inflammatory bowel disease

Ulcerative colitis and Crohn's disease

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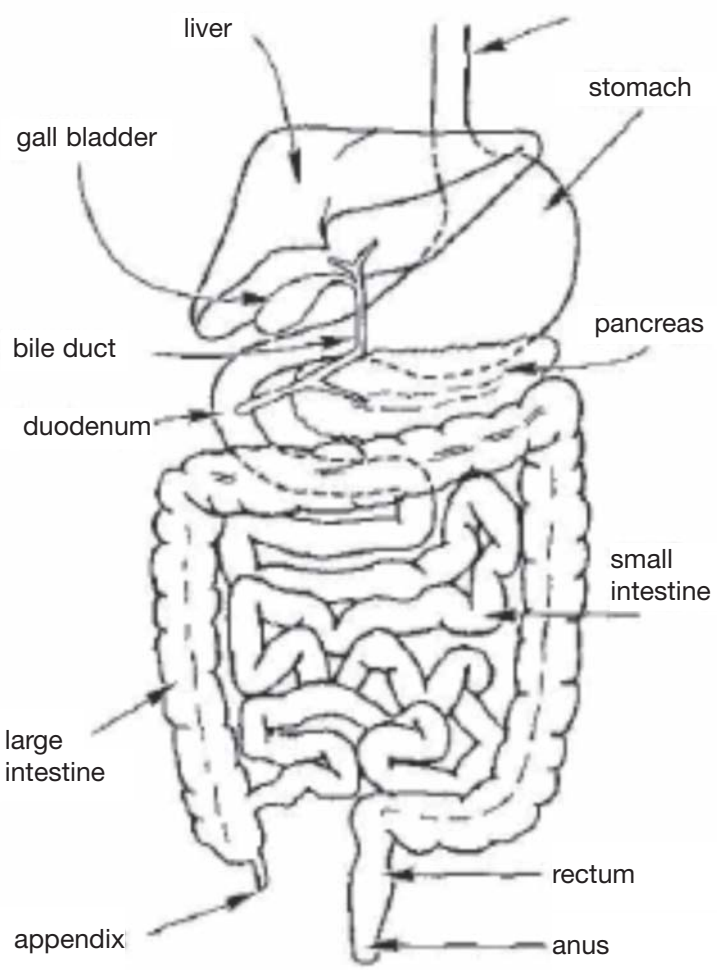
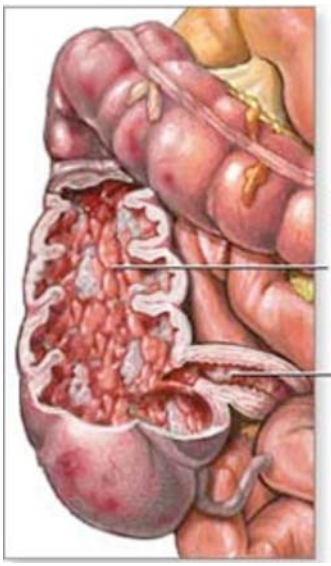
Inflammatory bowel disease is an uncommon but important health problem.

It is particularly likely to affect young people.

The clinical features of the condition vary, so diagnosis can be difficult.
If you have inflammatory bowel disease, this booklet will help you understand the disorder and its treatment.





Inflammatory bowel disease (IBD)

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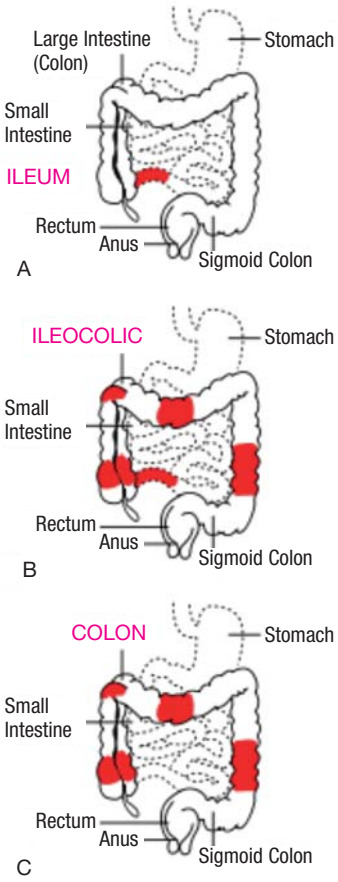

Introduction

The two major inflammatory bowel diseases are

Ulcerative colitis is a chronic inflammatory process which can affect part or whole of the colon. It does not involve any other part of the intestine and the inflammation only involves the lining of the bowel.

Crohn's disease is a chronic inflammatory process which can affect any part of the intestine from the mouth to the anus. The inflammatory process involves the full thickness of the bowel wall.

Both conditions can affect parts of the body outside the bowel resulting in arthritis, skin disorders, hepatitis and inflammation of the eye. The conditions are usually easily distinguishable by biopsy of the bowel wall. However, occasionally differentiation is difficult and *indeterminate* forms of the disease may occur.

The term inflammatory bowel disease is now used to describe **both** ulcerative colitis and Crohn's disease.

These disorders are chronic inflammatory conditions of the wall of the gastrointestinal tract and their cause is still unknown.

What is
inflammatory bowel disease?

The term inflammatory bowel disease is used to describe two chronic disorders which cause inflammation of the small and/or the large bowel. Both conditions can also affect parts of the body outside the bowel and may be associated with poor general health.

Ulcerative colitis

Ulcerative colitis is inflammation of the mucous membrane or superficial lining of the large bowel (the colon). If only the last section of the large bowel (the rectum) is involved, it is called ulcerative proctitis. Even though it affects a smaller area of the colon, it may respond less predictably to treatment.

Crohn's disease

Crohn's disease is inflammation of the full thickness of the intestine rather than just the superficial lining. Unlike ulcerative colitis, Crohn's disease may involve any part of the digestive tract but most frequently occurs in:

- **the terminal ileum** (the last section of the small bowel) and is called ileitis
- **the large bowel** called colitis
- **both the small and large bowel** called ileo-colitis

Microscopic colitis

Microscopic colitis, also called *Collagenous colitis* and *Lymphocytic colitis*, causes diarrhoea but is unrelated to Crohn's disease and Ulcerative Colitis.

It is a microscopic inflammation of the colon which can only be diagnosed by biopsy and the visual appearance is normal.

Pathology

Both ulcerative colitis and Crohn's disease involve inflammation of the bowel wall.

A pathologist can differentiate between the two conditions from a microscopic examination of tissue obtained by biopsy or surgery.

Ulcerative colitis is confined to the colon and to the superficial layers lining the bowel wall. It usually starts and is most severe in the rectum and may spread throughout the colon.

Crohn's disease, on the other hand, can appear in any part of the gastrointestinal tract. Most commonly it involves the colon or the small bowel, especially the ileum.

It can involve the anus and, rarely, the mouth, oesophagus and stomach. Crohn's disease may be discontinuous, skipping areas of the bowel so that the involved area is inflamed and ulcerated, and the unaffected part is normal.

Involving all layers of the bowel wall, Crohn's disease may form:

- **strictures** which are narrowed areas;
- **fistulae** which are connections between the bowel and another loop of bowel, or between the bowel and other organs such as skin, bladder and vagina.

How common is inflammatory bowel disease?

Incidence

Both Crohn's disease and ulcerative colitis have a major impact on health resources and quality of life.

In Australia, the incidence of Crohn's disease is increasing whereas the incidence of Ulcerative colitis is steady. Both Ulcerative colitis and Crohn's disease have a major effect on health resources and quality of life. Currently there are approximately 30,000 people with Crohn's disease and a similar number with Ulcerative colitis. Crohn's disease is also increasing within the paediatric community, so we will see an increase in Crohn's disease in the future in adults. The same disease distribution occurs in the paediatric population.

Geography

Inflammatory bowel disease occurs worldwide but is more common in developed countries. It is uncommon in Africa, Asia and South America.

Age and sex

The incidence of inflammatory bowel disease is similar in males and females. The disease can start at any age and commonly occurs in those aged between 15 and 30 years.

It is also increasingly seen in elderly people. Ulcerative colitis can occur in infants, but Crohn’s disease is rare under the age of five.

Ethnic background

Genetic, racial and cultural factors may influence susceptibility to inflammatory bowel disease.

In the United States, it occurs less commonly in black populations. In New Zealand, it is far less common in Maoris than in those of European descent. In Israel, individuals from a European background (Ashkenazi Jews) are more likely to develop inflammatory bowel disease than those from an African background. (Sephardi Jews). In Australia, it is uncommon in the Aboriginal population. The reasons for these differences are unknown.

What causes inflammatory bowel disease?

The causes of ulcerative colitis and Crohn’s disease are not yet understood. Possible factors include:

Environmental stimuli

The environmental factors interacting with genetic abnormalities to produce Crohn’s disease are unknown but infectious agents such as viruses and bacteria have long been under suspicion. Research continues into the possible role of these agents. Inflammatory bowel disease is not contagious.

The hygiene hypothesis

The frequency of Crohn’s disease has increased substantially over the last 50 years. It is particularly prevalent in the highly industrialised temperate regions, in contrast to less developed countries.

This suggests that critical environmental factors affect the world-wide distribution of inflammatory bowel disease and has given rise to the “IBD hygiene hypothesis”.

This suggests that raising children in extremely hygienic environments predisposes them to immunological diseases such as IBD because their immune system has not been appropriately challenged throughout life by exposure to a variety of infections, in particular parasites and worms.

There is also the concept that such children and adults may be more prone to other infections, particularly with organisms such as mycobacterium paratuberculosis which is found in milk. This particular hypothesis has generated a very large double blind clinical trial in Australia looking at whether long-term high dose antibiotic therapy is of value. It did not show that this treatment was successful. A vaccine, is being developed in the UK.

Helminths (worms), colonise the gut of more than one third of the world’s population, particularly in children living in warm climates who are subject to poor sanitation. Infective forms of these organisms are spread through contact with contaminated soil, food or water.

Helminth colonisation has steadily declined in Western developed countries. This may account for the observation that Crohn’s disease is now more common in an urban versus a rural population; Northern versus Southern regions of the USA and Europe and developed versus less developed countries.

There is now substantial human epidemiological data supporting the hypothesis that Helminths protect individuals from immunological disease, although the leap from this observation to using worms as therapy in ulcerative colitis and Crohn’s disease awaits confirmation.

The Genetic Contribution to Inflammatory Bowel Disease

There are important genetic influences in IBD. Ulcerative colitis and Crohn’s disease are complex disorders resulting from an interplay of poorly defined environmental factors with genes. Evidence of this genetic predisposition include the higher than expected occurrence of IBD in family members of patients with this condition and high prevalence of this disease in Jewish populations of Western countries. While genetic predisposition does not explain the increasing incidence of Crohn’s disease, the interaction with other environmental triggers may be crucial. Family and twin studies show an increased frequency of inflammatory bowel disease in related individuals. Many diseases are the result of a genetic abnormality together with a specific environmental stimulus. Either factor on its own will not result in clinical disease.

Inflammatory Bowel Disease (IBD), which includes both Crohn’s disease and ulcerative colitis, is termed a complex disease. Its cause is not due to a single gene abnormality, but rather multiple genes and the environment interact with each other to determine the overall disease risk to the person.

As these illnesses have dramatically increased in prevalence in the past half-century, life-style and environmental changes such as infectious or toxic agents have been raised as possible major trigger factors, as with other chronic inflammatory diseases such as asthma. However, due to the recognition that the disease was also more likely to occur in relatives of those already affected, an inherited contribution was also acknowledged. The risk for someone with a sibling affected by Crohn's is increased 15 to 35 times and for Ulcerative Colitis is 6 to 9 times the normal population risk.

Genes involved in the maintenance and function of the gut barrier have been examined for possible changes that may predispose to IBD, but no obvious culprits had been found until recently. Three variants within a gene called *CARD15* (or *NOD2*) were discovered to lead to an increase in the risk of Crohn's disease of up to 40 times if inherited on both chromosomes or two at-risk variants were present. This gene is involved in the way in which cells lining the gut recognise and therefore react to bacteria. So these variants may contribute to the chronic overreaction and inflammation seen in this disease. Other genes, such as *DLG* involved in gut cell integrity and SLC22A4 & 5, transporter proteins found in these cells, have also been proposed to have disease susceptibility variants.

Drugs

Drugs used to treat arthritis and rheumatism (non-steroidal anti-inflammatory drugs or NSAIDs), may precipitate an acute attack or a relapse of inflammatory bowel disease.

Smoking

Ulcerative colitis is less common in smokers and there is evidence that both initial attacks and relapses may be associated with stopping smoking. However, smoking is not recommended as therapy because of its well-known adverse effects. Nicotine patches for treatment are rarely useful. Crohn's disease, by contrast, is more common in smokers. Stopping smoking is recommended as it may improve Crohn's disease.

Psychogenic factors

There is no evidence that particular personality types or emotional stress cause inflammatory bowel disease, but emotional stress may increase suffering and the severity of symptoms. The disease or its treatment may be associated with depression.

Immune system

The immune system is involved in inflammatory bowel disease and research into this area is continuing.

The pathological changes that occur in inflammatory bowel disease are similar to those in other diseases where the immune system seems to be overactive. Attempts are being made to dampen down this over activity with drugs known as immunomodulators.

Diet

No specific dietary factors have been shown to cause inflammatory bowel disease, but studies are continuing.

Appendicectomy

Removal of the appendix in early life seems protective for later development of Ulcerative Colitis and perhaps for Crohn's disease.

The symptoms of inflammatory bowel disease

Ulcerative colitis

Common symptoms of ulcerative colitis are:

- **diarrhoea**
- **rectal bleeding** (bleeding from the bowel)
- **passing mucus**
- **abdominal pain & discomfort**

There may also be fever, fatigue, lethargy, loss of appetite and, less commonly, weight loss. Symptoms and their severity depend on the length of bowel involved and the amount of inflammation. Paradoxically, when only a short segment of the lower rectum (Proctitis) is involved, it may produce intense discomfort with bleeding and frequent bowel motions.

Most people with ulcerative colitis have symptoms intermittently. They have relapses in which colitis 'flares up', and remissions with complete freedom from symptoms.

The factors associated with relapse are not always known, but can include upper respiratory tract infection, gastroenteritis, recent cessation of smoking, use of NSAIDs and antibiotics.

Many believe that relapse may follow a stressful event, but in most cases, no precipitating factor can be identified. A small percentage of people never experience complete remission and require continuous medical therapy to control their symptoms. Others only ever have one severe attack of ulcerative colitis.

Crohn's disease

As the disease may affect any part of the gastrointestinal tract from the mouth to the anus, there may be many different clinical features.

Common symptoms include:

- **abdominal pain**
- **diarrhoea**
- **fever, malaise**
- **nausea & vomiting**
- **loss of appetite and weight loss**
- **poor growth in children**

These symptoms are a result of inflammation, thickening and narrowing of the bowel wall. In children, growth rate may slow down and in adolescents, puberty may be delayed.

The early symptoms of Crohn's disease are often subtle and this can delay diagnosis. In general, the more extensive the disease, the more severe the symptoms. The disease tends to relapse and some people need continuous medical therapy to control symptoms.

The first indication of Crohn's disease is usually abdominal pain. This is often a cramping colicky pain around the navel or low on the right side of the abdomen.

Diarrhoea is common and may occur because the colon is inflamed (Crohn's colitis) or because of poor absorption of food when Crohn's disease involves the small bowel. This can lead to weight loss.

Lack of appetite, inadequate food intake or the desire to avoid the painful cramping which often follows eating may also lead to weight loss.

Crohn's disease and ulcerative colitis can produce small ulcers on the tongue or on the lining of the mouth. When Crohn's disease affects the oesophagus, stomach or duodenum, nausea, vomiting and upper abdominal pain can occur.

Areas around the anus are more commonly involved in Crohn's disease than in ulcerative colitis. Skin tags, fissures, ulcers, abscesses or fistulae with a discharge may be present.

Crohn's disease of the lower small bowel (the terminal ileum) may produce symptoms similar to those of acute appendicitis. In such cases, the diagnosis of Crohn's disease may only be made during surgery to remove the appendix.

Microscopic colitis

There may be an association between non-steroidal anti-inflammatory drugs, used to treat arthritis, and the development of microscopic colitis. There is also a recognised association with coeliac disease.

Microscopic colitis affects mainly older people. It is confined to the colon and causes persistent diarrhoea which may be severe and associated with incontinence. It can therefore be socially disabling. Bleeding is unusual. The diagnosis must be made by biopsies taken at the time of colonoscopy, as the colon appears 'normal'.

The pathologist may describe the microscopic colitis as either collagenous or lymphocytic. This makes little difference to treatment.

Other complications such as strictures and fistulae do not occur. Treatment is similar to that for ulcerative colitis. Budesonide (an oral steroid preparation) may be effective in those needing long-term steroid treatment.

Complications

Inflammatory bowel disease may be complicated by problems that occur either in the bowel or elsewhere in the body.

Toxic megacolon

This is a serious but rare complication of ulcerative colitis or Crohn's disease where there is severe colitis and the large bowel rapidly distends. It is due to extensive ulceration of the lining of the bowel, damaging nerves in the bowel wall causing it to lose its elasticity and dilate. Abdominal pain becomes increasingly severe, there is fever, a rapid pulse and abdominal distension. The diagnosis is made from a plain X-ray of the abdomen. If there is no response to medical therapy, urgent surgery may be needed because of the risk of rupture of the colon.

Perforation

This unusual complication may be the end result of toxic megacolon or severe colitis and requires urgent surgery.

Haemorrhage

Bleeding from the bowel is a common feature of colitis. Massive bleeding needs admission to hospital for blood transfusion and may require surgery.

Bowel stricture

Because Crohn's disease involves the entire thickness of the bowel, the formation of strictures or narrowing is common and may lead to obstruction (bowel blockage). Strictures may be due to inflammation (inflammatory strictures) or scarring (fibrosis).

The inflammatory strictures usually respond to medical treatment but the scarring strictures do not and may require surgery. Symptoms suggestive of strictures include increasing episodes of crampy abdominal pain associated with distension of the abdomen, nausea and vomiting.

Abscess

Collections of pus or abscesses can occur in Crohn's disease where the inflammatory process penetrates through the bowel wall and forms a cavity. This may cause increased pain, tenderness and fever. The doctor may be able to feel a tender mass within the abdomen. These commonly occur around the anus.

Fistula

An abnormal connection or fistula may develop between the bowel and the skin, or between the bowel and other hollow organ systems in the abdomen or pelvis such as other bowel loops, the bladder or the vagina. Symptoms may include passing gas and pus in the urine, a vaginal discharge, or diarrhoea and malabsorption of food with bulky, foul-smelling bowel actions.

Poor absorption of nutrients may occur because loops of bowel are by-passed. Fistulae are associated with active inflammatory bowel disease and therefore will not heal unless the disease itself is treated, either medically or surgically.

Fistulae are a feature of Crohn's disease and can help distinguish it from ulcerative colitis.

Cancer

Patients with inflammatory bowel disease, especially ulcerative colitis, are at increased risk of developing cancer of the bowel. This is discussed in more detail in a later section.

Complications elsewhere in the body

About 40% of those with inflammatory bowel disease may have one or more of the following associated disorders:

- **skin disorders** such as ulcers or painful red patches called pyoderma and erythema nodosum
- **back pain** involving the sacro-iliac joints in the lower spine
- **arthritis** of the large joints
- **eye diseases** (conjunctivitis or iritis)
- **narrowing of the bile ducts** (sclerosing cholangitis)
- **liver disease** (chronic hepatitis)
- **gall stones & kidney stones**
- **Osteoporosis**

These problems may occur in association with inflammatory bowel disease, but do not necessarily reflect the current activity of the disease.

Some complications may occur even when the bowel disease is inactive.

Diagnosis
of inflammatory bowel disease

The history of the illness and physical examination can suggest the possibility of inflammatory bowel disease, but an accurate diagnosis needs other investigations. These include:

Examination of the stool

In some situations a stool examination and culture is done to exclude an infection which can resemble inflammatory bowel disease. Examining the stool under the microscope, where inflammatory cells and/or red cells can be identified may also help when looking for evidence of active colitis.

Blood tests

These may be helpful in assessing complications of inflammatory bowel disease, determining whether the disease is in an active stage, and judging the effectiveness of treatment.

Blood tests can also detect anaemia, iron deficiency, low serum proteins or liver abnormalities.

For example, someone who has been bleeding from the bowel may become anaemic due to loss of blood (iron).

Those with small bowel disease may have difficulty absorbing some nutrients.

Markers of inflammation (ESR, CRP) are most useful. Antibody tests (pANCA) are of little use.

If poor absorption continues for a prolonged period and the body stores of these nutrients are depleted, blood tests can identify such abnormalities.

The Crohn's Disease Activity Index (CDAI) measures diarrhoea, pain, quality of life, complications, anaema and weight loss. This index is used by Doctors to monitor severity and progress.

However, it is possible to have severe disease and normal blood tests. There is no specific blood test for inflammatory bowel disease.

Sigmoidoscopy

This is an examination of the lower bowel with an instrument which enables the doctor to look at the lining of the bowel and to take biopsy samples from the bowel wall. As the lower bowel is involved in nearly all those with ulcerative colitis and in about half of those with Crohn's disease, this is an important investigation to diagnose inflammatory bowel disease.

A pathologist's examination of biopsy tissue from the lower bowel helps confirm the diagnosis.

Colonoscopy

This is an examination which allows the lining of all the entire large bowel to be inspected using a flexible tube inserted through the anus. Intravenous sedation is usually needed. Colonoscopy is used to determine how much of the large bowel is involved and the severity of the disease. It also has the advantage of allowing biopsies (tissue samples) to be taken from the bowel wall during the procedure. Colonoscopy is essential to assess abnormalities seen on X-ray, such as strictures or polyps, and can also play a role in detecting cancer early. The terminal ileum may also be inspected and biopsied.

Upper gastrointestinal tract endoscopy

This is an examination, under sedation, of the lining of the oesophagus, stomach and duodenum, using a flexible tube passed through the mouth. It can be used to diagnose Crohn's disease if it is suspected in these areas.

CT Scanning (Computer Tomography)

This can be valuable in the diagnosis of IBD particularly when it involves the small intestine or where there may be local complications such as abscesses.

Barium enema

Barium is introduced into the lower bowel and X-rays are taken. This examination has mostly been replaced by colonoscopy but is sometimes used to show whether strictures or fistulae are present.

Small bowel X-rays

Most of the small bowel is difficult to examine with a flexible endoscope, but an X-ray of the small bowel can assess the degree to which it is involved in Crohn's disease. Barium is taken by mouth or put through a tube into the small bowel and its progress followed by a series of X-rays.

This is not a very accurate method of examining the small bowel but can be useful for defining strictures and fistulae.

Nuclear scanning

A technique using radio-isotope-labelled white cells is now rarely used as a scanning procedure to give information on the extent and activity of disease.

Video capsule endoscopy (VCE)

In video capsule endoscopy a miniaturised video camera somewhat larger than an ordinary medication capsule is swallowed and takes pictures as the capsule passes through the small bowel. The video camera has proved extremely useful in determining the source of chronic intestinal bleeding resulting in anaemia. It can be useful in the diagnosis of Crohn's disease involving only the small bowel and in assessing the severity of the disease process. However, care must be taken to avoid its use when intestinal strictures are present. The capsule may become blocked at the stricture and require surgical removal. The capsule is normally passed in the stool and discarded.

A small bowel x-ray must be done before video-endoscopy to be sure no strictures are present. Allternatively a self-destructing dummy capsule may be used as a test run.

Enteroscopy

Various flexible endoscopes have been designed to allow direct visualization of the small bowel. Current models use a double balloon system to progress the instrument through the small bowel. This is much less time consuming than older models however it is still a difficult and time consuming examination and usually does not allow examination of the entire small bowel. It does have the advantage over VCE that biopsies and therapeutic procedures (eg dilation of strictures) can be performed. It is usually used to confirm abnormalities seen on VCE. It is becoming more widely available.

Histopathology

This is a microscopic examination by a pathologist of biopsies (tissue samples) taken at the time of sigmoidoscopy, colonoscopy, or upper gastrointestinal endoscopy. Histopathology can be helpful in confirming the diagnosis and may help differentiate between ulcerative colitis and Crohn's disease.

Other tests

If liver abnormalities are suspected, you may need an ultrasound, CT scan or specialised imaging of the bile ducts.

Bone Density (Dexascan)

Severe or prolonged bowel inflammation, together with the effects of steroids can lead to bone thinning (osteoporosis). Bone density scans may be needed periodically.

Medical Treatment

Drug therapy is usually needed for treating inflammatory bowel disease.

Cortisone derivatives (steroids) are almost always required for the treatment of acute attacks.

Once the acute attack is under control, maintenance treatment to reduce the chance of further attacks will usually involve long-term use of 5-amino salicylic acid derivatives.

The treatment of Crohn's disease is more complicated than that of ulcerative colitis, because areas of the bowel other than the colon may be involved and, unlike ulcerative colitis, surgery cannot guarantee cure.

A] Corticosteroids

These are the mainstay of treatment. Their benefits outweigh their possible side-effects, especially when used over a short period. Treatment will depend on the length of bowel involved in the attack and the severity of the inflammation. Minor attacks involving only a small length of the lower rectum may be treated with steroid or mesalazine suppositories or enemas only.

Where the inflammation involves the rectum and lower colon, enemas containing steroids (Predsol, Colifoam) or mesalazine (Salofalk, Pentasa) will usually be enough to treat the underlying inflammation. When the disease extends further through the colon, steroids (prednisolone or prednisone) are taken by mouth.

Suppositories or enemas deliver a high concentration of drug to the inflamed area with relatively little absorption into the body and are unlikely to have side-effects, even if used over a long period.

In acute (active) colitis the aim is to bring it under control as quickly as possible with steroids. Once the colitis has settled, the steroids are reduced gradually so that they are used for no more than a few months.

This minimises the possibility of side-effects. Intermittent use of steroid suppositories or enemas have little risk of side-effects when used long term.

Extensive or severe disease may require treatment in hospital with intravenous steroids such as hydrocortisone. Intravenous antibiotics, protein solutions or blood may also be needed. If large doses of oral steroids are required for more than three months in the year, surgery may be necessary.

Corticosteroids are effective in Crohn's disease and are used in the same way as for ulcerative colitis. They may be needed for longer periods and occasionally as maintenance therapy.

Side-effects

Steroids are important in the treatment of inflammatory bowel disease and may be life-saving.

Some people may need high doses for long periods and are then at risk of side-effects.

Visible effects of steroids include:

- **rounding or mooning of the face**
- **redness of the skin (acne)**
- **increased hair growth**
- **easy bruising**
- **ankle swelling**

These effects are reversible if the dose is decreased, and they are preferable to the symptoms that occur if steroids are not used. Corticosteroids can increase the appetite, which may result in weight gain. In those who have taken corticosteroids for a long time, there is a tendency to develop more fat on the trunk of the body, a potbelly, a hump of fat on the upper back and thin arms and legs. Stretch marks can also develop in those on long-term treatment.

Mood changes are common. Most people are happier because they feel better. However, some people feel nervous and jittery. Some become depressed or agitated and sleep poorly.

Occasionally, there is weakness of the muscles in the legs and arms which may cause difficulty in everyday activities such as climbing stairs, getting up from a seat, combing hair or hanging out washing.

Other side-effects are 'invisible' They include:

- **softening of the bones**
- **thinning of the skin**
- **triggering or aggravation of diabetes**
- **increased risk of infection**
- **high blood pressure**
- **reduced growth rates in children**

Low body potassium levels with resultant weakness and fatigue may also occur. Rarely, cataracts in the eye may develop.

Bone damage due to corticosteroids is not common but if it occurs can cause major disability. Softened bones tend to break more easily and are more common in women after menopause. A rare problem is bone damage to the hip joint, known as avascular necrosis of the head of the femur. This can result in permanent damage to the hip joint.

While taking steroid therapy, if there is sudden onset of pain in the hip or the back, seek urgent advice from your doctor.

Corticosteroids can raise blood sugar levels in some people, particularly in those with an inherited tendency towards diabetes.

For those who already have diabetes, control may be more difficult and the dose of insulin or other diabetic drugs may need adjustment.

Corticosteroids weaken the body's defences, making infection more likely.

Do not ignore even minor infections. Report them to your doctor.

Never stop taking steroids suddenly unless advised to do so by your doctor. Usually the dose is tapered slowly. Long-term treatment reduces the body's ability to produce its own corticosteroids and, once steroids are stopped, it may take months for the body to start normal production again. Extra steroids may be needed during the stress of severe illness or an operation. Tell your doctor or dentist if you are, or have been, taking steroids.

Side-effects occur more commonly if high doses of corticosteroids are taken for long periods. For this reason, corticosteroids should be taken in the most effective dosage for the shortest possible time.

Budesonide is an oral steroid preparation which is rapidly destroyed in the liver and therefore avoids many of the side-effects with other steroids. Research suggests it is as effective as prednisolone in Crohn's disease and may be especially valuable in those who need long-term oral steroids, particularly if they have ileal disease.

Corticosteroids offer great benefits and their side-effects are generally predictable and reversible.

B] 5-Amino Salicylic Acid Compounds

(i) **Sulphasalazine (Salazopyrin)**

is a sulphonamide (sulpha drug) linked to an aspirin-like drug (5-amino-salicylic acid, or 5-ASA). The sulpha drug acts as a carrier for 5-ASA and delivers it to the colon where bacteria release the active drug (5-ASA).

5-ASA taken on a continuing basis reduces the frequency of acute flare-ups of ulcerative colitis. For this maintenance treatment to work effectively, the drug must be taken regularly and continued for a minimum of five years after the last acute attack of colitis. Where colitis has been severe or recurrent, the drug may be needed permanently.

Side-effects

The most frequent side-effects of sulphasalazine are due to the sulpha drug.

They include:

- **nausea, vomiting & indigestion**
- **malaise**
- **headaches (usually mild)**
- **changes in the blood count**
- **allergic reactions**
- **reduction in sperm count**
- **fever**
- **skin rashes**

Some side-effects, such as nausea, vomiting, malaise, mild headaches, and changes in the blood count, are related to the dose of the drug. The nausea and indigestion can be reduced by taking a special preparation called enteric-coated Sulphasalazine (Salazopyrin), or by starting with a small dose of the drug and building

up slowly. It may also help to take the medication with food rather than on an empty stomach.

Allergic reactions such as an itchy rash, hives, and swelling of the hands or the face can also occur. Anyone who has previously had an allergic reaction to sulpha drugs should not take sulphasalazine. Sulphasalazine can cause a reduction in sperm count, resulting in infertility, but this is reversible once the drug is stopped.

(ii) Newer 5-ASA drugs

These drugs have been designed to deliver 5-ASA to the ileum and/or colon without the need for a sulphonamide 'carrier'. They are as effective as sulphasalazine and have fewer side-effects.

(a) Balsalazide (Colazide)

Colazide is a pro-drug of mesalazine with the active component connected to an inactive carrier by an azo-bond which is split by bacteria in the colon. Upon reaching the colon, 5-ASA is released directly to the site of inflammation. It is therefore active only in colitis and not in terminal ileal disease. Studies have shown it to be more effective than some pH dependent Mesalazine preparations in treating acute colitis. The dosage in an acute situation begins with 9 x 750mg capsules per day over a period of 12 weeks prior to a gradual reduction to a maintenance level. (4-6 capsules per day)

(b) Mesalazine (Mesasal, Salofalk, Pentasa)

Mesalazine tablets 250mg and 500mg contain (5-amino salicyclic acid, 5-ASA), the active component present in sulphasalazine. Mesalazine tablets are coated in an acrylic-based resin (Eudragit-L) which breaks down when the pH in the bowel becomes more alkaline.

Mesalazine tablets therefore pass intact through the stomach, which is acidic, and release mesalazine in the alkaline environment of the terminal ileum and colon. Unlike sulphasalazine, balsalazide and olsalazine, mesalazine contains no azo-bonds and is not dependent on colonic bacteria splitting the bond to release the active drugs.

As Mesalazine contains only 5-ASA, and no sulpha drug, it has an improved safety and tolerability profile compared with sulphasalazine.

Salofalk tablets and granules are approved in Australia for once-daily dosing, providing patients with inflammatory bowel disease greater convenience and no loss of efficacy. Failure to consistently take medication increases the risk of relapse and because there is no medical cure for inflammatory bowel disease, it is important to manage the condition during periods of remission, as the underlying disease is still present.

Enemas

Salofalk 2g/4g	Not for Crohn's
Salofalk Foam 2g	Not for Crohn's
Pentasa 1g	Not for Crohn's

Salofalk & Pentasa Suppositories 1g are only available on SAS Scheme.

Both Mesasal and Salofalk have Eudragit-L coating: Mesasal is available in tablet form, Salofalk is available as tablets, granules and enemas. Pentasa is available as enemas, sachets and suppositories.

	Salazopyrin	Colazide	PENTASA® Tablets	PENTASA® Sachets	Mesasal® Tablets	Salofalk® Tablets	x Salofalk® Granules
Strength	500mg	750mg	500mg	1g/2g	250mg	500mg	500mg/1g
Recommended Dosage frequency	2-3 X	3 X	2 X *	2 X *	3 X	1 X *	1 X *
Active UC	✓	✓	✓	✓	✓	✓	✓
	Up to 4g daily	6.75g (9)	Up to 4g daily	Up to 4g daily	500mg tds	1.5-3g OD	1.5-3g OD
UC maintenance	✓	✓	✓	✓	✓	✓	✓
	2g	4.5g (6)	# 1.5-2g starting dose daily	1.5-2g starting dose daily	250mg tds	1.5g OD	1.5g OD
Active CD	X	X	✓	✓	✓	✓	X
			Up to 4g daily	Up to 4g daily	500mg tds	3-4.5g OD	
CD maintenance	X	X	✓	✓	✓	✓	X
			Up to 4g daily	Up to 4g daily	250mg tds	1.5-3g OD	

** or in divided daily doses* *# may need to be increased depending on the patient's response*
x Not for Crohn's disease

(c) Olsalazine (Dipentum)

Olsalazine consists of two molecules of 5-ASA joined by an azo-bond. It is delivered intact to the colon and the bond is then split by the bacteria present, yielding two molecules of 5-ASA. This begins to act locally in the colon.

Unless bacteria are present in the terminal ileum, the active part of the drug will not be released, and will therefore have little effect in ileal Crohn's disease. The major side effect is diarrhoea, and this can be reduced by starting the drug in small doses and increasing slowly.

(d) Local Therapies

When disease is limited to the lower bowel 5-ASA preparations can be effective locally. These include Salofalk suspension and foam enemas, and Pentasa enemas and suppositories.

C] Immunomodulatory drugs

These drugs modulate the body's immune system.

(i) Azathioprine (Imuran) or mercaptopurine (Purinethol)

are usually used where there has been a poor response to steroids, or if the disease flares up once the steroid dose is reduced or stopped.

It is possible to use a combination of small doses of steroids and these drugs, which may avoid serious side-effects from larger doses of either drug, but allow control of the disease. This can be particularly important in children where prolonged steroids may reduce growth rate. Benefits do not appear immediately and may take 4-6 months to be evident. These drugs need to be taken long-term and relapse may occur if they are stopped, especially if there has been a good initial response.

Side-effects

Most people tolerate the modest dose of azathioprine or mercaptopurine needed. A few lose their appetite and have some nausea. Allergic reactions are uncommon. In rare cases production of blood cells by the bone marrow may be suppressed, so regular monitoring of blood is important. Any bone marrow suppression is usually reversible when the drug is stopped. Any unusual bleeding or bruising may indicate suppression of bone marrow. If this occurs, stop the drug and inform your doctor.

Because this drug suppresses the immune system, it may reduce resistance to infections and it is important to tell the doctor about any fever, chill or persistent sore throat. Other rare side-effects include inflammation of the pancreas or the liver.

A flu-like illness with fever, headache, muscle and joint pain, nausea and anorexia may require the drug to be stopped immediately.

(ii) Methotrexate

has shown promise in the treatment of Crohn's disease, especially if reactions have occurred with Imuran/mercaptopurine. It can be given either orally or subcutaneously once weekly. The time taken to show a positive response may be much shorter than with Imuran/mercaptopurine. Folic acid supplements are necessary.

(iii) Cyclosporin

Is commonly used to prevent rejection of organ transplants such as kidney, liver or heart. It may also be effective in cases of acute severe ulcerative colitis and Crohn's disease which do not respond to steroids and azathioprine.

It is not widely used, as its benefits have not been shown to outweigh the risks, including kidney damage which may be permanent. There are no apparent benefits with long-term use.

D] Drugs targeting the inflammatory cascade

The initial events that precipitate inflammatory bowel disease are not fully understood. However, once the process starts, there is activation of an inflammatory cascade. In this cascade a chemical is activated which then acts as a stimulus to a second chemical which in turn, in its activated form, serves as a stimulus to the next chemical in the process. The details of this inflammatory cascade are now well understood.

This has been a major advance in our understanding of inflammatory bowel disease. A great deal of research is under way to develop agents which interrupt the inflammatory cascade at various points.

Infliximab (Remicade)

INFLIXIMAB is an antibody that binds to cells producing tumour necrosis factor (TNF), resulting in its inactivation. TNF is the first chemical in the inflammatory cascade. Lack of TNF prevents activation of the next chemical. It has proved to be particularly useful in Crohn's disease. Up to 70% of Crohn's sufferers will show a significant response to infusion of the drug. It has been particularly successful in healing Crohn's fistulae even when these have been unresponsive to other medical and even surgical treatments. Repeated infusions are frequently required usually at 2 monthly intervals. There are a number of possible adverse events including allergic reactions and increased susceptibility to major infections. There is also the possibility that it may increase the risk of developing lymphoma, Hodgkin's disease and other lymphoproliferative disorders at least in Rheumatoid Arthritis, though not with Crohn's disease.

Adverse events with Infliximab/Humira

- Acute allergic reactions albeit rare may occur at the time of infusion. Repeat infusions can be given under steroid cover in a Day Stay Unit.
- Delayed allergic reactions, including severe arthralgias, may preclude any further therapy.
- Drug induced lupus.
- Loss of drug efficacy due to antibody development may require an increase in the dose. This is more likely if there are long gaps between infusions.
- Increased fibrosis (scarring) may result in people who already demonstrate a fibrosing form of Crohn's disease. This is a contraindication to the use of infliximab.
- Co-existing heart failure is an absolute contraindication.
- Severe infections.
  These may occur acutely with pneumonia (viral or bacterial) or septicaemia (blood infection) and other infections. Chronic infections include Tuberculosis. A chest x-ray and a Mantoux test are required before therapy is started.

  Remember
  Benefits
  Balance Any Risks

- INFLIXIMAB has been used in acute severe ulcerative colitis with encouraging results. Trials have demonstrated substantial efficacy.

It is also available to treat paediatric patients aged 6-16 years.

Numerous scientific publications have documented its efficacy and cost benefit in Crohn's disease.

Humira (Adalimumab)

HUMIRA is a subcutaneously administered, recombinant fully human immunoglobulin G1 monoclonal antibody that binds with high affinity and specificity to human TNF.

Trials have demonstrated the efficacy of HUMIRA in treating adult patients with moderate to severe Crohn's disease. HUMIRA is self-administered via sub-cutaneous injection and is given once every two weeks after an induction course. HUMIRA is available as an auto-inject PEN or prefilled syringe. HUMIRA is indicated for both the induction and maintenance of remission in adult patients with moderate to severe Crohn's disease who have failed conventional therapy.

HUMIRA is also subsidised by Medicare under the PBS. An authority prescription is required and patients must meet qualifying and continuation criteria. Some patients

who may qualify include those with a CDAI >300, patients with short gut syndrome or ostomy patients and those patients with extensive small intestine disease. HUMIRA may be used in patients who have become unresponsive or intolerant to INFLIXIMAB.

Adverse events are similar to INFLIXIMAB apart from

- acute allergic reactions which do not occur with HUMIRA as it is not an infusion.
- Loss of drug efficacy due to antibody development is not listed as a side effect

Trials are currently underway to assess the efficacy of HUMIRA in treating UC and paediatric patients.

A number of other therapies directed at specific points in the inflammatory cascade are undergoing clinical trials including Interleukin-10 (IL-10)

This is a cytokine with both anti-inflammatory and immunosuppressive properties.

Toll-like receptors (TLR's) especially 4 and 9 may control the cytokines. Development of antibodies to these TLR's may revolutionise therapy.

E] Antibiotics

(i) **Metronidazole (Flagyl)**

This may be useful in Crohn's disease, particularly for abscesses or fistulae in the anal area. Side-effects of Flagyl include nausea and vomiting, indigestion, decreased appetite and a metallic taste in the mouth. If the drug is taken over a long period, damage to the nerves in the feet and legs can occur (peripheral neuritis). If you develop numbness, tingling or burning in the feet or hands, stop the drug and inform your doctor.

(ii) **Ciprofloxacin**

may also be used for active Crohn's disease with fistulae.

F] Anti-diarrhoeal drugs

(i) **loperamide (Imodium), diphenoxylate (Lomotil), codeine phosphate**

These act by altering the rate at which the contents of the bowel move down the intestine. Most act on the muscle in the wall of the bowel. These drugs are not recommended for children, as their effects are unpredictable in this age group.

During acute flare-ups of extensive inflammatory bowel disease most physicians prefer to avoid these drugs because of some of their complications. Between flare-ups, some who are troubled by urgency, cramps and diarrhoea may find they control these symptoms.

Side-effects

When used during an acute flareup, these drugs may increase the risk of bowel obstruction in small bowel Crohn's disease, and the chance of toxic megacolon in both ulcerative colitis and Crohn's disease.

(ii) **Bile-salt binders (cholestyramine, colestipol)**

These drugs are used mainly in Crohn's disease when the terminal ileum (the end part of the small bowel) has been removed surgically, or is affected by the disease and unable to absorb bile salts.

These drugs bind to bile salts and prevent the fluid loss in the colon caused by free or unbound bile salts.

Side-effects

As well as side-effects such as nausea and heartburn, these drugs can cause severe constipation and can interfere with the absorption of food, calcium and some medications. It is best to take them an hour before or four to six hours after meals.

G] Pain killers (analgesics)

The sensible use of most commonly available analgesics, such as paracetamol (Panadol), is safe in inflammatory bowel disease.

However, if you need to take these frequently, consult your doctor, as abdominal pain may be an important indication of a complication of inflammatory bowel disease and should always be assessed.

Aspirin and non-steroidal drugs should be avoided because of their tendency to cause bleeding from the gastrointestinal tract.

H] Vitamins, minerals and other supplements

Everyone with inflammatory bowel disease needs a well-balanced, nourishing diet.

At times, specific nutritional supplements may be needed. These include iron and folic acid. Vitamin B12 by injection may be required in those who have ileal disease or have had ileal resection.

Fat-soluble vitamins, such as vitamins A and E may be required if taking cholestyramine.

Mineral supplements given by injection or by mouth may be needed in acute illness.

However, once health is regained and the disease controlled, it is rare for vitamin and mineral supplements to be required.

Some studies suggest that fish oils may be of benefit in ulcerative colitis.

I] Exclusion or elimination diets

May occasionally be useful, especially in children, since a few people can also have sensitivities to certain natural or added food chemicals which make symptoms worse. Elimination diets, or any diet that severely restricts what you can eat, should only be used under the guidance of your doctor and a qualified dietitian.

J] Thalidomide

Thalidomide has an effect on TNF, and there may be a future role for this previously discarded medication. Side effects limit its use.

K] Mycobacteria

A mycobacterial cause for Crohn's disease has been pursued since its first description because of its similarity, in terms of pathology, to tuberculosis. A similar bacteria is also responsible for Johne's disease in ruminant animals producing a wasting disease with some similarity to human Crohn's disease.

Because mycobacterium paratuberculosis is found in cattle, sheep and goats, the possibility of human exposure via milk and water has been studied. In general, the studies do not support a role for such an infectious agent. The organism is rarely isolated from patients with Crohn's disease and DNA techniques from tissue in Crohn's and ulcerative colitis are inconclusive.

There have been many therapeutic studies using antimycobacterial therapy. In general, they have been ineffective. More recent studies with a combination of

Clarithromycin and rifabutin are also equivocal and at present, antimycobacterial antibiotics are not recommended for the routine treatment of patients with Crohn's disease. Trials of a vaccine against the mycobacterium are currently being planned.

L] Other Bacteria

The population is fairly equally divided between people having bacteria in the colon with the capacity to produce methane gas and the remainder having a sulfate reducing bacterial population which produce volatile sulfides, particularly hydrogen sulfide gas (H_2S). It is known that nearly all patients with ulcerative colitis are hydrogen sulfide producers. The evidence for this is somewhat circumstantial though it is well recognized that flare-ups of colitis are preceded by the passage of offensive flatus due to H_2S. The bacteria producing this gas are located mainly in the left side of the colon and this is where ulcerative colitis is usually at its worst. Many of the preparations such as salazopyrine and mesalasine are known to bind H_2S.

It has also been demonstrated that H_2S is toxic to the cells of the colon. Therefore a diet that is high in sulfur, particularly as added preservatives (sulfurdioxide S220 on food packaging) have the potential to nourish the bacterial population and make the colitis worse. A similar finding regarding sulfate reducing bacteria has not been found in Crohn's disease.

M] Worms to Treat Colitis

Ulcerative colitis results from an abnormal immune response to normal bacteria in the bowel. Because the disease is more common in industrialised than developing countries, the hygiene hypothesis has been developed. It proposes that the high rate of helminth (worm) colonisation in the bowel in developing countries could be a protective factor. A study from the University of Iowa was a well designed randomised double-blind placebo-controlled trial in which the eggs of a worm, Trichuris suis or placebo were given by mouth at 2 weekly intervals over a 12-week period. The trial involved 54 patients. Significant improvement was found to occur in 13 of 30 patients treated with eggs and in 4 of 20 patients with placebo. While this difference is not statistically significant there is however a trend that encourages a larger trial. We await that with interest. Bon appetit!

N] Probiotics

Bacteria are thought to play an important role in the development of IBD. For example, germ-free animals do not develop colitis. This highlights the potential role for using probiotic preparations as treatment — probiotics are defined as live or attenuated bacteria or bacterial products that contribute a significant health benefit to the host.

They include lactobacillus and acidophilus which are currently being intensively investigated. The probiotic combination VSL#3 is highly effective in treating pouchitis (see page 23) and is being trialed in extensive ulcerative colitis and Crohn's disease.

The role of diet in inflammatory bowel disease

Food allergies

There is no evidence that dietary factors, including food allergies, cause inflammatory bowel disease. Some people believe they must have food allergies because their symptoms are associated with eating. However, abdominal pain, diarrhoea and urgency may be due to the inflammatory bowel disease itself and would occur no matter what food was eaten.

A diet that contains very little in the way of processed food is ideal. Fresh fruit, vegetables, cereals and lean meats are recommended. Most processed foods have sulphites as preservatives and even packaged salads are gassed with sulphur to preserve their shelf life.

If you have Inflammatory Bowel Disease (Crohn's Disease, Ulcerative Colitis or Microscopic Colitis) you may benefit by avoiding Sulphites in food.

There is some evidence that people with Inflammatory Bowel Disease have a population of bacteria in the bowel with the capacity to produce hydrogen sulphide gas. This may be toxic to the cells lining the colon and for that reason a diet that reduces the amount of sulphur available to the bacteria might help minimise the amount of hydrogen sulphide produced. Below is a list of the foods that are high in sulphur, though the emphasis is on the first four where sulphite is added as a preservative.

- Fruit juice and fruit drinks (not freshly squeezed)
- Wine (check the label)
- Dried fruits (check the label)
- Delicatessen meats

Be aware that the following foods are naturally high in Sulphur and may cause problems, if eaten in large amounts. However, these are all good foods in moderation:

- Seafood
- Meat
- Eggs
- Milk
- Nuts
- Some Vegetables

- Fried onions 88mg/100g
- Peas 44mg/100g
- Brussels Sprouts 78mg/100g
- Cabbage (raw) 88mg/100g
- Garlic 170mg/100g

Healthy diet

Most people with inflammatory bowel disease should eat a healthy diet which is adequate in all nutrients to maintain weight, and to promote normal growth and development in children. Greater attention to a healthy diet can help reduce symptoms and replace lost nutrients.

Generally, there is no need to restrict high-fibre foods when the disease is inactive; but some people need a low-fibre diet at times to help minimise symptoms such as abdominal cramps and diarrhoea. Others, after bowel resection (especially of the terminal ileum) may need to adjust their fat intake.

In general, foods can supply all nutrient needs. However, those with complicated inflammatory bowel disease may need nutritional supplements at times.

Protein

An adequate intake of protein is essential for maintenance and repair of tissues. High levels of protein are found in meat, fish, chicken, milk, cheese, yoghurt, eggs, nuts and beans. Breads, cereals and grains also supply some protein. These foods also contribute vitamins and minerals such as many of the B complex vitamins, iron, calcium and zinc. These nutrients are all important to cope with the body's needs.

Carbohydrate

Is an important source of kilojoules for energy. Breads, cereals, pasta, rice, grains, potatoes and fruit are good sources of carbohydrate. These foods have an advantage over sugar (also a carbohydrate) because they contain other important nutrients.

Fat

Is a source of kilojoules and can be important for regaining weight. Some fats also contain essential fatty acids and play a valuable role. The essential fats are found in fish, nuts, seeds, avocado and vegetable oils. Omega 3 fats, including eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), found in fish, may be of some benefit in inflammatory bowel disease. These fatty acids lead to production of eicosanoids, substances which can reduce inflammatory reactions in some parts of the body.

Trials using fish oil have shown mixed results. In some studies, there has been a reduction in the rate of relapse in ulcerative colitis. Others have shown no effect. A study using fish oil in Crohn's disease, achieved greater success, but fish oil cannot yet replace conventional medications used for maintenance of remission. Some people also find that fish oil capsules have an unpleasant taste and increase problems such as heartburn, belching, flatulence and diarrhoea. Eating oily fish (mackerel, sardines, mullet and wild salmon) avoids these problems and fits in with the recommendations to the whole community to consume more omega 3 fatty acids, such as those found in fish. Seeds such as linseeds, canola and soy bean oil and walnuts also contain some omega 3 fats. Within the body, these may be converted to the longer chain fats found in fish, but their effect in inflammatory bowel disease is not known.

Liquid diets

Refined to an easily absorbed form and available as elemental or polymeric diets can be helpful if you are undernourished, or have major bowel narrowing. However, because of their taste, most are not easy to take on a long-term basis. Taking them through a nasogastric tube via the nose into the stomach may be preferable to those who need this form of diet supplement. Generally, liquid diets are used only when more usual therapy has failed, or when there is malnutrition. They appear to be much more successful in children.

Total parenteral nutrition

Fluid nutrients given directly into a vein allows complete bowel-rest if there is severe disease or obstructive symptoms. This may be used as a nutritional support in those who are undernourished, to prepare them for surgery, or if the length of bowel is too short to allow normal nutrition.

Both elemental diets and total parenteral nutrition may be helpful if there are fistulae, because they allow the bowel to rest.

Homeopathic remedies & alternative diet strategies

The anti-candida diet, has been shown to have no long-term therapeutic value. Do not substitute it for other treatment.

Many people are tempted to resort to homeopathic and naturopathic remedies, either as additional, or as alternative therapies to traditional medications. There may be active ingredients in some naturopathic remedies, although these are yet to be defined. So far there have been no proper scientific studies carried out to demonstrate their value.

Herbal remedies are not necessarily safe, and like any drug, they have potential side-effects which may be serious or even fatal.

Surgery
in inflammatory bowel disease

Ulcerative colitis

A small number of people with ulcerative colitis need emergency surgery, if the disease is severe, complicated by toxic megacolon, perforation or severe haemorrhage that fails to respond to medical therapy. All of the large bowel will need to be removed (colectomy), with the end of the small bowel opening onto the skin of the abdominal wall (an ileostomy). Further surgery to 'form a pouch' can be carried out after recovery from the acute episode. Surgery for chronic disease that has not responded to medical therapy involves the removal of the entire large bowel.

Several types of operations are available:

1 Proctocolectomy and ileostomy

This involves removing the whole of the large bowel, including the rectum and fashioning an ileostomy. This operation has been the mainstay of surgical treatment for ulcerative colitis for at least 30 years. The advantage of the procedure is that it can be done in a single operation. The disadvantage is that it results in a permanent ileostomy and a need to wear a bag to collect bowel contents.

Although surgery is a big step, removing the colon cures ulcerative colitis. Partial resection of the colon in ulcerative colitis is not recommended.

2 Ileo-anal pouch

This surgical procedure involves removing the whole of the colon and the rectal lining leaving the muscles of the rectum and the skin of the anal canal. The end of the small bowel is joined to the anal canal and a pouch is constructed to form a new 'rectum'. This operation should be considered for non-urgent surgery for ulcerative colitis, especially in younger people. Older people are more likely to need an ileostomy. The advantage of the pouch construction is that the anal canal sphincter muscles are retained, allowing control of the remaining bowel, most of the time. An appliance similar to that required with an ileostomy is not needed.

There are however disadvantages:

- The surgery is much more complicated and may require three separate operations.

- Acute surgical complications such as:
  - Leakage from the anastomosis (join in the bowel)
  - Infections
- Increased risk of later small bowel obstruction.

Other complications include frequent bowel motions, night-time incontinence and pouchitis.

Pouchitis

This is inflammation of the ileo-anal pouch affecting one in three patients resulting in severe diarrhea. The cause is not clearly understood but bacteria play a pivotal role. Treatment includes antibiotics, local steroid enemas and probiotics such as VSL#3.

Approximately 1-2 in 10 patients will require colectomy, or removal of their whole colon, for treatment of the disease which has not responded to intensive medicinal therapy. Perhaps 30% of patients may then develop inflammation in the "pouch" fashioned inside the anus to function as a reservoir for normal defecation. There is now good evidence that a once daily high dose probiotic combination (VSL#3) is effective in maintaining remission after the pouchitis has been initially treated with antibiotics. This has been associated with a great improvement in quality of life. There is still however, little evidence that probiotic therapy as an alternative treatment for inflammatory bowel disease, itself will be successful.

3 Appendicectomy

Some patients with severe resistant proctitis only may benefit from removal of the appendix. Lymphoid tissue in the appendix appears to play a key role in modulating immune reactions in gut tissue. Removal of the appendix has shown benefit in controlling ulcerative proctitis in some patients resistant to conventional therapy. These early results need to be confirmed.

Crohn's disease

Surgery is used only for complications of Crohn's disease. Crohn's disease cannot be cured surgically. It can recur in a previously unaffected part of the bowel. If several operations are required to remove diseased, scarred or narrowed areas, the bowel may become significantly shortened.

Urgent surgery is essential for acute complications such as toxic megacolon, fulminant colitis, perforation and haemorrhage. Surgery may also be needed when medical therapy fails to control the symptoms of Crohn's disease. However, because Crohn's disease tends to recur, as little bowel as possible is removed.

Ileo-anal pouch surgery, is not appropriate in Crohn's disease.

Surgery may be required in small bowel Crohn's disease for complications such as obstruction, perforation, abscess, or fistulae. This usually means removing the part of the small bowel that is severely affected (called resection) and joining the two ends together (called anastomosis).

Fistulae

The use of Infliximab/Humira has reduced the number of patients requiring surgery for fistulae. It is important that they are used cautiously if strictures are present.

Strictures

Strictures in Crohn's disease may be due to inflammatory swelling or to scarring. The distinction is important, since inflammatory

strictures may respond to drug and nutritional therapy with elemental or parenteral diets. However, strictures due to scars do not respond to this treatment and may require surgery. An operation called stricturoplasty can be carried out. This is a method of widening such strictures without removal (resection) of the bowel.

Strictures in the colon may be inflammatory or fibrotic, or sometimes the result of cancer. Such strictures always need assessment with colonoscopy so that the most appropriate treatment can be given.

Perianal disease

Operations for perianal problems involve draining abscesses and closing fistulae. Often wound healing is slow. In some cases of severe perianal disease, an elemental diet, total parenteral nutrition, or sometimes, an ileostomy, may help diminish the faecal stream and allow resistant perianal disease to heal. Antibiotic treatment with Flagyl may also be helpful. Infliximab/Humira are often highly effective in healing perianal and rectovaginal fistulae.

Cancer

Colon cancer is the most common internal cancer in the community, affecting 1:20 Australians. The risk also doubles if there is a family history of polyps or colon cancer.

Ulcerative colitis

With extensive severe disease of long duration, there is an increased risk of cancer developing in the large bowel.

Even if the colitis is limited to the rectum and sigmoid, the risk of cancer is increased and after about 10 years, the risk is higher than in those of the same age in the same community without colitis. Because of the risk of colon cancer, it is essential to have regular check-ups for this condition. Those with extensive ulcerative colitis of 8-10 years duration should have regular colonoscopy.

The colonoscopist takes biopsies of the colonic mucosa (the lining of the large bowel) and examines them to see if any pre-cancerous change has occurred.

If such a change is present, there is an increased risk of developing colon cancer, and the usual advice is to reduce the risk by removing the colon. Sometimes, those with extensive severe colitis are advised to have a colectomy after 10 years.

Crohn's disease

The risk of cancer developing in those with Crohn's disease is higher than for people of a similar age in the community. However, the risk is less than in ulcerative colitis.

Even so, your doctor may recommend a cancer surveillance programme, especially if you have Crohn's colitis.

Living with inflammatory bowel disease

Treatment of inflammatory bowel disease aims for most people to lead useful, productive lives, even though they may need to take medications, and occasionally need admission to hospital.

Between bouts of the disease, most people feel well. Inflammatory bowel disease is not a barrier to success, either professionally, socially, or in sport. Nor is it a problem for marriage, sexual activity, having children, caring for a family, enjoying sport or other recreational activities.

When the disease is active, it is important to prepare for social situations and travel. Diarrhoea in inflammatory bowel disease can pose a problem at work, when shopping or attending social functions, so note the location of toilets in stores, restaurants and other public places during flare-ups. Some people carry spare under-clothing or wear a sanitary pad in case of accidental soiling. When travelling for long distances or going overseas, take an adequate supply of medications. In certain countries, it is important to avoid drinking the local water or eating raw fruit or vegetables for fear of making diarrhoea worse. It may be difficult to distinguish between a flare-up and travellers diarrhoea.

Consult your doctor before travelling, and ask for the names of doctors you could consult in the area you are visiting.

Ulcerative colitis

Medical therapy with corticosteroids and early surgery has reduced deaths from acute ulcerative colitis from over 30% before 1950 to less than 1% in specialist centres since the 1970s.

The outcome of an acute flare-up of ulcerative colitis is worse if the whole of the bowel is involved and if the attack is severe. Life expectancy with ulcerative colitis is similar to that of the general population.

Most people lead normal lives apart from difficulties associated with acute episodes.

Ulcerative colitis can be cured by removal of the bowel (colectomy), if necessary.

Crohn's disease

In Crohn's disease, the risk of early death is slightly increased due to the greater need for surgery and the associated complications. The risk is greatest in those with severe disease, particularly in the elderly. Most people with Crohn's disease have a normal quality of life. Sometimes chronic ill-health or multiple operations may interfere with usual activities. Preventing recurrence is the major aim of therapy.

Having
a family

Most women with inflammatory bowel disease can conceive as easily as other women and can expect to deliver a normal full-term infant.

There is no increase in the incidence of congenital deformities in the child.

Some males with inflammatory bowel disease are temporarily infertile because sulphasalazine (Salazopyrin) depresses sperm count. This is completely reversible, and the sperm count rapidly returns to normal once the drug is stopped.

Using a newer 5-ASA compound (such as Colazide, Mesasal, Salofalk, Pentasa, and Dipentum) avoids the problem.

The effect of pregnancy on inflammatory bowel disease

If inflammatory bowel disease is in remission at the time of conception, there is no increased risk of relapse during that pregnancy.

When the disease is active at the start of the pregnancy, there may be continuing symptoms during the pregnancy and after delivery. Medical treatment is usually safe and effective in controlling symptoms.

The treatment of inflammatory bowel disease during pregnancy and the use of drugs.

The treatment for either Ulcerative Colitis or Crohn's disease during pregnancy is the same as when not pregnant. Neither sulphasalazine nor corticosteroids are associated with an increased risk of foetal abnormalities. Sulphasalazine is safe after the baby is born, and the small amount found in breast milk is not a problem for the baby.

Azathioprine should be used with caution during pregnancy as should Biologic Therapies. There have been many reports of women taking these drugs throughout pregnancy without any effect on the baby.

Surgery can be carried out during pregnancy if needed, although it is technically more difficult and carries an increased risk of miscarriage.

An ileostomy or an ileo-anal pouch should not interfere with pregnancy or a normal vaginal delivery.

Methotrexate is absolutely contra indicated in pregnancy.

5-ASA preparations are safe in pregnancies.

On-going treatment

As with other chronic disorders such as diabetes, asthma and arthritis, those with inflammatory bowel disease need their condition monitored so that the doctor can judge response to treatment and note whether there are side-effects from the drugs.

This consists of periodic consultation with the doctor, and, sometimes, blood tests.

It may also include sigmoidoscopy or colonoscopy to determine the extent and severity of disease, and when appropriate, biopsies from the lining, as part of a cancer surveillance programme.

With severe chronic disease, more frequent consultations and blood tests may be needed to assess the activity of the disease or to determine if there is anaemia or nutritional problems. For those taking azathioprine/mercaptopurine or methotrexate, regular blood tests are essential to detect early side-effects. For those who have prolonged remissions, only occasional consultations may be necessary. If relapse occurs or unusual symptoms develop while taking drugs, contact your doctor.

The remission phase of the illness means that the inflammation is suppressed but does not mean that the disease has gone away. Do not alter your drug therapy without discussing the situation with your doctor.

Stopping drugs such as corticosteroids suddenly can be dangerous.

Stopping other medications may cause a flare.

Psychological problems

Neither ulcerative colitis nor Crohn's disease is a result of stress or any other known psychological factor.

However, a person with inflammatory bowel disease may suffer psychological problems as a result of having the disease.

The stress of having the condition, the need for repeated investigations, the side-effects of treatment or the complications of the disease can all have an effect. Symptoms such as diarrhoea are particularly difficult as it can interfere with daily activities and may be a source of embarrassment which is difficult to discuss with friends or employers.

Fear of a flare-up is a concern. There is no known precipitant of most acute episodes, but some people fear they have done something to cause a relapse. In those with small bowel disease with narrowing of the bowel, a high-fibre diet, particularly with fibrous vegetables or nuts may precipitate pain.

Some people may be worried about domestic life, sexual performance, ability to have children, ability to hold down a job, or participation in hobbies or sport. As mentioned earlier, inflammatory bowel disease need not interfere with normal lifestyle.

School can present problems for children with inflammatory bowel disease. Try to anticipate potential problems. Tell teachers about the disorder and the nature of the condition and its special needs, such as having to leave class to go to the toilet, the possibility of missing some school, and the need to take medications at school. Teachers and peers should understand that inflammatory bowel disease is not contagious. The decision to tell friends is a personal one, but it may help your friends to understand your condition and how you react to it.

Do not hide from yourself or your doctor psychological factors that may be interfering with your quality of life. Some psychologists or psychiatrists specialise in helping people with inflammatory bowel disease. This type of counseling can be of great benefit.

Alterations in mood are common at different stages of the disease.

Most people are anxious when a flareup occurs, or when they are worried that a flareup may interfere with special occasions.

If your doctor has a sympathetic ear, you and your family understand the illness, and you become involved in self-help groups, you may find it easier to cope. The Australian Crohn's and Colitis Association (ACCA) provide social, educational and emotional support.

Stoma

Those who need an ileostomy have added fears. They are concerned about cleanliness, and worry about odours, noises, and unexpected spillage, and how they will cope.

They may also fear the reaction of others to their stoma. Parents may feel guilty about disease in their child. Other members of the family may resent the attention given to the person with inflammatory bowel disease, or there may be feelings of resentment and a failure to understand the nature of the illness.

Family members, other than the person involved, should learn about and understand the condition and its treatment.

Most patients find their fears regarding ileostomy are unfounded. The majority are amazed at how well they function and how few problems they encounter. A Stomal Therapist (nurses who specialise in stomal care) will provide valuable education and guidance in those considering surgery. Valuable support may also be obtained from your local ostomy-association who will facilitate a meeting with someone who already lives with a stoma.

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Glossary
of terms

Anorexia
Loss of appetite.

Anastomosis
The joining of two segments of the bowel so that they continue to function without the need for a colostomy.

Appendicectomy
Removal of the appendix, currently done either by laparoscopic surgery or by a small incision in the right side of the abdomen.

Avascular necrosis
Loss of blood supply a the end of a bone making up part of a joint.

This usually occurs in the hip joint when the blood supply is lost to the head of the femur.

Azathioprine (Imuran)
An immunosuppressive drug.

Balsalizide (Colazide)
A new preparation useful in both the acute treatment and maintenance treatment of ulcerative colitis.

Biopsy
Sample of tissue, usually taken by an instrument called a biopsy forceps, often at the time of surgery or diagnostic examination such as colonoscopy or endoscopy.

Bone Density
This is measured by scans that assess the density of the bone and indicate the presence or likelihood of osteoporosis.

Bowel resection
Removal of a segment of the bowel at surgery.

Carbohydrate
A collective term used to describe sugars and starches. Carbohydrates may be simple sugars, such as glucose or sucrose, or complex, such as starch.

Carcinoma
Cancer.

Cholestyramine
A drug that binds bile salts.

Colectomy
Surgical removal of the colon.

Colitis
Inflammation of the large bowel (colon).

Colon
The last part of the gastrointestinal tract. Also called the large bowel.

Colonoscope
A fibre-optic flexible instrument which can be inserted through the anus to inspect the lining of the large bowel. This process is called colonoscopy.

CT Scan
A computered tomography scan of the abdomen carried out by radiologists.

Colostomy
A surgical procedure where the large bowel is brought out onto the abdominal wall. The contents are then collected into a colostomy bag.

Contagious
A transmissible infection.

Corticosteroids
Drugs used to suppress inflammation. The commonly-used ones are known as prednisolone, prednisone and hydrocortisone.

Diarrhoea
An increase in frequency, fluidity and volume of the stool.

Digestive tract
This refers to the entire alimentary tract from the mouth to the anus.

Dipentum (Olsalazine)
This is a form of mesalazine active only in the colon.

Distal (caudal)
Further away or more distant.

Dysplasia
A change in the normal appearance (described microscopically) of the surface lining (mucosa) of the bowel.

Elemental diet
A liquid diet not requiring digestion by the small intestine.

Erythema nodosum
A painful lumpy rash on the shins.

Extra-intestinal
Outside the bowel.

Fibrosis
Scarring.

Fissure
A narrow ulcer or tear, eg. an anal fissure.

Fistula
An abnormal connection between the bowel and other tissues such as other bowel, the vagina, the bladder or the skin.

Gastroscope
A fibre-optic instrument, inserted through the mouth, used for inspecting the lining of the gullet, stomach and the duodenum.

Genes
Protein molecules of DNA and RNA that influence the pattern of disease.

Histopathology
Microscopic examination of material removed at endoscopy.

Humira
Is a subcutaneously administered, recombinant fully human immunoglobulin G1 monoclonal antibody that binds with high affinity and specificity to human TNF.

Ileitis
Inflammation of the distal small bowel (ileum).

Ileo-anal anastomosis
The joining together of two pieces of bowel, the ileum and the anal canal – after the removal of the colon.

Ileostomy
A surgical procedure where the small bowel is brought out onto the abdominal wall. The contents of the bowel are then collected in an ileostomy bag.

Ileum
The distal (last) third of the small bowel.

Immunosuppressive agents
Drugs used to suppress the body's immunological defences in order to suppress inflammation.

Infliximab
An antibody to Tissue Necrosis Factor given intravenously and especially effective in healing Crohn's fistulae.

Iritis
Inflammation of the pupil and its surrounding tissues.

Malabsorption
Poor absorption of nutrients from the gut. This may be due to incomplete digestion and/or incomplete absorption of food. It is often used to refer to specific nutrients, eg: fat malabsorption.

Methotrexate
An inmuno-modulatory agent used as an alternative to imuran/mecaptupurine in the treatment of both Crohn's disease and to a lesser extent ulcerative colitis.

Metronidazole (Flagyl)
A drug used to treat infection and suppress inflammation.

Mercaptopurine
An immune suppressive drug.

Mesasal (mesalazine)
A drug used in the maintenance therapy of inflammatory bowel disease.

Microscopic colitis
Microscopic inflammation of the superficial lining of the colon.

Nasogastric tube
A tube placed into the stomach via the nose and the oesophagus.

Oesophagus
The tube between the mouth and the stomach also referred to as the gullet.

Olsalazine (Dipentum)
A drug used in the maintenance therapy of inflammatory bowel disease.

Omega 3 fats
A type of polyunsaturated fat found in fish, and also in linseeds, canola, soybean oil and walnuts.

Osteoporosis
Thinning of the bones which is due to a loss or protein and calcium and occurs in inflammatory bowel disease or as a consequence of steroid therapy.

Parenteral
Any route of delivery of a drug or nutrition that excludes the gut – this usually refers to intravenous delivery.

Pentasa (mesalazine)
A form of mesalazine active in the colon for treatment of ulcerative colitis.

Pouchitis
Inflammation of the pouch which is fashioned inside the anus following removal of the whole colon in ulcerative colitis.

Probiotics
Live or attenuated bacteria or bacterial products that confer a significant health benefit to the host.

Proctitis
Inflammation of the distal large bowel (rectum).

Proximal
Closer to the beginning of a segment of bowel, eg: proximal colon.

Pyoderma gangrenosum
A skin ulcer preceded by infection of the skin. One of the extra-intestinal manifestations of inflammatory bowel disease.

Rectum
The last 15-20 centimetres of the large bowel.

Recurrence
The recurring of a disease, usually identified clinically, radiologically or pathologically.

Relapse (flare-up, exacerbation)
A situation where symptoms occur as a result of activity of a disease.

Remission
The situation where disease activity has settled and the individual is well.

Salofalk (mesalazine)
A mesalazine preparation in tablet, granule, suppository and enema form useful in the treatment of ulcerative colitis.

Sclerosing cholangitis
A narrowing of the bile ducts inside and outside the liver.

Sigmoidoscope
A rigid or flexible fibre-optic instrument which is inserted via the anus and used to directly inspect the lining of the lower 20 to 60 centimetres of the large bowel.

Stricture
A narrowing, usually of the bowel.

Strictureplasty
An operation to widen a narrowed area of the bowel, usually the small intestine.

Sulphasalazine (Salazopyrin)
A drug used to maintain remission in inflammatory bowel disease. It consists of a sulphonamide (sulphapyridine) bound to 5-amino salacylic acid.

Systemic symptoms
These are general effects of a disorder on the body, eg. fever.

Terminal ileum
The last part of the ileum, where it joins the large bowel at the caecum.

Toxic megacolon
A complication of inflammatory bowel disease shown by marked distension of the large bowel when it is severely inflamed and ulcerated.

Ulcer
A defect in the lining of the bowel.

Video Capsule Endoscopy
Swallowed Capsule that allows a video recording of the inside of the small intestine..

VSL#3
A probiotic preparation comprising 8 different probitotic bacteria very useful in the treatment of pouchitis.

Wireless Capsule Endoscopy
Swallowed capsule that allows a video recording of the inside of the small intestine.

Notes