**Myocardial infarction:** a heart attack.

**Peritonitis:** inflammation of the peritoneum, the layer of cells lining the inner wall of the abdomen and pelvis.

**Pouch-anal anastomotic stricture:** a narrowing of the anastomosis between the pouch and the inside of the anus. This narrowing may make pouchitis more likely to occur.

**Pouchitis:** an inflammation in the pouch that causes the same symptoms as ulcerative colitis.

**Proctocolectomy:** a surgery in which the large intestine and rectum are removed.

**Pulmonary emboli:** blood clots that break off from the legs and go to the lungs.

**Stoma:** an opening into your body from the outside created by a surgeon.

**Ulcerative colitis:** an inflammation of the large intestine (colon), one type of **inflammatory bowel disease.**

**Ureters:** tubes that carry urine from the kidneys to the bladder.