Rectal cancer surgery is generally more challenging than colon surgery, because the rectum is confined in the pelvis, making access more difficult. Experience and expertise in rectal surgery is the main difference between a colorectal surgeon and a general surgeon.

There is good evidence that performing rectal surgery frequently leads to better results for the patient in the long run, both in terms of immediate post-operative outcome and long term cancer results.

**Pre-operative assessment**

Before a rectal cancer operation can proceed, there needs to be a thorough assessment of both the lesion itself, and the patient overall. The cancer assessment is described in more detail in the paper “Bowel Cancer”, but will include the following;

**Colonoscopy and biopsy**

To get the diagnosis, assess the tumour and establish whether there are any other problems in the colon that may change the surgical strategy. Many surgeons will also perform a rigid sigmoidoscopy with a straight telescope to confirm exactly how far above the anal verge the lower edge of the cancer is situated. This latter measurement is the most important factor in determining whether the bowel can be joined back together again when the cancer has been removed.

**Computed Tomography (CT) scan of chest, abdomen and pelvis**

To check for secondary spread of the cancer to other organs, especially the liver and lungs.

**Magnetic Resonance Imaging (MRI) scan of pelvis**

To accurately assess how far through the rectal wall the cancer has invaded and whether there are any enlarged lymph nodes. The MRI scan result will determine whether pre-operative radiotherapy and chemotherapy will be recommended.

**Blood tests**

Several blood tests will need to be performed, mainly to confirm that it is safe to proceed to major surgery. These will include, but may not be restricted to, the following;

- Complete Blood Picture (CBP) – Checks the level of red blood cells, white blood cells and platelets
- Electrolytes – Checks the levels of the important salts in the body, especially sodium, potassium and chloride
- Kidney Function Tests
- Liver Function Tests
- Group and Save – Tests for blood type so that blood can be prepared for transfusion if required during or after surgery. Blood transfusion is quite rare with bowel surgery unless the patient is anaemic (low red blood cell count) when the diagnosis of bowel cancer is made.

As well as the above standard tests, surgeons often test for a bowel cancer marker called “carcinoembryonic antigen” or CEA. This blood test is often used to make sure that a cancer has not come back in the years after surgery. The initial CEA level will act as a baseline.

**Assessment by anaesthetist**

This will often occur on the day of surgery, but if there are pre-existing medical problems, a separate consultation with your anaesthetist will be organised.
Assessment by other specialists

If there are significant other medical problems and you are under the care of a specialist for them (e.g., cardiologist), it is often appropriate to see this specialist before such major surgery. This enables the specialist that knows you best to advise on how to prepare you for surgery and to be involved in your post-operative care.

Preparation for surgery

The main preparation is the bowel preparation, which for rectal surgery is the same as it was for colonoscopy in most instances. This is described elsewhere in the website and will be discussed with you by your surgeon and the nurse at Colorectal Surgery.

You will also need to fast for several hours so that your stomach is empty prior to anaesthesia. You will be told the time to commence fasting a few days before the surgery. The exact time will be determined by the estimated time that your operation is likely to commence.

Many patients take medications that need to be modified prior to surgery and the plan for each medication will be discussed with you before your operation. The main medications of concern are blood thinners, as these may lead to bleeding before and after surgery. Blood thinners include warfarin, aspirin, clopidogrel (Plavix, Co-Plavix or Iscover) and Pradaxa. Exactly how the blood thinners are managed will depend on the reason that the patient is taking them and the opinion of the specialist or GP who is managing the medication. It is very important to be aware that some ‘over the counter’ medication, particularly Fish Oil, Krill Oil and Glucosamine can also thin the blood and lead to bleeding in surgery. All of these tablets must be stopped at least 10 days before your operation.

Other medications that may need to be modified include medication for diabetes and iron tablets. As for the remainder of your medications, it is usually best to continue to take them, even with a sip of water if you are fasting. This is particularly the case for blood pressure medications, which your body needs a steady dose of so that your blood pressure is stable during the surgery.

The operation

The principle of rectal cancer surgery is to remove the cancer, some healthy bowel on either side of the cancer and the draining lymph nodes. The draining lymph nodes are situated in the fatty tissue behind the rectum and along the artery that supplies blood to the rectum. These tissues also need to be removed for a safe cancer procedure.

If possible the bowel can then be joined up again. There needs to be at least 1cm below the tumour for the bowel to be joined back together.

There are two broad groups of procedures utilised to remove the rectum, those in which the bowel is re-joined (anterior resection – image on left - 4a) and those in which the tumour is too low and the anus and anal muscles need to be removed to safely and completely remove the cancer (Abdomino Perineal Resection – image on right - 4b).
Anterior Resection

An anterior resection can be high (bowel join above 10 cm from anal verge), low (bowel join between 6 and 10 cm from anal verge) or ultralow (bowel join less than 6 cm from anal verge). The lower end of the rectum below the tumour of the rectum is stapled closed. After the bowel is removed, the upper end of the bowel is joined to the staple line using a second circular stapler.

With a very low join the colon may be turned into a colonic J pouch before the join is made. A colonic J pouch provides better bowel function for the first 2 years after surgery.

A low or ultralow rectal join, whether or not a colonic J pouch is created, is one of the riskiest bowel joins and has the highest leak rate. This is particularly the case if preoperative radiotherapy has been given. To avoid the peritonitis that would occur if the bowel join did not heal properly, most surgeons will ‘protect’ the join by bringing a loop ileostomy onto the skin on the right side of the abdominal wall. This means that small bowel fluid goes out of the body into a bag and the join in the pelvis is allowed to heal without any faeces going past. A loop ileostomy will usually stay in place for about 3 months before being re-joined in a second, smaller operation. Prior to this second operation the patient will have an X-ray (called a gastrograffin enema) to check that the rectal join is healthy.

Abdominoperineal resection

Every effort is made to remove the cancer in such a way that the bowel can be re-joined. If the tumour is too close to the anus, however, the anus needs to be removed to properly deal with the cancer. The abdominal component of the procedure is similar to an anterior resection. Instead of stapling below the tumour, a second surgeon will make a cut around the anal muscles and extend this upwards to meet the first surgeon who is operating.
from above. The top end of the bowel is divided and the tumour, rectum and anus are removed through the anal incision. The top end of the bowel is then brought out onto the left side of the abdominal skin as a permanent colostomy. The anal and abdominal wounds are then closed.

**After surgery**

After the operation the patient will be sent to a recovery area, where specially trained nurses will help with recovery from the anaesthetic and achieve adequate pain control. They will constantly check vital signs. Most patients spend between 1 and 2 hours in recovery after major bowel surgery.

There will be a number of tubes and attachments. Almost all patients will have the following:

- A plastic cannula in the arm (intravenous or IV line) – to give IV fluids whilst fasting and for IV medications such as pain killers and drugs to control nausea.

- A tube in the bladder (indwelling catheter or IDC) – To allow a patient to stay in bed for the first few hours and to monitor how much urine is produced. Urine output is the most accurate way of monitoring a patient’s level of hydration.

- A heart monitor (electrocardiogram or ECG) – to monitor heart rate and rhythm. This may come off when on arrival in the ward if everything is stable.

- A blood pressure monitor - This may also come off on the ward if there are no concerns in recovery

- An oxygen saturation clip – This clip sits on the finger and measures the level of oxygen in red blood cells.

- An oxygen mask – to give increased levels of oxygen to the lungs whilst the patient wakes up from anaesthesia.

On occasions there will need to be extra tubes or attachments, such as;

- A drain or drains – A tube attached to a suction device that will take any fluids away from the operation site. This is most commonly used in rectal surgery as fluid is prone to collect in the pelvis and may get infected if not removed.

- A nasogastric tube (NGT) – A tube that sits in the nose, but runs down the back of the throat into the stomach, from where it drains stomach fluid.

- An arterial line – a more complicated and invasive monitoring device inserted into an artery in the wrist.

- A central venous line – a long plastic cannula inserted in the neck to more closely monitor hydration levels in less stable patients.