



INFORMATION SHEET

TESTS AND INVESTIGATIONS FOR IBD

INTRODUCTION

This information sheet looks at some of the medical tests and investigations you may be offered if your doctor suspects you have Ulcerative Colitis (UC) or Crohn's Disease (the two main forms of Inflammatory Bowel Disease - IBD). The results from these tests can help ensure that you are given a correct diagnosis, and that your treatment is based on good quality information.

As hospital procedures will vary, this leaflet can only be a general guide to the tests and investigations it covers. For more detailed information about the tests you are being asked to have, talk to your doctor or specialist IBD team. They should be happy to help with any queries or concerns. You may also find that the hospital or clinic has its own information sheets about specific tests and procedures. You could also contact our Crohn's and Colitis UK Information Line or visit our website for further help. (Our contact details are given at the end of this leaflet).

WHICH TESTS WILL I NEED?

You will probably only need to have a few of the tests listed in this information sheet. However, IBD is an ongoing condition, so some of the tests may need to be repeated from time to time, or extra tests may be needed.

BLOOD TESTS

There are several blood tests which are used to help support a diagnosis of IBD, or to monitor the effects of IBD or its treatment.

Blood samples are usually taken from a vein in the arm, using a needle attached to a syringe or to a collecting container. For some specialised tests you may be asked to fast (avoid eating) overnight or for a few hours before the sample is taken. Your doctor or nurse will let you know if this is necessary.

Some of the blood tests used most often in IBD are described below:

- **Full Blood Count (FBC)**

An FBC counts and measures the levels of the three main types of blood cells (red cells, white cells, and platelets). The number of white blood cells can indicate if there is any inflammation or infection in the body. An increase in the number of platelets (small cells involved in blood clotting) can also be a sign of inflammation. By measuring the level of haemoglobin (a molecule in red blood cells which carries oxygen through the body), an FBC test can detect anaemia – for more information see **Ferritin and Transferrin Tests** below.

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Fortunately my son has always coped with the blood tests quite well. The tests have become a normal routine part of his life now.

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Bev, mother to Ben, age 18
diagnosed with Ulcerative Colitis in 2007

TESTS AND INVESTIGATIONS FOR IBD

Some of the drugs given for IBD, such as azathioprine and mercaptopurine, can affect the bone marrow and reduce the levels of red and white blood cells and platelets. People on these drugs are usually given regular FBC tests to help monitor their blood cell levels.

- **Inflammatory Marker Tests**

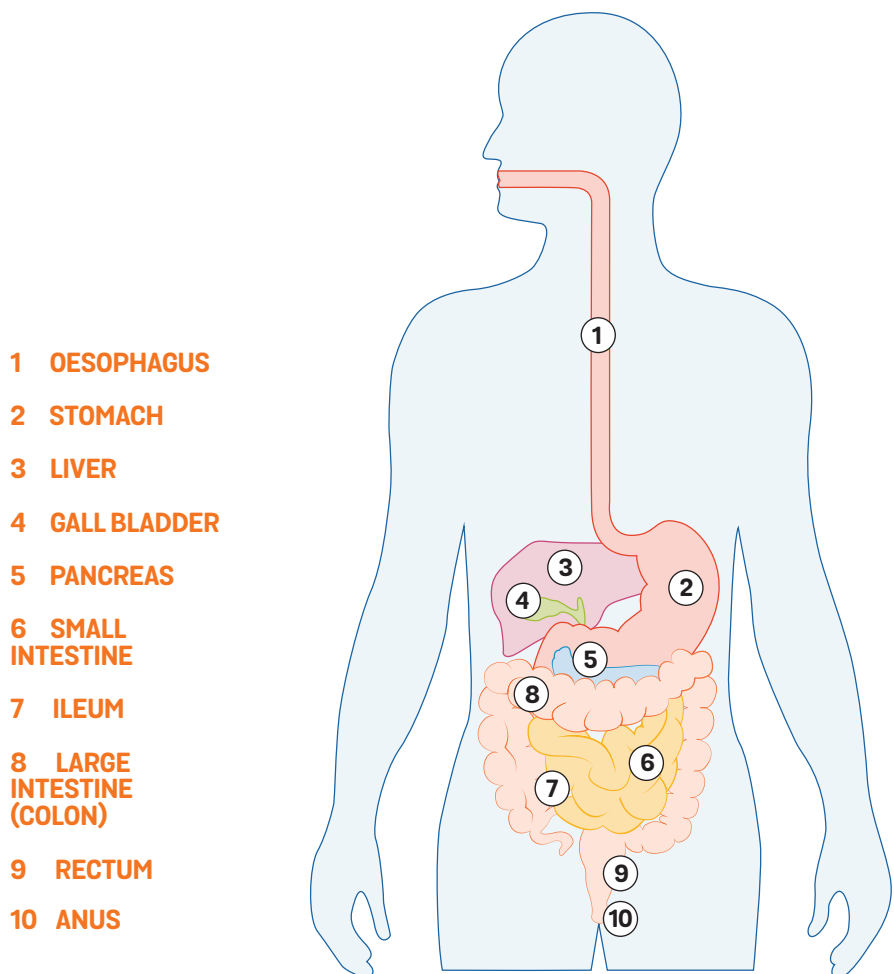
Inflammation can increase the levels of some types of proteins found in the blood. Blood tests such as C-Reactive Protein (CRP) and Erythrocyte Sedimentation Rate (ESR) can be used to detect inflammation by measuring the levels of these proteins or 'inflammatory markers'.

- **Liver Function Tests (LFTs)**

A liver function test or LFT can help to show whether the liver is working properly. It can also be used to help diagnose some of the rare liver complications of IBD, such as Primary Sclerosing Cholangitis.

An LFT measures the levels of a specific group of proteins and enzymes found in the blood. LFTs usually also include a test for a protein called serum albumin. Low levels of this protein can be a sign of inflammation.

Some of the drugs given for IBD, for example azathioprine, methotrexate, and some 5ASA drugs (such as mesalazine) can affect the liver. LFTs are a good way of checking for this.



- **Urea and Electrolytes (U&E)**

U&E tests measure the levels of urea, creatinine, and electrolytes (dissolved body salts such as potassium and sodium) in the blood. They are usually carried out to assess how well the kidneys are working. This test can also be used to check for dehydration (a common effect of acute diarrhoea). Regular U&E tests are often recommended for people on IBD drug treatments.

- **Ferritin and Transferrin Tests**

Iron deficiency (a lack of iron) is one of the main causes of anaemia, a common complication of IBD. Symptoms of anaemia include fatigue, headaches and shortness of breath.

An FBC or full blood count (as described earlier) is one way of detecting iron deficiency. The doctors may also check your ferritin or transferrin saturation levels.

Ferritin is a protein in the blood that tends to increase with inflammation, so can be used as an inflammatory marker. It also stores iron and a low level of ferritin is usually a good indicator of low iron levels.

Transferrin, another blood protein, binds to iron to carry it from the gut. A transferrin saturation test shows how much of the transferrin in the body is actually carrying iron. A low transferrin saturation reading is another sign of iron deficiency.

- **Vitamin B12 and Folic Acid**

Your blood may also be tested for Vitamin B12 and folic acid. These important vitamins work together to form healthy red blood cells.

Vitamin B12 is absorbed into the blood stream from the terminal ileum (the last part of the small intestine before it joins the colon). If the ileum is very inflamed or damaged, or has been removed by surgery, the body may not be able to absorb enough Vitamin B12, in which case it can be given by injection.

Low folic acid levels can be caused by poor nutrition or poor absorption from the small intestine. Some medications for IBD, such as methotrexate and sulphasalazine (a 5ASA drug), can also affect folic acid levels.

- **Other Blood Tests**

Other blood tests that may be helpful in IBD include:

- Tests for **calcium** and **phosphate**. Both these minerals are important for bone health. Vitamin D levels may also be measured if bone loss is suspected.
- A **magnesium** check. Magnesium is needed for healthy muscles and bones. Severe diarrhoea may cause low magnesium levels, so a blood test may be needed to check this.
- Tests for **trace elements**, such as zinc, selenium, chromium and other minerals which are usually found in tiny quantities in the blood of healthy people. These may be checked if you are on intravenous feeding or long-term nutritional treatment.
- A **TPMT** (thiopurine methyltransferase) test. This test can help predict who is more likely to experience side effects from thiopurine drugs such as azathioprine or mercaptopurine. However, it cannot identify everyone who may be affected.
- **Screening tests**. Before you start on certain immunosuppressant or anti-TNF drugs, such as infliximab or adalimumab, you may need to be screened for infectious diseases such as Hepatitis B or C, tuberculosis, HIV, or chicken pox.

STOOL TESTS

Fresh stool samples can be examined to check whether a flare-up of IBD-like symptoms is actually caused by an infection. This type of test is called a **stool microscopy, culture and sensitivity test**.

For example, tests may be carried out to look for infections such as Salmonella, Campylobacter, and Clostridium Difficile. If you have recently travelled abroad you may need additional tests.

Faecal calprotectin and **faecal lactoferrin** stool tests can also be used to detect an increased level of specific proteins in the stools, which can be a sign of active inflammation. Doctors are increasingly using this type of test to help with the initial diagnosis of IBD, and to monitor the disease and the progress of some treatments.

ENDOSCOPIES

Endoscopy is the general name for a type of test which allows a specialist doctor or nurse (an endoscopist) to look directly at the inside of the digestive system, using an endoscope.

There are several different types of endoscope, depending on which part of the body is being examined. But, in general, an endoscope is a long, very thin and usually flexible tube with a light and a video camera attached to the end of it. The endoscope can be inserted either through the mouth to look at the top part of the digestive system, or through the anus to look at the colon and rectum. The video camera relays images to a screen outside the body, and this allows the endoscopist to get a clear look at the part of the gut they are examining.

The endoscopist may also take a biopsy using the endoscope. This is a small scraping of cells from the lining of the gut, which can then be examined under a microscope in order to give more information.

The endoscopy staff will provide you with detailed instructions on how to prepare for your endoscopy, and should be able to answer any questions you may have.

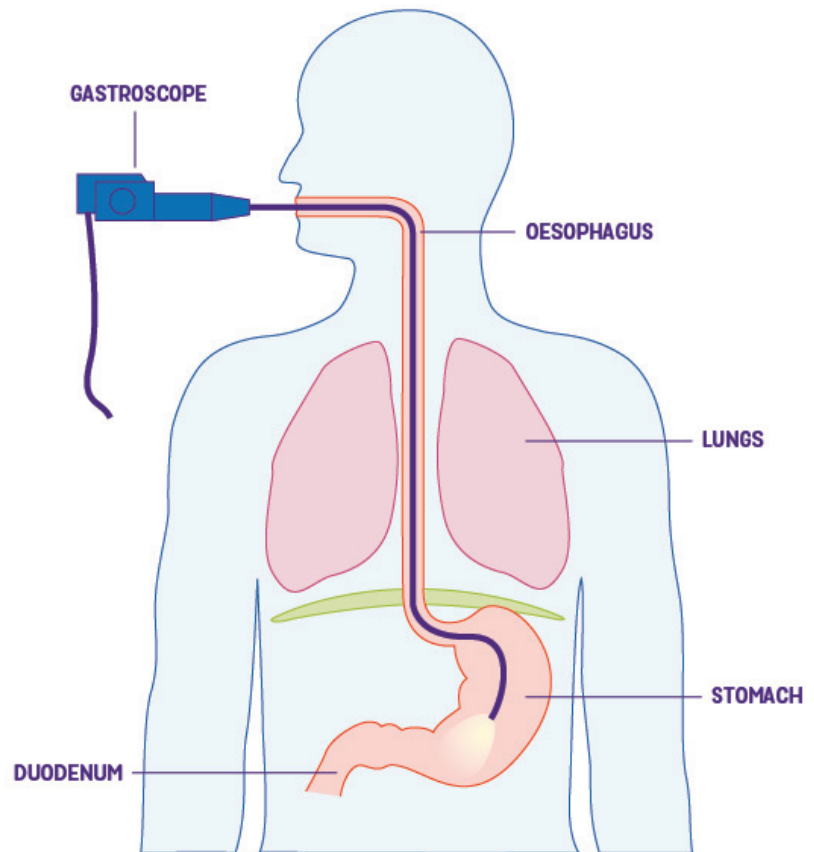
The main types of endoscopy are as follows:

- **Upper Gastrointestinal (GI) Endoscopy** (or **Gastroscopy**)

This type of endoscopy is used to investigate the top part of the digestive system – the oesophagus, stomach, and duodenum (first part of the small intestine). It tends to be used more in Crohn's than UC, but may be helpful to rule out Crohn's when diagnosing UC.

The endoscope used for this type of examination is usually known as a gastroscope. It will be gently inserted through the mouth and down the oesophagus into the stomach and the first part of the small intestine. The diagram shows the path it will take.

See the diagram on the next page.



The stomach must be empty in order to get a clear view, so you will be asked not to eat anything for at least 6 hours before the procedure. Some doctors may spray a local anaesthetic onto the back of the throat, or give you a lozenge to suck to help numb the area. You may also be offered a sedative to relax you if you need it, and children under 16 may require a general anaesthetic. If you do have sedation, you will need someone to take you home after the endoscopy, and you should not drive for 24 hours after the sedation.

- **Colonoscopy**

A colonoscopy is an endoscopy of the colon (large intestine). Colonoscopies are often used to assess the extent and severity of UC and Crohn's Colitis (Crohn's in the colon). Regular or 'surveillance' colonoscopies may also be recommended to check for dysplasia (abnormal cell changes which can be an early sign of bowel cancer) in people with longstanding and extensive UC or Crohn's. For more information about bowel cancer, see our leaflet: **Bowel Cancer and IBD**.

The endoscope used in a colonoscopy is sometimes known as a colonoscope. It is a narrow and very flexible tube, long enough to examine the whole of the colon, and, if necessary, the lower end of the small intestine as well. It is inserted through the anus. Some centres also use a special dye to make it easier to see any changes to the colon lining (this technique is called chromoendoscopy).

The colon has to be completely clean for this examination, so you may be asked to avoid certain foods and will need to drink a special laxative the day before the investigation. You may also need to stop taking some of your medications – your hospital will give you detailed instructions.

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The sedative that I had for the colonoscopy made it difficult to do much afterwards. So I made sure someone came and collected me after the test, and took me home, because I needed someone to look after me.

”

Cari, age 34
diagnosed with Crohn's Disease in 2007

“

Having my first colonoscopy was pretty daunting. But I needn't have worried, as although it was uncomfortable, it was over quickly enough.

”

Karen, age 55
diagnosed with Crohn's Disease in 1991

You may be offered sedation for your colonoscopy, to make you feel sleepy and relaxed. Children are usually given a general anaesthetic. People's experiences of colonoscopies can vary. A colonoscopy should not be painful but may be uncomfortable. If you are particularly concerned or anxious, talk through your sedation options with the staff at the endoscopy unit. As with sedation for an upper gastrointestinal endoscopy, you will need someone to take you home, and should not drive for 24 hours after the sedation.

- **Sigmoidoscopy (or Proctosigmoidoscopy)**

This is similar to a colonoscopy, but only examines the sigmoid colon (the lower part of the colon) and the rectum. The type of endoscope used for this may be either flexible or rigid. A flexible sigmoidoscope is longer than a rigid sigmoidoscope, and allows the doctor to see further up the colon.

If you have a flexible sigmoidoscopy, you will probably be asked to use an enema to empty the bowel before you go to the clinic or once you have arrived. This examination is usually done without sedation. As air is used to expand the colon you may feel some discomfort, but this should pass once the examination is finished. Sigmoidoscopy is most useful for IBD limited to the left side of the colon.

- **Proctoscopy**

A proctoscope is a very short endoscope which is used to examine the anal canal. It is a useful way of checking for internal haemorrhoids (piles), fissures (tears) and fistulas (abnormal channels linking different parts of the bowel).

- **Double Balloon Enteroscopy (DBE)**

This is an examination of the small intestine which uses a special type of endoscope with two small balloons at its tip. The balloons help the endoscope to reach further into the small intestine than other types of endoscopes. It may be inserted through the mouth, but can be put in through the anus, like a colonoscope. It can be used to examine and take biopsies from the whole length of the small intestine. You will usually be given a general anaesthetic or sedative for a DBE.

- **Capsule Endoscopy**

For this investigation you will be asked to swallow a small capsule the size of a jelly bean. The capsule contains a camera, which takes a series of photographs as it passes through the digestive system. These photos are sent to a small data recorder worn around the waist. The capsule is disposable and should pass out of the body naturally, in a bowel movement.

In very young children, the capsule may be placed in the bowel by an endoscope.

Capsule endoscopy is not available in all hospitals, and is not suitable for everyone, for example people with strictures (a narrow section of the intestine).

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X-RAYS

- **Abdominal X-rays**

Ordinary or plain abdominal x-rays cannot show as much detail of the digestive system as some of the other imaging techniques. However, they may be used in an emergency, or in the initial diagnosis of suspected severe IBD.

- **DEXA (Dual Energy X-Ray Absorptiometry) Scans**

DEXA scanners use low dose x-rays to measure bone density, usually in the spine or thigh bone. This is a painless test that takes about 20 minutes. It can show whether bone density is normal, or whether the bones have become thinner and weaker – the condition known as osteoporosis.

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People with IBD have an increased risk of developing osteoporosis, particularly if they have been on steroids, or have low calcium levels. For more details, see our information sheet, **Bones and IBD**.

- **Barium Studies**

The digestive system does not always show up well on x-rays, so you may be given barium to help produce a clearer image. This is a harmless white substance which is not absorbed into the body, but instead forms a temporary coating on the inside of the gut. X-rays cannot pass through the barium, so this gives a clearer outline of the gut in x-ray images.

The barium may be introduced into the gut in several different ways, in order to show up the different sections of the gut.

In a **barium meal test**, you will be asked to swallow an opaque white liquid containing the barium. This will give a better picture of the upper part of the digestive system - the oesophagus, stomach and duodenum. You may also be given a fizzy drink or powder to help expand your stomach in order to get additional detail on the image.

A **barium follow through test** allows the doctors 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 the test, and then to fast overnight. Once you have swallowed the barium drink, a series of x-rays are taken as the barium passes on through your system. As the speed at which this happens can vary, the overall investigation may take several hours.

During a **small bowel barium enema** (also known as a small bowel enteroclysis) a small thin tube is inserted through the nose or mouth into the stomach and duodenum. This helps the barium liquid flow directly into the small intestine. As with the follow through, you may be asked to take laxatives and fast overnight or follow a special diet the day before. An anaesthetic throat spray or numbing jelly is sometimes used to make swallowing the tube more comfortable. Once the barium is in the intestines, a series of x-ray pictures can be taken. Some air may also be pumped in to expand the small intestine and get a clearer picture.

More rarely, a **barium enema** may be used to give a clearer image of the colon. For this test, a soft plastic tube is placed in the anus, and liquid barium is passed through this into the rectum and colon. You may be given an injection to help relax the colonic muscles. Air may also be pumped in to expand the colon and get a clearer picture. A series of x-ray pictures will be taken and you may be asked to move into different positions to help the flow of the barium liquid. The enema should not be painful, but may be uncomfortable, especially if air is used.

After any of these barium studies, your faeces will turn pale and chalky looking, and may be difficult to flush away for a day or two. This is because the barium is passing out of your system.

COMMONLY USED SCANS

- **CT (Computerised Tomography) or CAT (Computerised Axial Tomography) Scans**

A CT scanner is a special machine that uses a series of x-ray beams to build up a detailed picture of the body. The scanner looks like a giant ring doughnut, and you lie on a moveable bed which slowly passes through the centre. X-rays are taken at different angles, and the images produced are put together to produce 2D (two dimensional) cross sections of the body. In some CT scanners, the images produced are three dimensional.

You may be given an injection of contrast (dye) through a drip, so that tissues such as the blood vessels around the gut will show more clearly. You might also be asked to swallow a barium 'drink' or have a barium enema, as for a barium x-ray.

A CT scan of the colon is sometimes referred to as a colonography or a **'virtual colonoscopy'**.

- **MRI (Magnetic Resonance Imaging)**

MRI scans are used to produce cross sectional images of the body. They are being increasingly used to investigate IBD, particularly in children, because they avoid the use of x-rays. Instead, they use strong magnetic fields and radio waves to create images of the inside of the body.

The MRI scanner looks like a long tube or tunnel, and you will be asked to lie on a moveable table which slides slowly inside this tunnel. As for a CT scan, you may be given a contrast (dye) through a drip, or asked to drink a special liquid containing a contrast agent.

The MRI scan is noisy, so you may be provided with ear plugs, or perhaps music to listen to. It is important to lie very still during the scan to stop the images becoming blurred. The scan can take from thirty minutes to over an hour and a half. This means that some people may find it uncomfortable, especially if they suffer from claustrophobia (fear of enclosed spaces). However, for IBD investigations, because the abdomen is usually the area being examined, your head may not be completely inside the scanner for the duration of the test.

MRI has the advantage of not using x-rays, and is a good way of looking at soft tissues such as muscles and the gut, as well as organs such as the liver. It is particularly effective in detecting fistulas (abnormal channels linking different parts of the bowel), and abscesses, and distinguishing between active inflammation and scarring. Some people may have an MRCP (Magnetic Resonance Cholangiopancreatography), this is a special type of MRI used to look at the liver, pancreas, bile duct, and gall bladder. It may be used to look for PSC (Primary Sclerosing Cholangitis).

Because it uses magnets, MRI scans are not suitable for people with pacemakers or certain kinds of metal implants. You will be given detailed information about this before the day of your scan.

- **Ultrasound**

Ultrasound is another form of scan helpful in IBD. Ultrasound scans may be used to look for gall stones and kidney stones. They are also good at detecting collections of fluids and thickened and inflamed parts of the bowel wall. Ultrasound may also show up abscesses and fistulas (abnormal channels linking different parts of the bowel).

Ultrasound scanners work by using 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 scanner then picks up the echoes and converts them into an image.

Ultrasound is safer than x-rays and this type of scan is often used with pregnant women to track the growth of their unborn baby.

Some people with IBD may have an **Endoscopic Ultrasound Scan (EUS)**. This uses a special type of endoscope with a tiny ultrasound transmitter in its tip. This is inserted as for a normal endoscopy - through the mouth to examine the upper part of the digestive system or through the anus to examine the colon and the ileum. This can give especially detailed images of the internal organs and problems such as fistulas or abscesses.

- **PET Scans (Positron Emission Tomography)**

A PET scanning machine is similar to a CT scanner. However, for a PET scan, a small amount of a radioactive 'tracer' chemical is attached to a chemical which occurs naturally in the body, such as glucose. This is then injected into the blood stream. As the tracer breaks down, it gives off energy in the form of positrons (positively charged particles). The scanner detects these particles and uses this information to produce a three dimensional body image.

- **White Blood Cell Scan**

This test looks for areas of inflammation or infection in the body. You will be asked to give a small blood sample. The white blood cells in this will be separated out and then mixed with a small amount of a radioactive 'tracer' chemical. This attaches to the cells, so they are 'tagged' with the tracer. The tagged white blood cells are then injected back into the body through a vein. White blood cells gather in the body at the site of any infection or inflammation. A special scanner picks up the radiation given off by the tracers and then produces an image showing the location of the inflammation or infection.

- **SeHCAT Scan**

A SeHCAT scan is a special type of scan used to test how well your body absorbs bile salts. Bile acid malabsorption can cause diarrhoea. Before the scan, you will be asked to swallow a capsule containing a synthetic bile salt which is slightly radioactive. A special scanner is then used to measure how much of the synthetic bile salt has been absorbed by your body. You will then be given another scan a week later. The amount of synthetic bile salt left in your body after a week can indicate whether you have bile acid malabsorption.

OTHER INVESTIGATIONS

- **Examination Under Anaesthetic (EUA)**

If you have perianal Crohn's, you may be given an examination under anaesthetic. This is often used to investigate fistulas, and sometimes a special probe is used to trace out the route of the fistula.

It also allows any abscesses to be drained. For more details, see our information sheet: **Living with a Fistula**.

HELP AND SUPPORT FROM CROHN'S AND COLITIS UK

All our information sheets and booklets are available to download from our website: www.crohnsandcolitis.org.uk. If you would like a printed copy, please contact our information line – details below.

Crohn's and Colitis UK Information Line: 0300 222 5700: Open Monday to Friday, 9 am to 5 pm except Thursday open 9 am to 1 pm, and excluding bank holidays. An answer phone and call back service operates outside these hours. You can also contact the service by email info@crohnsandcolitis.org.uk or letter (addressed to our St Albans office). Trained Information Officers provide callers with clear and balanced information on a wide range of issues relating to IBD.

Crohn's and Colitis Support: 0121 7379 931: Open Monday to Friday, 1 pm to 3.30 pm and 6.30 pm to 9 pm, excluding English bank holidays. This is a confidential, supportive listening service, which is provided by trained volunteers and available to anyone affected by IBD. These volunteers are skilled in providing emotional support to anyone who needs a safe place to talk about living with IBD.

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We hope that you have found this leaflet helpful and relevant. If you would like more information about the sources of evidence on which it is based, or details of any conflicts of interest, or if you have any comments or suggestions for improvements, please email the Publications Team at publications@crohnsandcolitis.org.uk. You can also write to us at Crohn's and Colitis UK, 45 Grosvenor Road, St Albans, AL1 3AW or contact us through the **Information Line: 0300 222 5700**.

ABOUT CROHN'S & COLITIS UK

We are a national charity established in 1979. Our aim is to improve life for anyone affected by Inflammatory Bowel Diseases. We have over 28,000 members and 50 local groups throughout the UK. Membership costs start from £15 per year with concessionary rates for anyone experiencing financial hardship or on a low income.

This publication is available free of charge, but we would not be able to do this without our supporters and members. Please consider making a donation or becoming a member of Crohn's and Colitis UK. To find out how call 01727 734465 or visit www.crohnsandcolitis.org.uk

