CROHN'S & COLITIS FOUNDATION OF AMERICA

THE FACTS ABOUT

Inflammatory Bowel Diseases

Contents

ABOUT CCFA

The Crohn's & Colitis Foundation of America (CCFA) is a non-profit, volunteer-driven organization dedicated to finding the cures for Crohn's disease and ulcerative colitis and improving the quality of life of children and adults affected by these diseases. CCFA was established in 1967 by Irwin M. and Suzanne R. Rosenthal, William D. and Shelby Modell, and Henry D. Janowitz, MD.

Since our founding, CCFA has remained at the forefront of research in Crohn's disease and ulcerative colitis. Today, we fund cutting-edge studies at major medical institutions, nurture investigators at the early stages of their careers, and finance underdeveloped areas of research.

In addition, CCFA provides a comprehensive series of education programs, resources, support services and advocacy initiatives to members of the IBD community, including patients and caregivers.

The Crohn's & Colitis Foundation of America provides information for educational purposes only. We encourage patients to review this educational material with their healthcare professional. The Foundation does not provide medical or other healthcare opinions or services. The inclusion of another organization's resources or referral to another organization does not represent an endorsement of a particular individual, group, company, or product.

We can help! Contact us at:

888.MY.GUT.PAIN
(888.694.8872)

info@ccfa.org

www.ccfa.org

Crohn's & Colitis Foundation of America
733 Third Avenue,
Suite 510
New York, NY 10017

FACT BOOK Highlights

How many are affected by the disease? Research studies continue to show a rise in the number of people living with inflammatory bowel disease (IBD), reflecting a need for more research to find a cure.

- Approximately 1.6 million Americans currently have IBD, a growth of about 200,000 since the last time CCFA reported this figure (in 2011).
- As many as 70,000 new cases of IBD are diagnosed in the United States each year.
- There may be as many as 80,000 children in the United States with IBD.

Treatment. Major scientific advances, within the fields of genetics, immunology, and microbiology, have led to:

- A greater understanding of the underlying mechanisms involved in IBD.
- An increase in the number of treatment options available for IBD patients.
- Increasingly effective IBD treatments.

What we know now. CCFA remains at the forefront of IBD research and continues to propel the field forward. CCFA-supported research studies have helped:

- Identify over 160 genes associated with IBD. Investigation of these genes will revolutionize our understanding of Crohn's disease and ulcerative colitis and form the basis for discovering new drugs and diagnostics.
- Determine that the gut microbiome (the bacteria and viruses that inhabit the gut) is a key link between genetic susceptibility and IBD onset/progression. By identifying the bacteria and viruses that play a role in IBD, researchers can create medications that specifically manipulate these microbial targets.

A world of support for patients. To ensure that everyone affected by IBD has access to the resources they need to effectively manage their disease, CCFA provides a comprehensive series of education programs and support services, including:

- Local chapters
- In-person and online support groups
- In-person and online educational activities
- Disease-management tools

To find more information about IBD and CCFA's research efforts, or to get involved, visit CCFA's website at www.ccfa.org or contact the IBD Help Center via telephone 888-694-8872 or email info@ccfa.org.

Introduction

Inflammatory bowel diseases (IBD), which include Crohn's disease and ulcerative colitis, affect as many as 1.6 million Americans, most of whom are diagnosed before age 35. These chronic, life-long conditions can be treated but not cured. IBD can significantly affect a patient's quality of life and may have a high financial burden.

By generating greater awareness of Crohn's disease and ulcerative colitis, the Crohn's & Colitis Foundation of America (CCFA) believes that more progress can be made toward finding a cure and reducing the significant impact of these diseases on individuals and the US healthcare system.

CCFA is pleased to provide this Fact Book, which compiles important statistics and information and offers a brief overview of IBD. This Fact Book will be of use to patients and their families, as well as physicians and others with an interest in broadening their knowledge of IBD.

WHAT ARE INFLAMMATORY BOWEL Diseases?

Crohn's disease and ulcerative colitis are inflammatory bowel diseases that cause chronic inflammation and damage in the gastrointestinal (GI) tract (Figure 1). The GI tract is responsible for digestion of food, absorption of nutrients, and elimination of waste. Inflammation impairs the ability of affected GI organs to function properly, leading to symptoms such as persistent diarrhea, abdominal pain, rectal bleeding, weight loss and fatigue.

While ongoing inflammation in the GI tract occurs in both Crohn's disease and ulcerative colitis, there are important differences between the two diseases.

Crohn's Disease

Crohn's disease can affect any part of the GI tract, from the mouth to the anus. It most commonly affects the end of the small intestine (the ileum) where it joins the beginning of the colon. Crohn's disease may appear in "patches," affecting some areas of the GI tract while leaving other sections completely untouched. In Crohn's disease, the inflammation may extend through the entire thickness of the bowel wall.

Ulcerative Colitis

Ulcerative colitis is limited to the large intestine (colon) and the rectum. The inflammation occurs only in the innermost layer of the lining of the intestine. It usually begins in the rectum and lower colon, but may also spread continuously to involve the entire colon.

Indeterminate Colitis

In some individuals, it is difficult to determine whether their IBD is Crohn's disease or ulcerative colitis. In these rare cases, people are given the diagnosis of indeterminate colitis (IC).

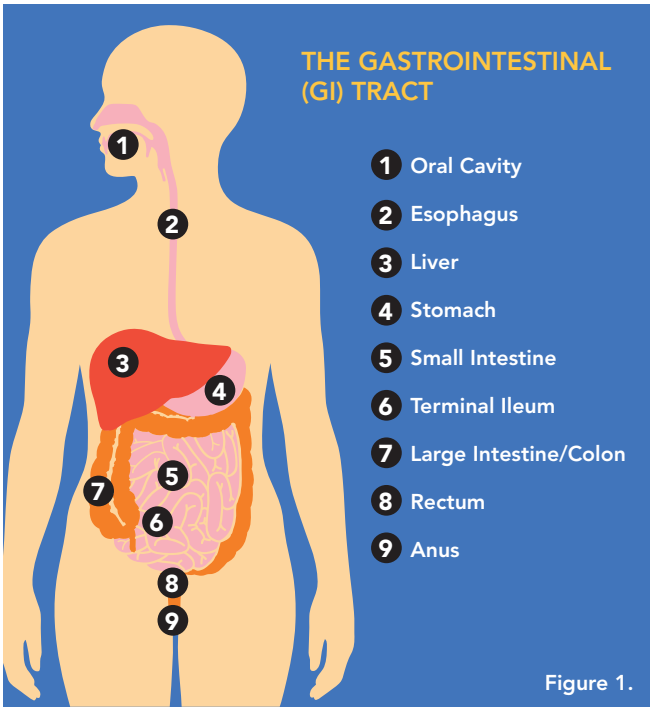


Figure 1.

Cause

While the exact cause of IBD is not entirely understood, it is known to involve an interaction between genes, the immune system, and environmental factors (Figure 2). The immune system usually attacks and kills foreign invaders, such as bacteria, viruses, fungi, and other microorganisms. However, in people with IBD, the immune system mounts an inappropriate response to the intestinal tract, resulting in inflammation.

This abnormal immune system reaction occurs in people who have inherited genes that make them susceptible to IBD. Unidentified environmental factors serve as the "trigger" that initiates the harmful immune response in the intestines.

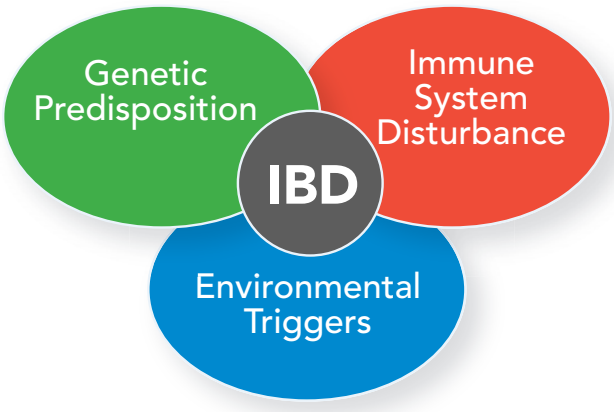


Figure 2.

Historical Perspective and Research Advances

Ulcerative colitis was first described in 1875 by two English physicians, Wilks and Moxon, who distinguished it from diarrheal diseases caused by infectious agents. Reports of a disease with similar symptoms to ulcerative colitis date back to before the Civil War and even many years before that, although it was not named as a distinct disease until 1875.

Crohn's disease was first described in 1932 by three doctors—Burrill Crohn, Leon Ginzberg, and Gordon D. Oppenheimer. At the time, any disease in the small intestine was thought to be intestinal tuberculosis. These doctors collected data from 14 patients with symptoms of abdominal cramps, diarrhea, fever, and weight loss, which showed that the symptoms were not the result of tuberculosis or any other known disease. They described a new disease entity, which was first called regional ileitis, and later, Crohn's disease.

In the years since inflammatory bowel diseases were identified, major scientific advances, specifically in the fields of genetics, immunology, and microbiology, have led to greater understanding of the underlying mechanisms involved in IBD, resulting in the development of increasingly effective treatments.

WHAT ARE THE SIGNS AND SYMPTOMS OF IBD?

As the lining of the intestine becomes inflamed and ulcerated, it loses its ability to adequately process food and waste or absorb water, resulting in loose stools (diarrhea), and in severe cases weight loss. Most people with Crohn's disease or ulcerative colitis experience an urgency to have a bowel movement and have crampy abdominal pain. Inflammation can cause small sores (ulcers) to form in the colon and rectum. These can join together and become large ulcers that bleed, resulting in bloody stools. Blood loss can eventually lead to anemia if unchecked.

The symptoms of IBD vary from person to person, may change over time, and can range from mild to severe. People with IBD often go through periods when the disease is quiet with few or no symptoms (remission), alternating with times when the disease is active and causing symptoms (flares).

Symptoms related to inflammation of the GI tract:	General symptoms that may also be associated with IBD:
• Diarrhea • Abdominal pain • Rectal bleeding • Urgent need to move bowels • Sensation of incomplete evacuation	• Fever • Loss of appetite • Weight loss • Fatigue • Night sweats • Loss of normal menstrual cycle

Disease Progression Over Time

Once IBD has been diagnosed, the symptoms can often be effectively managed. However, Crohn's disease and ulcerative colitis are chronic illnesses, and changes are likely to occur over time. Symptoms may recur at times and complications may develop.

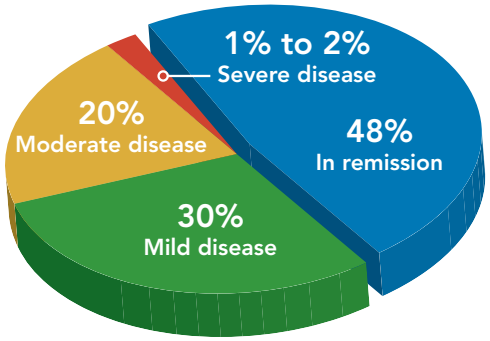
Symptom Recurrence

Ulcerative colitis:

In a given year:

- 48% of people with ulcerative colitis are in remission
- 30% have mild disease activity
- 20% have moderate disease activity
- 1% to 2% have severe disease[1]

Seventy percent of patients who have active disease in a given year will have another episode of active disease in the following year. Only 30% of those in remission in a given year will have active disease in the following year. The longer a person with ulcerative colitis remains in remission, the less likely he or she is to experience a flare-up of the disease in the following year.



Crohn's disease:
Because Crohn's disease can occur in various areas of the GI tract, disease activity and severity can vary widely over time. Most patients have active disease at the time Crohn's disease is diagnosed. With medical and/or surgical treatment:

- About 50% of patients will be in remission or have mild disease over the next five years
- 45% of those in remission will remain relapse-free over the next year
- 35% will have one or two relapses
- 11% will have chronically active disease

For a Crohn's disease patient in remission, relapse rates at one, two, five, and ten years are estimated at 20%, 40%, 67%, and 76%, respectively.[2]

IBD Complications

In addition to the signs and symptoms of IBD described on the preceding pages, some people develop complications that may require urgent medical care.

Complications of ulcerative colitis include:

- Heavy, persistent diarrhea, rectal bleeding, and pain
- Perforated bowel—chronic inflammation of the intestine may weaken the intestinal wall to such an extent that a hole develops
- Toxic megacolon—severe inflammation that leads to rapid enlargement of the colon

Complications of Crohn's disease include:

- Fistula—ulcers on the wall of the intestine that extend and cause a tunnel (fistula) to another part of the intestine, the skin or another organ.
- Stricture—a narrowing of a section of intestine caused by scarring, which can lead to an intestinal blockage
- Abscess—a collection of pus, which can develop in the abdomen, pelvis, or around the anal area
- Perforated bowel—chronic inflammation of the intestine may weaken the wall to such an extent that a hole develops
- Malabsorption and malnutrition, including deficiency of vitamins and minerals.

Complications Outside the GI Tract

Not all complications of IBD are confined to the GI tract. For reasons that are not entirely understood, some people develop symptoms that are related to the disease but affect other parts of the body. The most common of these complications affect the skin and bones.[3] These extraintestinal complications may be evident in the:

- eyes (redness, pain, and itchiness)
- mouth (sores)
- joints (swelling and pain)
- skin (tender bumps, painful ulcerations, and other sores/rashes)
- bones (osteoporosis)
- kidney (stones)
- liver (primary sclerosing cholangitis, hepatitis, and cirrhosis)—occurs rarely

Mortality

Death due specifically to Crohn's disease or its complications is uncommon. However, people with Crohn's disease have a slightly higher overall mortality rate than the general healthy population. The increase in deaths is largely due to conditions such as cancer (particularly lung cancer), chronic obstructive pulmonary disease, gastrointestinal diseases, (both including and excluding Crohn's disease), and diseases of the genital and urinary tracts.[4]

Death due to ulcerative colitis or its complications is also uncommon. Most people with ulcerative colitis do not have a higher risk of dying from any particular disease than the general population. However, those with extensive inflammation in the colon are at higher risk than the general population for dying from gastrointestinal and lung diseases (although not lung cancer).[5]

WHO IS AT Risk?

IBD is a complex disease that results from the interaction of an individual's genes with environmental factors and the immune system.

Genetics

Scientific evidence clearly points to the role of heredity in IBD. Studies have shown that 5% to 20% of affected individuals have a first-degree relative (parent, child, or sibling) with one of the diseases.[6] Children of parents with IBD are at greater risk than the general population for developing IBD.[7] The risk is greater with Crohn's disease than with ulcerative colitis. The risk is also substantially higher when both parents have IBD. One study found that 36% of people with both parents affected developed IBD.[8]

While genetics is clearly a factor, the association is not simple. It is likely that more than one gene is at work, and just having the genes associated with IBD does not absolutely predict the disease will occur. Instead, these are susceptibility genes, which increase the chances for getting the disease. It is clear that other factors, including environmental factors, must also come into play.

Numerous genes and genetic mutations connected to IBD have been identified. The first one discovered was a mutation in the NOD2/CARD15 gene, which was found to be associated with developing Crohn's disease.[9] Up to 20% of IBD patients in North America and Europe may have a mutation in the NOD2/CARD15 gene.

While genetic testing is possible, it is not currently a part of the diagnostic process for IBD. This is because many people who carry these genes will never develop IBD. So, at this time, genetic testing can identify a potential risk for IBD in an individual, but cannot predict whether or not they will develop it.

Environmental Triggers

The environmental factors that trigger IBD are not known, but several potential risk factors have been studied.[10,11] More studies are needed to fully understand the risk factors for IBD.

- **Smoking:** Active smokers are more than twice as likely as nonsmokers to develop Crohn's disease.[12] Surprisingly, the risk of developing ulcerative colitis is decreased in current smokers compared with people who have never smoked. The numerous potential harmful health effects of smoking (e.g., cancer, heart disease) largely outweigh any benefits of smoking for people with ulcerative colitis.
- **Antibiotics:** May increase the risk for IBD.
- **Nonsteroidal anti-inflammatory drugs (aspirin, ibuprofen, naproxen):** May increase the risk for getting IBD and may cause flares.
- **Appendicitis:** Children who undergo an appendectomy (removal of the appendix) are less likely to develop ulcerative colitis later in life, but may be at a higher risk of developing Crohn's disease. However, the benefits of appendectomy in patients with severe acute appendicitis certainly outweigh the risks.
- **Diet:** IBD is not triggered by eating any one particular food. But for some people, certain foods can aggravate symptoms. The role of diet in Crohn's disease and ulcerative colitis is an important subject, and more research is needed to better understand how diet may impact these diseases.

HOW MANY ARE Affected BY THE DISEASES?

Approximately 1.6 million Americans currently have Crohn's disease or ulcerative colitis. As many as 70,000 new cases of IBD are diagnosed in the United States each year.[13]

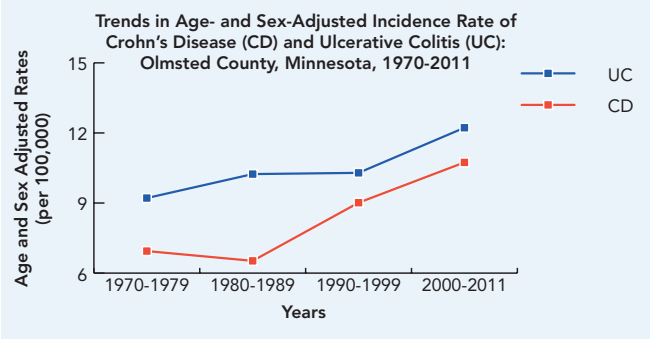


Figure 3.
Source: Loftus EV, Jr., Shivashankar R, Tremaine WJ, Harmsen WS, Zinsmeiseter AR. Updated Incidence and Prevalence of Crohn's Disease and Ulcerative Colitis in Olmsted County, Minnesota (1970-2011). ACG 2014 Annual Scientific Meeting. October 2014.

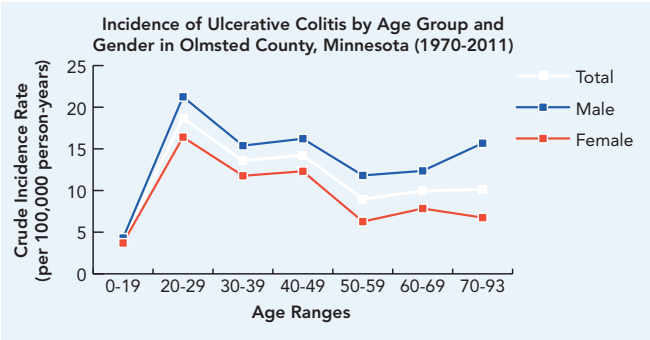


Figure 4.
Source: Loftus EV, Jr., Shivashankar R, Tremaine WJ, Harmsen WS, Zinsmeiseter AR. Updated Incidence and Prevalence of Crohn's Disease and Ulcerative Colitis in Olmsted County, Minnesota (1970-2011). ACG 2014 Annual Scientific Meeting. October 2014.

Source: Loftus, et al 2014

New cases (incidence): A population-based study conducted from 1940 to 2011 in Olmsted County, Minnesota, examined the incidence of IBD. The total number of new cases of Crohn's disease diagnosed each year (incidence) was 10.7 per 100,000 people, or approximately 33,000 new cases per year. The total number of new cases of ulcerative colitis diagnosed each year was 12.2 per 100,000 people, or approximately 38,000 new cases per year (Figure 3).

Existing cases (prevalence): Extrapolating from the Olmsted County study data to the current United States population, approximately 780,000 Americans currently have Crohn's disease and 907,000 currently have ulcerative colitis.

Age: Although Crohn's disease and ulcerative colitis can occur at any age, people are more frequently diagnosed between the ages of 15 and 35. According to the Olmsted County study, the median age of diagnosis for ulcerative colitis and Crohn's disease was 34.9 years and 29.5 years respectively (Figures 4 and 5).

Gender: In general, IBD affects men and women equally. However, most North American studies show that ulcerative colitis is more common in men than in women. In addition, men are more likely than women to be diagnosed with ulcerative colitis in their 50's and 60's (Figures 4 and 5).

Geographic distribution: IBD is found mainly in developed countries, more commonly in urban areas, and more often in northern climates. However some of these disease patterns are gradually shifting. The highest Crohn's disease incidence rate is reported in

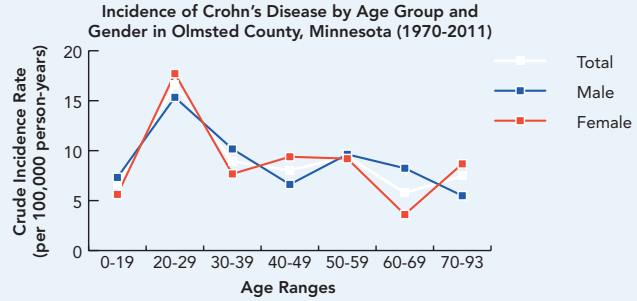


Figure 5.
Source: Loftus EV, Jr., Shivashankar R, Tremaine WJ, Harmsen WS, Zinsmeiseter AR. Updated Incidence and Prevalence of Crohn's Disease and Ulcerative Colitis in Olmsted County, Minnesota (1970-2011). ACG 2014 Annual Scientific Meeting. October 2014.

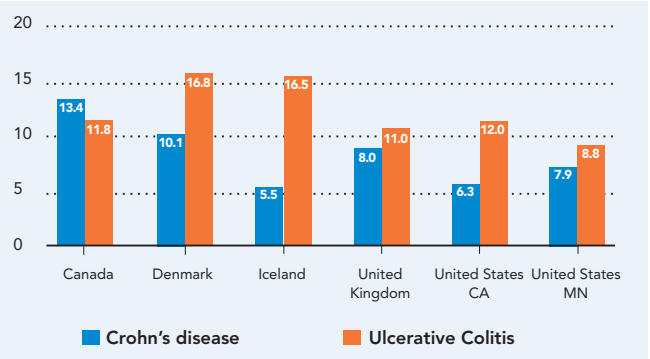


Figure 6.
Global variation in incidence rates for IBD.

Source: Talley NJ, Abreu MT, Achkar JP, et al. American College of Gastroenterology IBD Task Force. Am J Gastroenterol. 2011;106(S1):S2-S25.

Canada while the highest ulcerative colitis incidence rates are reported in Denmark, Iceland, and the United States (Figure 6). Two major epidemiological studies were conducted in the United States, one in California and the other in Minnesota. Results for both studies are included in Figure 6.

Racial and Ethnic Impacts

IBD can affect people of any racial or ethnic group. At this time, there is limited data describing the incidence and prevalence of IBD among minority patients.

One small study of IBD patients in California looked at interracial variations in disease characteristics. It included Caucasian, African American, Hispanic, and Asian subjects.[14] For example, Asians were diagnosed with IBD at older ages than Caucasians and African Americans, and Hispanics were diagnosed at older ages than Caucasians. A higher proportion of Caucasians had a family history of IBD than African Americans or Asians.

Other research shows that people of various ethnic groups who have immigrated to the United States from countries with low incidences of ulcerative colitis have higher rates of developing the disease once living in this country.[15] This suggests that race and ethnicity alone are probably not the sole determining factors, and that unexplained environmental influences are at work.

Racial Variations

Data from the Multicenter African American IBD Study and the National Institute of Diabetes and Digestive and Kidney Diseases IBD Genetics Consortium suggest that there are differences in symptoms and location of disease among racial and ethnic groups. African Americans with Crohn's disease are more likely than Caucasians to have disease in the colon or upper GI tract (esophagus, stomach, and first section of the small intestine).[16] They are also less likely to have disease in the last section of the small intestine (terminal ileum).

African Americans are also more likely to have certain extraintestinal complications, such as uveitis (swelling/irritation of the eye). Hispanics have a higher prevalence of a skin disorder called erythema nodosum (tender, red nodules beneath the skin).

Special Populations

IBD can affect men and women of all ages. For certain populations of IBD patients—such as children, women of childbearing age, and older adults—there are special considerations regarding these diseases.

Children

Most people with IBD are diagnosed after age 15. IBD can be diagnosed at a younger age, although it is rare in children younger than eight years of age. Previous studies estimate that approximately 5% of all IBD cases in the US are of pediatric age (<20 years).[17] Extrapolating from this data to current IBD trends, there may be as many as 80,000 children in the US with IBD. In children, Crohn's disease occurs twice as frequently as ulcerative colitis. Slightly more boys than girls develop IBD (especially Crohn's disease) in childhood.[18]

When IBD is diagnosed in childhood it may be more extensive and follow a more severe course than when it is diagnosed in adulthood.[19] Some children with IBD experience delayed puberty and some fail to grow at a normal rate (growth failure).[20] In approximately one-third of children with Crohn's disease and one-tenth of children with ulcerative colitis, their final adult height is less than expected because of their IBD.

Women
For women of childbearing age with IBD, there are considerations related to fertility and pregnancy. During times when the disease is in remission, women with Crohn's disease or ulcerative colitis have normal fertility rates. When the disease is active, conceiving a child may be more difficult and fertility may be affected, at least temporarily.

Some people with ulcerative colitis may need to have surgery to remove the colon and rectum. Studies show that in women who have ileoanal J-pouch surgery, fertility rates are reduced to about one-third of normal. This is thought to be due to scarring and/or blockage of the fallopian tubes from inflammation and/or postoperative surgical scarring.

Ideally, women with IBD should be in remission for six months before becoming pregnant. For women in remission or with mild disease at the time of conception, the birth will almost always be normal. The risk for complications, such as miscarriage, stillbirth, and developmental defects, is increased when the disease is active at the time of conception and during pregnancy.

Most women with Crohn's disease can deliver vaginally, but cesarean delivery may be preferred for patients with anorectal abscesses and fistulas.

Older Adults
An estimated 8% to 16% of cases of IBD are diagnosed in people 60 years of age and older. For the most part, the symptoms and features of the diseases when diagnosed in the elderly are the same as when diagnosed at a younger age. However, symptoms of diarrhea and bleeding are more likely to be present at diagnosis in older adults compared with younger IBD patients.

In addition, the diagnosis of IBD is more likely to be missed or delayed in older adults compared with younger adults.[21]

IBD patients older than 60 years experience twice as many drug-related adverse events, but the risk of steroid-associated complications is similar to those younger than age 65.[22]

Treatment

Treatment with medication is the first therapeutic option.[23] The main goals of medical treatment are to achieve remission (the absence of symptoms), maintain remission (prevent flare-ups of symptoms) and improve quality of life.

There is no standard regimen for managing all people with IBD. The approach to treatment must be tailored to the individual. Factors that determine the approach to treatment include:

- Disease severity
- Anatomic location of disease
- Previous response to medication
- Side effects of medication
- Comorbidities (other diseases or medical conditions that the person has)

Medical Treatment

There are five main categories of medications used to treat IBD:

Aminosalicylates: These are anti-inflammatory compounds that contain 5-aminosalicylic acid (5-ASA). Examples are sulfasalazine, balsalazide, mesalamine, and olsalazine. These drugs (given orally or rectally) act to decrease inflammation at the wall of the intestine. They are used primarily to treat ulcerative colitis, both to reduce symptoms and maintain remission, but may not be as effective in treating Crohn's disease.

Corticosteroids: These medications, which include prednisone, prednisolone, and budesonide, affect the body's ability to begin and maintain an inflammatory process. They keep the immune system in check. They are effective for short-term control of flare-ups. They are not recommended for long-term or maintenance use because of their side effects, which can include infection, bone loss, weight gain, cataracts, skin fragility, sleep disturbance, and mood swings.

Immunomodulators: This class of medications modifies the activity of the immune system so that it cannot cause ongoing inflammation. Examples include azathioprine, 6-mercaptopurine (6-MP), and methotrexate. These drugs are generally used to maintain remission in people who have not responded to other medications or who have only responded to steroids.

Antibiotics: The antibiotics ciprofloxacin and metronidazole have modest benefit for people with Crohn's disease that affects the colon or the area around the anus. They may be used when infections, such as abscesses, occur. There is no substantial scientific evidence to support the use of antibiotics in the treatment of ulcerative colitis.

Biologic therapies: These are the most recently developed treatments for IBD. Biologic therapies are indicated for people with moderately to severely active disease who have not responded well to conventional therapy. Four of these agents (adalimumab, certolizumab pegol, golimumab and infliximab) target an inflammatory protein called tumor necrosis factor (TNF). Natalizumab and vedolizumab work by blocking certain types of white blood cells from getting into inflamed tissues.

For the most up-to-date treatments approved for IBD, visit www.ccfa.org.

Surgical Treatment

Medication may not adequately control symptoms for everyone with IBD, and some people with these conditions develop complications that require surgery.

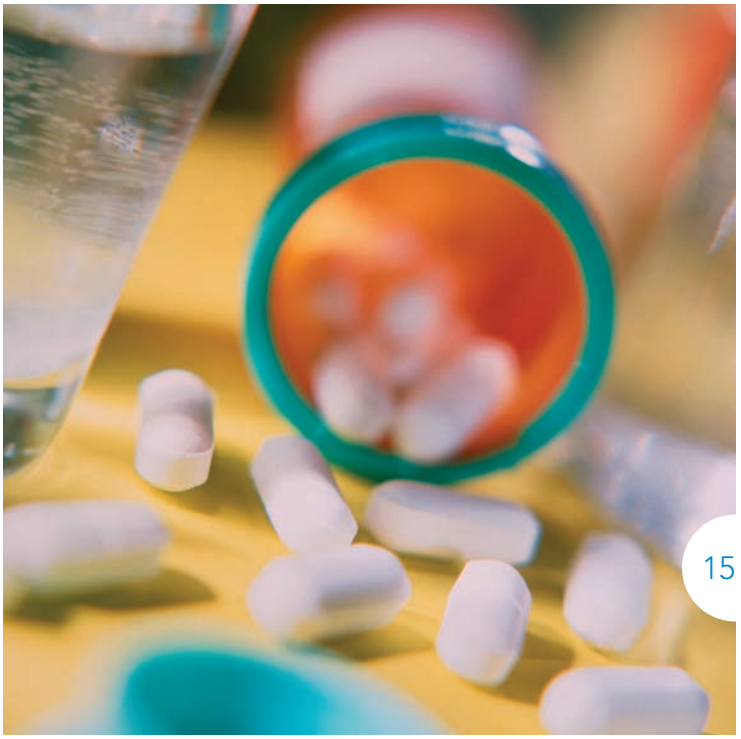
- After 30 years of disease, up to a third of people with ulcerative colitis will require surgery. The standard surgical procedure for ulcerative colitis is removal of the colon and rectum. Most patients who have surgery for ulcerative colitis can have a procedure called an ileal pouch anal anastomosis (IPAA). In this procedure, after the entire colon and rectum is removed, the small intestine is attached to the anal area, creating a pouch to collect waste. This allows the patient to pass stool through the anus. Some patients who undergo this procedure develop complications, such as pouchitis (inflammation of the pouch). Some patients will need a permanent ileostomy, where the fecal waste empties into an external bag attached to the patient's abdomen.
- About 70% of people with Crohn's disease eventually require surgery. Different types of surgical procedures may be performed for Crohn's disease, depending on the reason for surgery, severity of illness, and location of the disease in the intestines. Approximately 30% of patients who have surgery for Crohn's disease experience recurrence of their symptoms within three years and up to 60% will have recurrence within ten years.[24]

Risk of Other Diseases

IBD patients are at a slightly greater risk for some other diseases, including colon cancer, blood clots, and a liver disease called primary sclerosing cholangitis (PSC).

Risk for Cancer

People with Crohn's disease of the colon or ulcerative colitis have a higher risk for colorectal cancer than the general population. Colorectal cancer rarely occurs in the first eight to ten years after initial diagnosis of IBD. The risk increases the longer a person lives with the disease. An analysis of all published studies found that as many as 18% of people with IBD may develop colorectal cancer by the time they have had IBD for 30 years.[25] The degree of increased risk is also related to the length of colon involved and the severity of disease. Because of this increased risk, people with IBD are advised to undergo more frequent colonoscopies than the general population (every one to two years after eight years of disease). The use of certain medications for IBD may increase the risk for lymphoma (blood cancer that originates in the lymphatic system). Two studies found a three to four times increased rate of lymphoma in IBD patients taking medications that suppress the immune system, such as immunomodulators or biologic therapies.[26,27] Although this may seem alarming, the overall risk is very low; less than one percent of IBD patients taking these medications will ever develop lymphoma.



Risk for Blood Clots

People with IBD have about a three times greater risk than the general population for developing deep vein thrombosis (a blood clot that forms in a vein deep in the body) or pulmonary embolism (a blood clot causing a sudden blockage in a lung artery).[28] Hospitalized IBD patients appear to be at even greater risk. Treatment with blood thinners while in the hospital can reduce the risk of blood clots.

Risk for Primary Sclerosing Cholangitis (PSC)

PSC is a form of severe inflammation and scarring that develops in the bile ducts. About three-quarters of all PSC patients have IBD. PSC occurs more frequently in people with ulcerative colitis than in those with Crohn's disease and affects men more than women. Symptoms include jaundice, nausea, weight loss, and itching. About five percent of patients with ulcerative colitis (those with extensive disease) and one percent of patients with Crohn's disease develop this condition. The cause is not known and there is no effective medication for PSC. A liver transplant may ultimately be required.

BURDEN OF Disease

The annual financial burden of IBD in the United States may be more than $31 billion.[32, 33, 34]

Impact on Patients

Patients with Crohn's disease and ulcerative colitis can, and do, lead full and productive lives. However, when these diseases are active they can have significant impact on the quality of life for patients due to flare-ups and complications. Complications, which are described in the "Signs and Symptoms" section, can occur inside or outside the GI tract.

In Crohn's disease, a recent review of studies[29] showed that complications inside the GI tract (such as strictures) occurred in:

- up to 33% of patients at the time of diagnosis
- approximately 50% of patients within 20 years of diagnosis

In ulcerative colitis:

- 50% of patients have mild disease at the time of diagnosis
- up to 19% of patients have severe disease at the time of diagnosis
- 90% of patients have at least one relapse of active symptoms within 25 years of diagnosis

Use of the Healthcare System

People with IBD most often receive care in physicians' offices or other outpatient sites. Hospitalization is required for severe disease, to treat certain complications, and for surgery.

Crohn's Disease

- In 2004, there were 1.1 million ambulatory care visits (the number of specific disease-related visits made annually to office-based health care providers, hospital outpatient clinics, and emergency departments) for Crohn's disease.[30]
- In 2004, there were 1.8 million prescriptions written for medications to treat Crohn's disease.[30]
- In 2010, there were 187,000 hospitalizations specifically for Crohn's disease.[31]

Ulcerative Colitis

- In 2004, there were 716,000 ambulatory care visits for ulcerative colitis.[30]
- In 2004, there were 2.1 million prescriptions written for medications to treat ulcerative colitis.[30]
- In 2010, there were 107,000 hospitalizations specifically for ulcerative colitis.[31]

Psychological Health

Having a chronic illness such as IBD can be emotionally burdensome. Symptoms of IBD can flare up unexpectedly and can be painful, uncomfortable, inconvenient, and embarrassing. IBD patients may experience a wide range of emotions in response to having these conditions.

Some IBD patients react to the unpredictable and sometimes severe nature of IBD symptoms with feelings of anger, anxiety, or fear. They may also have elevated stress levels. In addition, stressful situations (even those unrelated to the disease itself) may lead to flare-ups of symptoms.

Depression is a serious disorder that can affect some people with IBD. However, depression is treatable with psychological counseling and/or antidepressant drugs. Mental health counseling and support groups can be extremely helpful in dealing with the psychological impact of IBD.

Financial Burden

There are both direct and indirect costs associated with IBD. Direct medical costs include expenses for hospitalizations, physician services, prescription drugs, over-the-counter drugs, skilled nursing care, diagnostic procedures, and other healthcare services. Indirect costs are the value of lost earnings or productivity. Indirect costs also include the value of leisure time lost.

Direct Costs

- Studies have estimated the annual direct cost of Crohn's disease to be from $8,265 per patient (based on 2003-2004 US insurance claims data)[32] to $18,963 per patient (based on 1999-2005 MarketScan database data).[33]
- Studies have estimated the annual direct cost of ulcerative colitis to be from $5,066 per patient (based on 2003-2004 US insurance claims data)[32] to $15,020 per patient (based on 1999-2005 MarketScan database data).[33]
- Extrapolating from the study data listed above to the current prevalence estimates of IBD (780,000 cases of Crohn's disease and 907,000 cases of ulcerative colitis), the total annual direct costs for all patients with IBD (both Crohn's disease and ulcerative colitis) in the United States is estimated to be between $11 billion to $28 billion.

Indirect Costs

- Based on a national health survey in 1999, nearly 32% of symptomatic IBD patients reported being out of the workforce in a one-year period, incurring an indirect cost of an estimated $5,228 per patient, bringing the total indirect cost of IBD in 1999 to $3.6 billion.[34]

Using the data listed above, the total annual financial burden (adding direct and indirect costs) of IBD in the US is an estimated $14.6 billion to $31.6 billion.

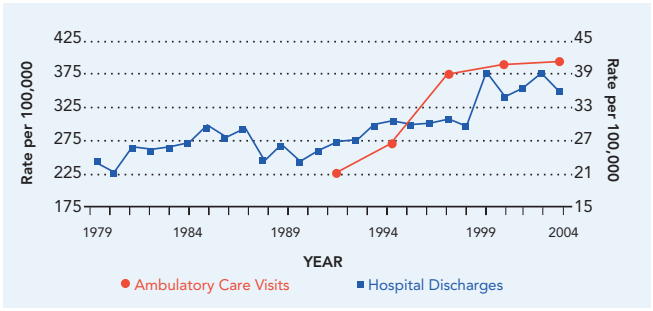


Figure 7.
Crohn's Disease: Age-Adjusted Rates of Ambulatory Care Visits and Hospital Discharges With All-Listed Diagnoses in the United States, 1979-2004.

Source: National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) (averages 1992-1993, 1994-1996, 1997-1999, 2000-2002, 2003-2005), and National Hospital Discharge Survey (NHDS)

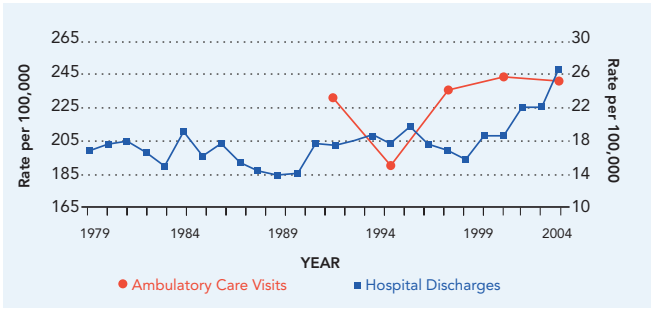


Figure 8.
Ulcerative Colitis: Age-Adjusted Rates of Ambulatory Care Visits and Hospital Discharges With All-Listed Diagnoses in the United States, 1979-2004.

Source: National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) (averages 1992-1993, 1994-1996, 1997-1999, 2000-2002, 2003-2005), and National Hospital Discharge Survey (NHDS)

WHAT WE KNOW Now

In the decades since ulcerative colitis and Crohn's disease were identified, significant scientific progress has been made in understanding these chronic inflammatory diseases. Advances in basic science (particularly immunology, genetics, and microbiology) have added to the knowledge about the causes of the diseases and have provided targets for developing new treatments.

An increasing number of susceptibility genes have been identified. The list of genes that have been found to play a role in inflammatory bowel disease is rapidly expanding (see Figure 8). In 2007, eight such genes had been identified. By 2012, that number grew to over 160 genes.

In addition, the importance of what is called the microbiome has been recognized. The microbiome comprises all the microorganisms (bacteria, viruses, fungi, and other microbes) that reside in or on the human body. The vast majority of these microorganisms are useful for maintaining good health. An important area of IBD research involves identifying the constellation of bacteria that reside in the intestines and understanding how they communicate and interact within the intestines and with the immune system.

Genes affect three types of traits:

- Balance of the immune system
- Mucosal barrier (first line of defense in the intestine)
- Controlling the growth of bacteria

A greater understanding of the underlying mechanisms of IBD has already led to the development of novel treatments, such as biologic agents used to treat people with moderate to severe Crohn's disease or ulcerative colitis. Even newer treatments have been developed which are being tested in clinical trials. New technological advances should allow research to move even faster.

Ongoing funding for research is needed. One day we will find a cure for these diseases.

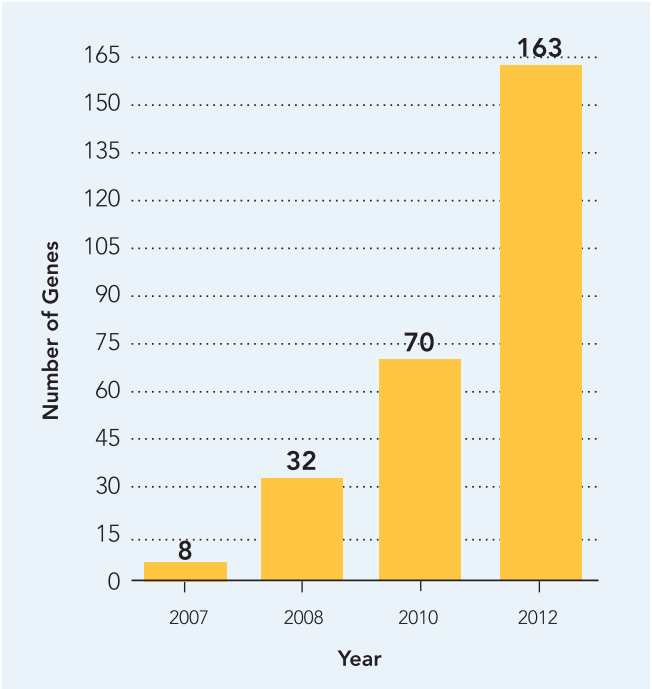


Figure 8.

A WORLD OF SUPPORT FOR Patients

No one with IBD ever has to feel isolated—the Crohn's & Colitis Foundation of America (CCFA) is dedicated to providing the support that people with IBD need to manage their disease and live full, active lives. Some of the many resources we offer include:

- **Local Chapters:** Provide educational programming, support groups, student forums, and events, serving all 50 states and the District of Columbia. Access local information by visiting our website at www.ccfa.org/chapters
- **Irwin M. and Suzanne R. Rosenthal IBD Resource Center (IBD Help Center):** Is a free service designed to provide you with disease-specific information, guidance and support. The IBD Help Center can be reached toll-free by phone at 888-MY-GUT-PAIN (888-694-8872) or through email (info@ccfa.org) Monday through Friday, 9:00 am to 5:00 pm Eastern Standard Time.
- **CCFA Website:** www.ccfa.org
- **Camp Oasis:** Co-ed residential camp program for children with IBD. www.ccfa.org/camps
- **Crohn's & Colitis Community:** Online support program www.ccfacommunity.org
- **I'll Be Determined:** Online education program www.ibdetermined.org
- **GI Buddy:** CCFA's interactive disease management tool that allows patients to manage and track all aspects of their disease, including symptoms, treatments, diet and overall well-being. GI Buddy is accessible online and as an iPhone and Android app (www.ccfa.org/gibuddy)

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CROHN'S & COLITIS
FOUNDATION OF AMERICA

733 Third Avenue
Suite 510
New York, NY 10017
212.685.3440
www.ccfa.org

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