

Improving life for
people affected
by inflammatory
bowel diseases



Investigations for IBD



Crohn's and Colitis UK is the working name for the National Association for Colitis and Crohn's Disease (NACC). NACC is a voluntary Association, established in 1979, which has over 30,000 members and 70 Groups throughout the United Kingdom.

Membership of the Association costs £12 a year. New members who are on lower incomes due to their health or employment circumstances may join at a lower rate. Additional donations to help our work are always welcomed.

Crohn's and Colitis UK's publications are research based and produced in consultation with patients, medical advisers and other health or associated professionals. They are prepared as general information on a subject with suggestions on how to manage particular situations, but they are not intended to replace specific advice from your own doctor or any other professional. Crohn's and Colitis UK does not endorse or recommend any products mentioned.

We hope that you find the information helpful and relevant. We welcome any comments from readers, or suggestions for improvements. References or details of the research on which this publication is based can be obtained from Crohn's and Colitis UK at the address below. Please send your comments to Helen Terry at Crohn's and Colitis UK, 4 Beaumont House, Sutton Road, St Albans, Herts AL1 5HH, or email h.terry@crohnsandcolitis.org.uk

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Introduction

If you have, or are thought to have, Ulcerative Colitis (UC) or Crohn's Disease, (collectively known as Inflammatory Bowel Disease or IBD), your doctors will probably ask you to have certain medical tests or investigations. The results from such tests can help ensure that you are given the correct diagnosis and that your treatment is based on good quality information. As both UC and Crohn's Disease are ongoing conditions, the tests may need to be repeated from time to time, or you may be asked to have a different test or investigation.

This booklet is intended to be a brief guide to the main types of tests or investigations most commonly suggested for people with IBD. Your doctor or IBD team should be able to give you more detailed information. You may also find some of our other publications helpful. A full list is available from our information service (0845 130 2233) and our website: www.crohnsandcolitis.org.uk. Many of our publications can also be downloaded from the site.

Blood Tests

There are several blood tests which are used to help establish a diagnosis or to monitor the effects of IBD or its treatment. Once the disease is in remission, such tests may not be needed so regularly. During a flare up however, or when drug treatment has been prescribed, blood tests can be required quite frequently.

Blood samples are usually taken from a vein in the arm using a needle attached to a syringe or to a series of small vacuum tubes. For some specialised tests you may be asked to fast (avoid eating) overnight or for a few hours before the sample is taken. In this case you will be given specific instructions from the laboratory or the doctor who arranges the test.

Full Blood Count (FBC)

This is probably the most common blood test done in IBD. It counts and measures the levels of the three main types of blood cells (red cells, white cells, and platelets). The white cell count can indicate inflammation or infection. An increase in the number of platelets (small cells necessary for blood clotting) can also be a sign of inflammation. By measuring the level of haemoglobin (a molecule in the red blood cells that helps carry oxygen through the body) an FBC test can help detect anaemia. Some drugs commonly given for IBD, such as azathioprine and 6-mercaptopurine, can affect the bone marrow and reduce the levels of red cells, white cells and/or platelets. People on these drugs are usually given regular FBC tests to help monitor their blood cell levels.

Erythrocyte Sedimentation Rate (ESR)

This is a very simple measure of how quickly the red blood cells settle in a tube. This usually happens slowly: a faster than usual ESR can indicate active inflammation.

C-reactive Protein (CRP)

The blood levels of this protein increase very quickly when inflammation or infection is present, so a CRP test is often used to monitor the activity of IBD.

Ferritin

Ferritin is another protein found in blood plasma which tends to increase with inflammation. It also reflects the body's iron stores and a low level may suggest that iron supplements are needed.

Liver Function Tests (LFTs)

These tests measure a group of enzymes which give information about how well the liver is working. Some of the drugs given for IBD, for example azathioprine, methotrexate, and some 5-ASA drugs, can affect the liver and LFTs are a useful way to check this. LFTs usually include a

test of serum albumin levels as low levels of this protein can be another sign of inflammation or poor absorption of nutrients. Liver function tests can also help diagnose rare complications of IBD, such as sclerosing cholangitis.

Urea and Electrolytes (U&E)

U&E tests measure the levels of urea, creatinine and electrolytes (dissolved salts such as sodium and potassium) in the blood, and are usually carried out to check kidney function. They can also be helpful in assessing hydration levels and may be used to monitor the effects of nutritional treatment, or changes in blood salt levels caused by acute diarrhoea. Like full blood counts and LFTs, regular U&E tests are often recommended for people on IBD drug treatments.

Bone Chemistry

Blood tests may include a check on levels of calcium, phosphate, and an enzyme called alkaline phosphatase, which can be a sign of potential bone problems. Because vitamin D is involved in calcium absorption, vitamin D levels may also be checked if bone loss is suspected. However, these blood tests are not the best way of detecting osteoporosis (bone thinning), as this may exist despite completely normal blood bone chemistry. The preferred test for osteoporosis is a bone densitometry or DEXA scan. (See page 14.)

Magnesium

Magnesium levels are usually tested along with potassium and calcium. Severe diarrhoea can cause low magnesium levels, and this in turn may lead to muscle weakness.

Trace Elements

These include zinc, selenium, chromium and other minerals which are usually found in tiny quantities in the blood of healthy people. They are most likely to be checked if you are on intravenous feeding or long term nutritional treatment.

Vitamin B12 and Folic Acid

These vitamins are necessary for the formation of healthy blood cells and for many other body functions. Low folic acid levels can indicate poor nutrition or poor absorption of food from the small intestine. Methotrexate, a drug sometimes given for IBD, can also affect folic acid levels. Vitamin B12 is absorbed into the blood stream only from the terminal ileum (the last part of the small intestine before it joins the colon). Severe Crohn's in this area or removal of the terminal ileum through surgery can lead to a lack of vitamin B12, often treatable with B12 injections.

Antibody Tests: pANCA and ASCA

Sometimes it is difficult to make a clear diagnosis between Ulcerative Colitis and Crohn's Disease, in which case you may be said to have Indeterminate Colitis or IBD Unclassified (IBDU). Some centres now use these new antibody blood tests to help determine which condition is more likely and to improve decisions about treatment. Generally, people with Ulcerative Colitis tend to have the perinuclear anti-neutrophil (pANCA) antibody in their blood, while people with Crohn's have the anti-Saccharomyces cerevisiae (ASCA) antibody, although this is not always the case.

Stool Tests

Fresh stool samples can be examined to check whether a flare up of IBD type symptoms is due to an infection. In this case you may need antibiotic treatment.

Faecal Calprotectin and Lactoferrin Tests

Increased levels of the proteins calprotectin or lactoferrin in stools can be a sign of active inflammation. These tests are now becoming more widely used, but are not yet available in all centres.

Endoscopy

Endoscopy is a general term for the examination of the inside of the body using an endoscope. There are different types of endoscope according to which part of the body is being examined, but in general an endoscope is a thin, usually flexible, tube with a light at its tip, and often a tiny camera as well, linked to a video system. The endoscope is inserted either through the mouth or the anus (back passage). It allows the doctor or specialist endoscopist to get a clear look at the internal lining of the relevant part and to take a biopsy (a small scraping of tissue). The biopsy can then be examined under a microscope to find out the severity and type of any inflammation. Biopsies can also sometimes show if there is any infection present.

Some examinations are done in the outpatient clinic, but most are now carried out in a specialised endoscopy unit. You may need to fast for a while and take a special bowel preparation before your endoscopy. The clinic or unit will send you written instructions about this.

A sedative and pain-reducing injection is commonly given for some types of endoscopy, particularly colonoscopy (endoscopy of the colon or large intestine). This is partly to help you to relax and partly to reduce discomfort. For some of the simpler endoscopies sedatives are no longer routinely given. If you are particularly nervous about the procedure you can discuss this with the staff at the endoscopy unit or clinic. If you do have sedation you will need someone to take you home after the endoscopy, and you will not be allowed to drive for 24 hours.

The main types of endoscopy carried out for IBD are as follows:

Proctoscopy

This is a quick examination of the rectum and is usually done in an outpatient clinic, with very little discomfort. A proctoscope (the type of endoscope used for a proctoscopy) is a small metal or plastic tube which is inserted into the anus. It allows limited views of the rectum but is a useful way of checking the anal canal for fissures, fistulas and haemorrhoids.

Sigmoidoscopy

A sigmoidoscopy is an examination of the lower part of the colon. The type of endoscope used for this, a sigmoidoscope, can be either rigid or flexible. Rigid sigmoidoscopy is similar to proctoscopy, but using a slightly longer endoscope.

Flexible sigmoidoscopies are generally carried out in a specialist endoscopy unit. A flexible sigmoidoscope is a 35 to 60 cm long tube about the thickness of an index finger. This is inserted through the rectum and used to examine the colon up to the splenic flexure (that is, the left side of the colon only). If you are to have a flexible sigmoidoscopy you will probably be asked to use an enema to empty the bowel before you come to the clinic, or given a laxative when you arrive. The examination itself takes about five to ten minutes, and is usually done without sedation. Because air is used to expand the colon you may feel some discomfort, but this should pass once the examination is finished. A flexible sigmoidoscopy is most useful for UC or Crohn's limited to the left side of the large intestine.

Colonoscopy

A colonoscope is a thin flexible tube (again about the thickness of a finger), which is long enough to examine the whole colon (large intestine) and sometimes also the terminal ileum (the lower end of small intestine). The colon has to be absolutely clean for this examination, so you will need to take special laxatives and a lot of fluids the day before the investigation. You may also need to stop taking certain medications for a few days. The endoscopy unit

staff will provide you with detailed instructions on how to prepare for the test and should be happy to help with any queries you may have. The colonoscopy itself takes about half an hour, but is usually performed under sedation, so you will have to allow extra time for the sedation to work and then to wear off. The sedation should make you sleepy and relaxed but is not a general anaesthetic. People's experiences of a colonoscopy vary: usually it does not hurt, but some people find it uncomfortable.

Colonoscopies are often used to assess both the extent and severity of UC and Crohn's in the colon. Regular or 'surveillance' colonoscopies may be recommended to check for dysplasia (abnormal cell changes) in people with longstanding UC or extensive Crohn's Disease. (For more information see our information sheet, *Bowel Cancer and IBD*.)

Gastroscopy

A gastroscopy or 'upper GI endoscopy' allows the endoscopist to examine the top part of the digestive system, that is, the oesophagus (gullet), stomach and duodenum (the first part of the small intestine). The instrument used to do this, the gastroscope, is the slimmest of the flexible endoscopes, and thinner than even a little finger. To allow a clear view, your stomach must be empty and you will be asked not to eat or drink for at least 6 hours before the test. Some doctors may spray a local anaesthetic on the back of your throat or give you a tablet to suck to numb the area. You may also be offered a sedative injection, although many centres have found that most people do not need this, as gastroscopes have become much smaller and so easier to swallow. The investigation usually takes about 10 to 15 minutes, and is used only for Crohn's Disease, not UC.

Double Balloon Enteroscopy (DBE)

A double balloon enteroscope is a special type of endoscope, about the thickness of a pencil, with two small balloons at the tip, which help it reach much further into the small intestine than other endoscopes. It is usually passed through the mouth, but may be put in through the anus, like a colonoscope. It can be used to look at and take biopsies from the whole length of the small intestine. You will usually be given a sedative for a DBE.

Capsule Endoscopy

For a capsule endoscopy you will be asked to swallow a capsule about the size of a small grape, which contains a tiny camera, light source and transmitter. As the camera moves through the digestive system it takes a series of photographs and sends these to a small data recorder worn on a belt around the waist. You will need to fast overnight for this investigation, but once you have swallowed the capsule you should be able to drink fluids after 2 hours and, after about 4 hours, eat a light snack. The whole test takes about 8 hours, after which time the belt is taken off and the information from the recorder is put onto the unit computer. The capsule is disposable and will be excreted naturally in a bowel movement. Not all centres offer capsule endoscopy and it may not be suitable for everyone, for example people with a stricture (narrowing of the intestine). Also, biopsies cannot be taken with a capsule endoscopy.

Plain X-Rays

Abdominal and Chest X-rays

Some ordinary or plain x-rays can be helpful in the management of IBD. For example, abdominal and chest x-rays will show the pattern of gas in the intestine which can give useful information about the extent and severity of UC or Crohn's. You may also be given an abdominal x-ray if there is a concern that you have a bowel obstruction.

Joint X-rays

Some people with IBD develop arthritis and swollen joints. An x-ray of the sore joints may give more information. If you have backache, x-rays of your spine, sacro-iliac joints, pelvis or hips may be taken to look for signs of joint inflammation. Alternatively, you may be given an ultrasound or MRI scan (see below).

Barium X-rays

Because the gut does not always show up very clearly on ordinary x-rays, you may be given, as a drink or as an enema, an opaque white liquid containing barium sulphate. Barium sulphate is a harmless white powder that is not absorbed by the body, but can form a temporary coating on the inside of the gut, as it moves through your system. X-rays cannot pass through barium, so this gives a clearer outline of the gut or intestine in the x-ray pictures. The main types of barium x-ray used in IBD are described below.

Barium Meal

This is the x-ray equivalent of gastroscopy. You will be asked to swallow a barium drink which will outline the oesophagus, stomach and duodenum. You may also be given a fizzy drink to help expand your stomach and give additional detail on the x-ray image.

Barium Follow-Through

A barium meal and follow through test allows the doctor or radiologist to examine the small intestine as well as the upper part of the digestive tract. You will probably be asked to take a laxative the day before this test, and then fast overnight. Once you have swallowed the barium drink a series of x-ray pictures are taken, following the path of the barium as it passes through your system. As the speed at which this happens can vary, the overall investigation may take several hours.

Small Bowel Barium Enema

Although this test is called an enema, it uses a fine tube inserted through the nose or mouth into the stomach and duodenum (the top of the small intestine). This helps the barium liquid flow directly into the small intestine. As with a barium meal test you may be asked to take laxatives and fast overnight before this test. Sometimes a local anaesthetic throat spray is used to make swallowing the tube more comfortable. Once the barium is in the intestine a series of x-ray pictures can be taken. This test is particularly useful if there is a concern about strictures, or if it has been difficult to obtain good pictures of the small intestine during a barium follow-through.

Barium Enema

A large bowel barium enema allows the doctor or radiologist to get a better image of the colon (large intestine) and is the x-ray equivalent of colonoscopy. For this test the colon has to be completely clean, and you will need to take special laxatives and lots of fluids the day before the investigation. A barium enema usually takes about 15 to 30 minutes. A soft plastic tube is put into the rectum and liquid barium is passed through this into the colon. You may be given an injection to help relax the colon, either at the beginning or during the test. Air may also be pumped through the tube to expand the colon and get a clearer picture. As the series of x-ray pictures are taken you may be asked to move into different positions to help the flow of liquid. A barium enema should not be painful, but may be uncomfortable, especially if air is used.

After a barium enema your faeces (stools) will turn pale and chalky looking, and be difficult to flush away for a day or two. This is the barium passing out of your system. Taking a gentle laxative each day until you have passed the barium is sometimes helpful.

Other X-ray Tests and Scans

CT Scans (Computerised Tomography)

A CT scanner is a special type of x-ray machine which uses a series of x-ray beams to build up a more detailed picture of the body. The scanner looks like a huge ring doughnut, and you lie on a moving table which slides slowly through its centre. X-rays are taken from different angles and are displayed on the monitor as 2 dimensional cross-sections, or 'slices'. These are then put together to give a 3D picture of the part of the body being examined. Sometimes dyes are used to help tissues show up more clearly. For IBD related scans you may be given an injection of a contrast (dye) through a drip, or asked to swallow barium liquid, or be given a barium enema, as for a traditional barium x-ray. CT scans usually take between 20 and 45 minutes, depending on the number of angles and pictures needed. A CT scan of the colon (large intestine) is sometimes described as a CT colonograph, and may also be called a 'virtual colonoscopy'. In IBD, CT scans are most commonly used to assess the extent of inflammation and to look for complications such as abscesses or strictures.

MRI Scan (Magnetic Resonance Imaging)

MRI scanning is an alternative way of producing cross-sectional pictures similar to CT scans. Instead of x-rays, MRI machines use powerful magnets and radio waves to create images of the inside of the body. The scanner is shaped like a tunnel or large tube, and you will be asked to lie on a moveable table which slides slowly through this tunnel. MRI scanning is noisy and you will probably be given earplugs, or perhaps music to listen to. It is important that you stay as still as possible during the scan, to avoid blurring the pictures. You may also be given an injection of a contrast agent (dye) to make the detail clearer. MRI scans are painless, but, because the scanning process can take from 30 minutes to over

an hour, some people may find it uncomfortable, especially if they are claustrophobic (anxious about enclosed spaces). MRI scanning has the advantage of avoiding x-rays however, and is a good way of looking at soft tissue, such as muscles and ligaments, as well as solid organs like the liver. MRI scans are increasingly used for people with Crohn's Disease. MRI is particularly effective in detecting fistulas around the anus and in distinguishing between active inflammation and scarring. Because it uses magnets, MRI is not suitable for people with a pacemaker or some types of metal implants.

Ultrasound

Ultrasound scanners use very high frequency sound waves to create an image. A handheld sensor is moved over the surface of the skin, and this sends out sound wave signals which 'bounce off' internal organs as an echo. The ultrasound machine picks up the echoes and converts them to a picture which is displayed on a TV-like monitor. Ultrasound is completely painless and is often used with pregnant women to track the growth of their unborn baby. It can also help diagnose heart, liver and kidney problems. In IBD, ultrasound is used to look at masses in the abdomen. It can help detect collections of fluids and thickened and inflamed parts of the wall of the intestine. It may also show up fistulas and abscesses, as often found with Crohn's Disease.

PET Scans

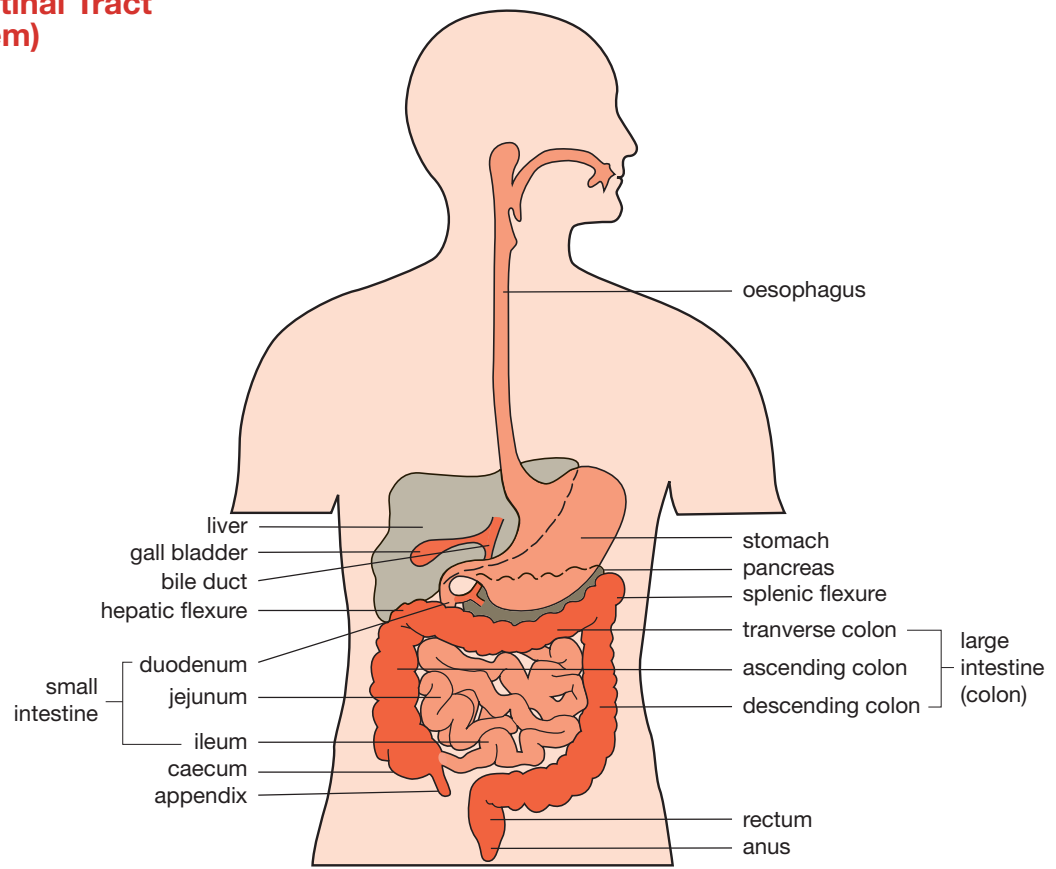
Recent studies have suggested that PET (positron emission topography) scans may also be useful in the diagnosis of IBD. For this type of scan a very small amount of a radioactive marker chemical is attached to a naturally occurring chemical, such as glucose, and this is injected into the bloodstream. As it breaks down this gives off energy in the form of positrons (positively charged particles), and a computer attached to the scanner translates these signals into 3D images. The PET scanning machine is similar to a CT scanner.

Bone Density (DEXA) Scans

DEXA (dual energy x-ray absorptiometry) scanners use low dose x-rays to measure bone mineral density, particularly in the lumbar (lower) spine and in the upper end of the femur (thigh bone). This is a painless test which takes about 20 minutes. It shows whether bone density is normal, or reduced to a level where fractures are more likely – the condition known as osteoporosis. If you have IBD you are more at risk of developing osteoporosis, especially if you have been on steroids or have low calcium levels. (For more details, see our information sheet, *The Bones and IBD*.)

If you have any further queries please call our information line on 0845 130 2233, email info@crohnsandcolitis.org.uk or see our website: www.crohnsandcolitis.org.uk

The Gastrointestinal Tract (Digestive System)



Other Useful Organisations

Bladder and Bowel Foundation (B&BF) www.bladderandbowelfoundation.org	0845 345 0165
Colostomy Association www.colostomyassociation.org.uk	0800 328 4257
Core – Fighting Gut and Liver Disease www.corecharity.org.uk	020 7486 0341
Crohn's in Childhood Research Association (CICRA) www.cicra.org	020 8949 6209
ia – The Ileostomy and Internal Pouch Support Group www.iasupprt.org	0800 018 4724
Macmillan Cancer Support (Including Cancer Backup) www.macmillan.org.uk	0808 808 0000
National Osteoporosis Society www.nos.org.uk	0845 450 0230
Ostomy Lifestyle www.ostomylifestyle.org.uk	0800 731 4264

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