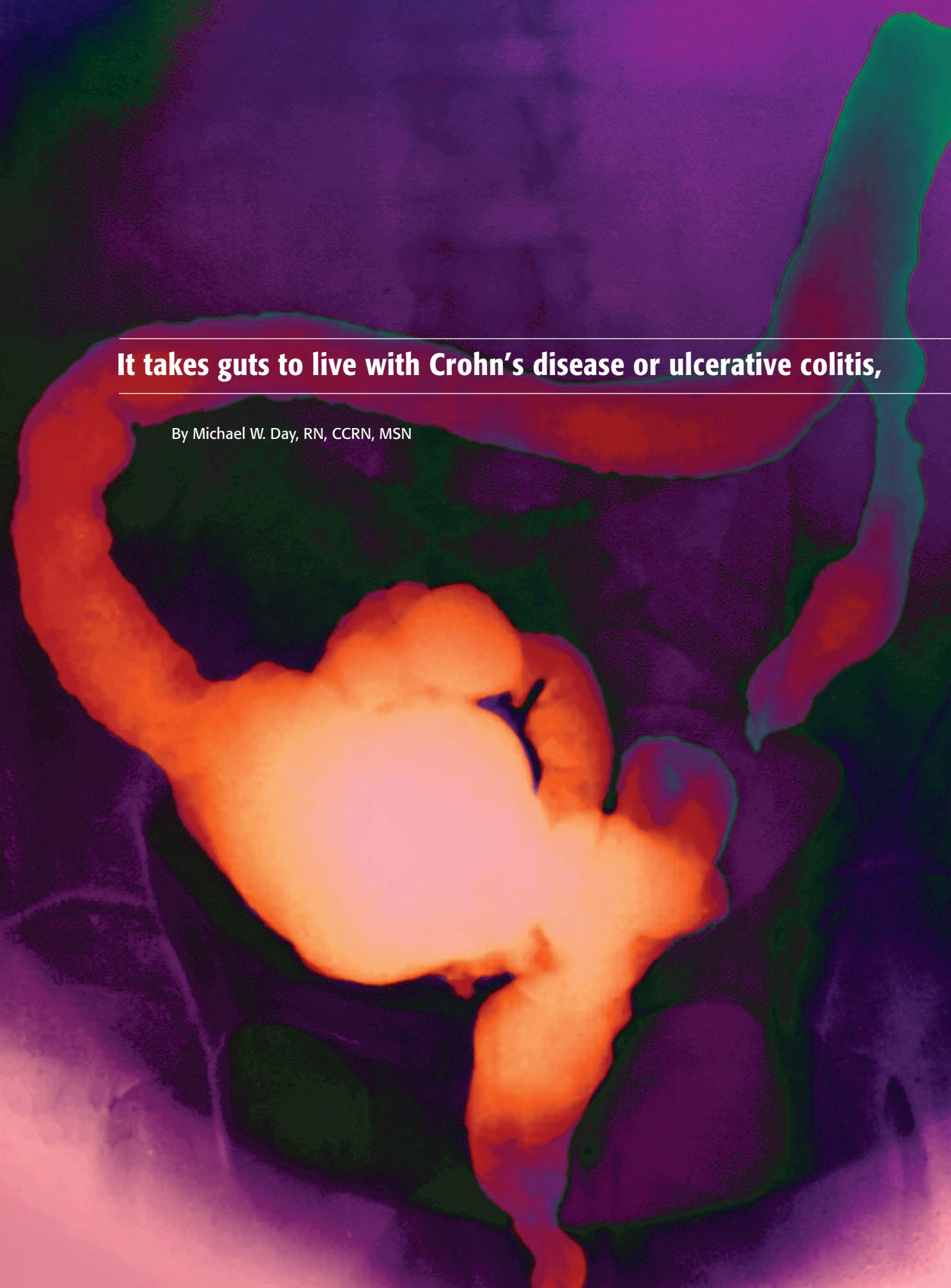
It takes guts to live with Crohn's disease or ulcerative colitis,

By Michael W. Day, RN, CCRN, MSN



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Fight back against INFLAMMATORY BOWEL DISEASE

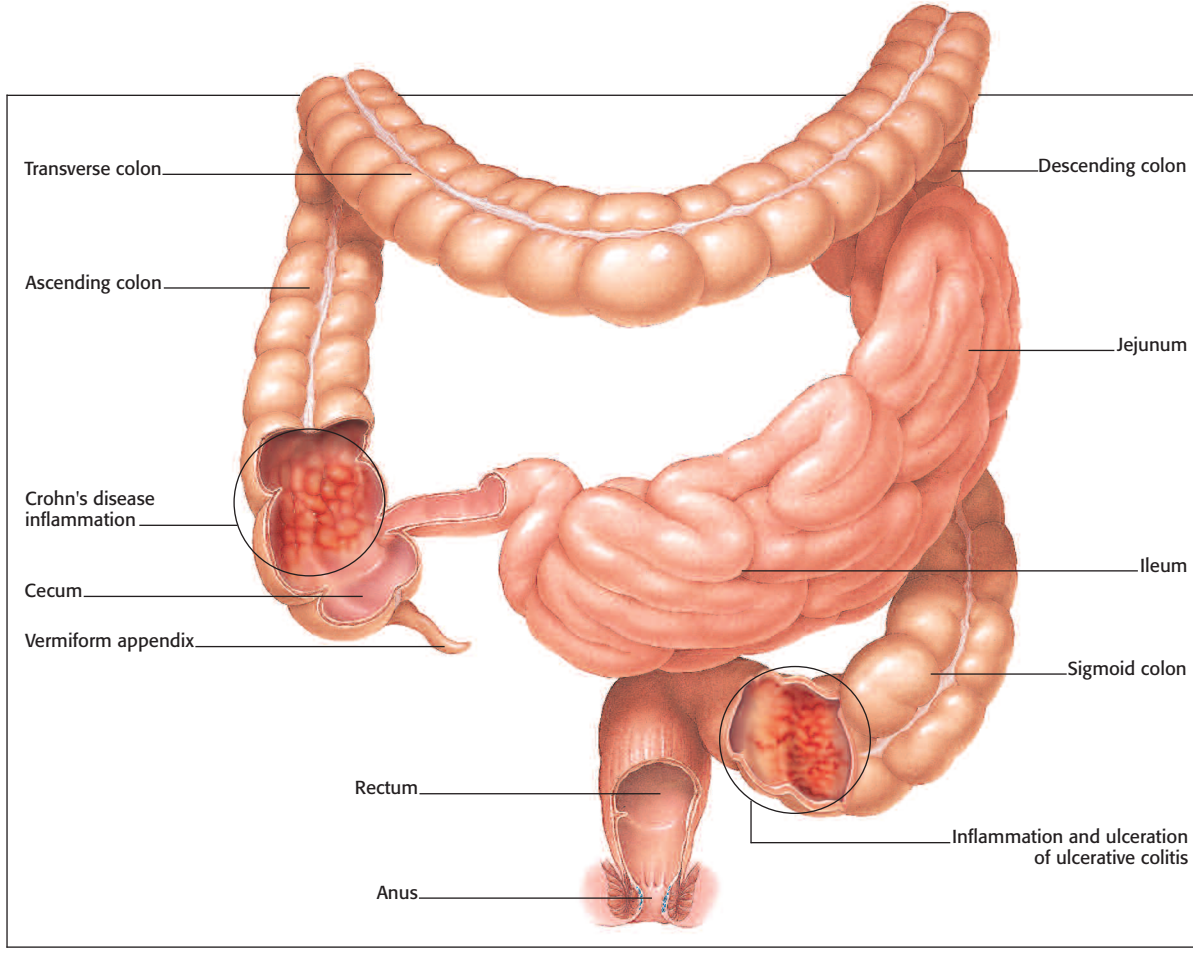
both of which can take a heavy toll on their victims. Find out how to help your patient tame the attacks.

WHEN A PATIENT is admitted to your unit with a diagnosis of inflammatory bowel disease (IBD), she has one of two disorders: Crohn's disease or ulcerative colitis. Both cause chronic diarrhea, abdominal pain, fever, arthritis of the spine and large joints of the arms and legs, and anorexia, and both can be extremely debilitating, even life-threatening. But they're not the same disease, and you must understand the difference to intervene appropriately. In this article, I'll discuss the similarities and differences, including diagnostic tests and treatments for each and what nursing care and teaching you must be prepared to provide for your patient after the diagnosis.

Similar but not the same

Crohn's disease and ulcerative colitis are classified as IBD because they're characterized by chronic inflammation at various sites in the gastrointestinal (GI) tract. The inflammation usually causes diarrhea and abdominal pain. Both types of IBD are chronic, wax and wane in severity, and can cause signs and symptoms in other parts of the body. However, ulcerative colitis, which is confined to the colon, can be cured by removing the colon. Because Crohn's disease can affect the entire GI tract, it's considered manageable but incurable.

Both types of IBD can strike at any age but most patients first experience problems between ages 10 and 30, with a smaller peak incidence between ages 50 and 60. The risk is higher among white patients compared with nonwhites and among Jewish patients com-



pared with those with a non-Jewish background. Both diseases have a familial tendency: 10% to 20% of patients with IBD have at least one relative who also has IBD.[1] Research indicates that both diseases stem from dysfunction of the epithelial cells in the GI tract and that a distinct immunologic process is responsible.[2]

Although no single feature absolutely distinguishes Crohn's disease from ulcerative colitis, the disorders generally differ in several ways. For example, ulcerative colitis is usually confined to the rectum and lower colon, with inflammation limited to the intestinal wall's inner lining. In contrast, Crohn's disease typically affects the lower part of the small bowel (ileum) but may extend throughout the GI tract. In addition, inflammation can affect all layers of the intestinal wall.[1] (See *How Crohn's disease and ulcerative colitis compare* for more distinguishing features.) In the few patients in whom the disease can't be differentiated, the diagnosis is indeterminate colitis.

Precise causes of IBD aren't well understood, although an induced immune reaction in people with a genetic predisposition is probably involved.[2] Possible triggers for the immune reaction include diet, environment, and infection. For unknown reasons, smoking increases the risk of Crohn's disease but decreases the risk of ulcerative colitis.[1,3] For more about IBD risk factors, see *What increases the risk of IBD?*

Beyond the GI tract

The underlying inflammation of IBD can lead to disorders elsewhere in the body. For example:

- erythema nodosum causes tender, erythematous nodules, most often on the ankles or shins
- pyoderma gangrenosum, a painful and progressive destructive skin disorder, is characterized by deep skin ulceration
- peripheral arthritis in large joints may or may not involve joint swelling and redness
- stomatitis.

These disorders tend to flare and resolve along with IBD attacks. Other syndromes that may be related to IBD but don't coincide with exacerbations include uveitis, ankylosing spondylitis, and primary sclerosing cholangitis (PSC), a chronic liver disease involving inflammation and scarring of the bile ducts. In fact, PSC may precede the diagnosis of IBD by years and always merits an investigation for IBD. Patients with IBD also have a greater incidence of thromboembolic events and may develop abnormal liver function tests, indicating liver disease.[4]

Nutritional deficiencies are a particular problem in IBD, especially in Crohn's disease. Loss of appetite, malabsorption of nutrients, increased calorie requirements, loss of electrolytes and protein, and the effects of therapy contribute to nutritional deficiencies.

Now let's take a closer look at each disorder, starting with Crohn's disease.

Crohn's disease: "Skip" the lesions

Although Crohn's disease can involve the entire GI tract, only rarely does it

How Crohn's disease and ulcerative colitis compare

	Crohn's disease	Ulcerative colitis
Usual lesion site	Primarily the ileum, but may extend into the colon or affect the entire GI tract	Limited to rectum and left colon
Type of lesions	Intermittent granulomatous skip lesions with healthy tissue in between	Continuous ulcerative and exudative lesions
Tissue involvement	May involve all layers of the intestinal wall	Mucosal layer only, unless disease is severe
Rectal bleeding	Unusual unless colon is involved	Common
Fistulas and abscesses	Common	Rare
Cancer development	Uncommon	Fairly common

Source: Porth CM. *Essentials of Pathophysiology: Concepts of Altered Health States.* 2nd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2007.

affect the esophagus, stomach, or duodenum. However, mouth ulcers are common. The most common complication is intestinal obstruction.[3]

Crohn's disease is characterized by well-demarcated lesions, called "skip" lesions, surrounded by tissue that appears normal. The lesions penetrate the bowel's submucosal layer but don't usually extend to bowel muscle.

As Crohn's disease progresses, the affected portion of the bowel becomes semirigid and thickened. Chronic inflammation causes hypertrophy of bowel muscle, leading to fibrosis and strictures. All these changes can lead to abscesses, fistulas, and bowel obstruction.

About 30% of patients with Crohn's disease develop fistulas, usually in high-pressure areas just proximal to strictures. These may penetrate nearby structures, including the bladder, other bowel loops, or muscle, and become infected. An enterocutaneous fistula may extend out of the abdominal cavity, causing bowel contents to leak through a skin opening. Most fistulas occur in the perianal area.[5]

Signs and symptoms of Crohn's disease vary, depending on how long the patient has had the disease. Initial symptoms may be mistaken for appendicitis or bowel obstruction. The patient may initially report fever, persistent diarrhea, and cramping abdominal pain. When disease is confined to the small bowel, the patient will pass larger volume stools without urgency or tenesmus (ineffectual straining to pass stool). Rectal bleeding, although less common, can occur if he has lesions in the colon.

Pain related to abscesses, obstruction, or adhesions from previous surgeries is common as the disease progresses; draining fistulas are less common. Other common signs and symptoms include fever, weight loss, and various non-GI syndromes.

Malnutrition results from the disease itself, which destroys healthy bowel tissue, and the surgery that some patients require. Removing a significant portion of the small bowel leads to malabsorption, typically causing deficiencies in electrolytes, minerals, fat-soluble vitamins, and vitamin B_{12}. These deficiencies can lead to clotting disorders, bone demineralization, and delayed growth and development in children. The degree of malabsorption is usually related to the extent of small-bowel involvement.

Pinning down the diagnosis

Crohn's disease mimics many other disorders, and no single test is diagnostic. The healthcare provider will rely on the patient's history and results of various tests to rule out other disorders, such as diverticulitis or appendicitis, and make the diagnosis.

- *Lab studies* include a complete blood cell count, which may reveal anemia and leukocytosis; liver function tests; and a basic metabolic panel. Inflammatory markers, such as erythrocyte sedimentation rate and C-reactive protein, and nutritional markers, such as albumin, prealbumin, and transferrin, help the healthcare provider monitor disease progress.
- *Imaging studies* commonly include plain abdominal X-rays and computed tomography or magnetic resonance imaging of the abdomen. In women, ultrasound of the abdomen and pelvis may be indicated to rule out gynecologic problems.
- *Endoscopy* allows the clinician to visualize lesions in the colon up to the terminal ileum and remove specimens for biopsy.
- *Capsule endoscopy*, a newer procedure, may provide better images of the small intestine. The patient swallows a capsule containing a tiny camera, which radios data to a sensor as it passes through the GI tract.[6]
- *Barium contrast studies*, such as an upper GI series, can help define the distribution and severity of disease. A barium enema may be indicated when diarrhea is the primary symptom, indicating greater colon involvement.

Managing Crohn's disease with medication

Although Crohn's disease isn't curable, various interventions can help the

patient cope with debilitating signs and symptoms. For example, cautious use of the antidiarrheal loperamide, taken just before meals, can help him manage cramping and diarrhea. Bulking laxatives (psyllium [Metamucil]) increase stool firmness and may help prevent anal irritation from diarrhea.[4] However, these drugs mustn't be used when Crohn's disease affects the colon because they could trigger toxic megacolon, a potentially life-threatening condition (see *Toxic megacolon takes a toll* for details).

For more about drugs commonly prescribed to manage Crohn's disease, see *Managing IBD medically*.

Surgical options

Up to 75% of patients with Crohn's disease undergo some type of surgery, usually to remove lesions. However, surgery is never the first choice because it doesn't cure the disease. About 50% of patients experience a recurrence of symptoms within 5 years, and about half of these need more surgery. But long-term drug therapy following surgery may help maintain remission.[7]

If the patient develops a bowel obstruction, he'll be treated initially with gastric suctioning, I.V. fluids, and possibly parenteral nutrition (PN). Obstructions associated with Crohn's disease generally resolve within days, but if they don't, surgery is usually indicated.

If the patient develops significant fever and vomiting, rebound tenderness, or a palpable abdominal mass, he also needs hospital admission for treatment with I.V. fluids and antibiotics and drainage of abscesses, if present. Once infection is ruled out or controlled, he may begin corticosteroid therapy. If he doesn't respond within a week, surgery is usually indicated.

A patient who develops perianal fistulas may need a temporary diverting colostomy, but fistulas almost always recur when the colostomy is reversed. For this reason, a diverting colostomy is used as a temporary measure until definitive surgery can be done to resect the colon.

Toxic megacolon takes a toll

When the colon dilates to a diameter greater than 6 cm in a short time (usually 1 to 2 days), the patient has toxic megacolon, a life-threatening complication of IBD. Use of antidiarrheal drugs to significantly decrease GI motility sometimes precipitates this complication. Signs and symptoms include abdominal pain, tenderness, and distension; dehydration; fever; and tachycardia. Potentially fatal consequences of toxic megacolon include perforation, sepsis, shock, and systemic inflammatory response syndrome.

Treatment for toxic megacolon associated with IBD includes I.V. corticosteroids, placement of a long intestinal tube, fluid and electrolyte replacement, and antibiotics. The healthcare provider may consider placing a soft rectal tube to decompress the colon, but he must use extreme caution to avoid perforating friable tissue. If the patient doesn't respond to conservative treatment in 24 to 48 hours, he'll need a colectomy to save his life.

Ulcerative colitis: Confined to the colon

Although a few patients recover completely after one episode, ulcerative colitis is usually chronic and characterized by remissions and exacerbations. The course and severity vary widely, from relatively benign to severely debilitating. The risk of colon cancer increases with the length of time a patient has ulcerative colitis and the amount of bowel involved.

Unlike Crohn's disease, ulcerative colitis is confined to the large bowel, with lesions usually developing initially in the rectum. And unlike the skip lesions of Crohn's disease, the lesions of ulcerative colitis are continuous. Typically they affect only the mucosa (inner lining of the intestinal wall), but they may extend into the submucosal muscle layer in severe disease.[2]

In the early stages of ulcerative colitis, mucosa is edematous and friable with areas of bleeding. As the disease progresses, the lesions produce large amounts of purulent drainage. If lesions extend into the muscle layer, the bowel loses tone and begins to dilate, raising the risk of toxic megacolon.

Classic signs of ulcerative colitis

Intermittent bouts of bloody diarrhea between periods of normal bowel movements is a classic sign of ulcerative colitis. Tenesmus is common. The frequency of signs and symptoms varies with disease severity.

- With *mild disease,* the patient may have normal stools yet leak blood, mucus, and pus with or between bowel movements. He may also have mild cramping, urgency, and diarrhea.
- A patient with *severe disease* may have 30 to 40 bowel movements a day, primarily watery stool with significant amounts of blood, mucus, and pus. Diarrhea attacks are commonly accompanied by fever, abdominal pain, and cramping. Some patients lose so much blood that they become anemic. Nighttime diarrhea may interrupt sleep and further debilitate the patient. Diarrhea also causes significant electrolyte imbalances, particularly hypokalemia.
- *Fulminant colitis,* in which ulcerative colitis lesions penetrate the bowel muscle, is characterized by sudden, violent diarrhea with rebound tenderness, abdominal pain, and toxemia. Some patients have these signs and

What increases the risk of IBD?

Inflammatory bowel disease is considered primarily an immune system disorder with a strong genetic component. Having a relative with IBD increases the risk by about 10 times; the risk is 30 times greater if the relative is a brother or sister.[6] Psychological factors, although probably not a direct cause, can contribute to the onset and severity of IBD. These factors may also influence disease development:

- *Smoking* increases the risk of Crohn's disease but decreases the risk of ulcerative colitis. [1,3]
- *Breast-feeding* decreases the child's future risk of both Crohn's disease and ulcerative colitis.[10]

symptoms during the initial episode of the disease. Fulminant colitis may also cause toxic megacolon or bowel perforation.

Along with acute signs and symptoms, ulcerative colitis may cause weight loss, malaise, fever, anemia, and anorexia. Other parts of the body are also affected by flares (disease exacerbations), so the patient may develop arthritis or a skin condition such as erythema nodosum.

Testing for ulcerative colitis

For a definitive diagnosis of ulcerative colitis, many other conditions must be ruled out. Diagnostic testing is similar to that for Crohn's disease.

- *Lab studies.* A complete blood cell count and albumin and basic metabolic panel are useful to evaluate the patient's overall health. Anemia may point to intestinal bleeding. Stool samples for culture and sensitivity and tests for ova and parasites and *Clostridium difficile* toxin help rule out other causes of diarrhea.
- *Endoscopy and biopsy.* Because ulcerative colitis usually develops first in the rectum, the healthcare provider may start with a sigmoidoscopic examination. If lesions extend beyond the left colon, he may perform a colonoscopy. Collecting tissue samples for biopsy may help identify the cause of lesions.
- *Imaging studies.* Endoscopy and biopsies typically eliminate the need for plain abdominal X-rays, although X-rays may help the healthcare provider identify large accumulations of gas or toxic megacolon. He may also order a barium enema study to outline lesions.

A word of warning: Endoscopy and barium enemas are contraindicated in patients with toxic megacolon because these procedures could cause perforation.

Treatment options for ulcerative colitis

As with Crohn's disease, medical management of ulcerative colitis aims to establish and maintain disease remission. See *Managing IBD medically* for details on drug therapy to manage flares and maintain remission.

From 25% to 35% of patients with ulcerative colitis may require some type of surgery.[8] The reasons include cancerous lesions, strictures, complications such as toxic megacolon, or recurrent and severe signs and symptoms that cause significant hardship for the patient. Unlike surgery for Crohn's disease, proctocolectomy (removal of the rectum and colon) cures ulcerative colitis.

Here's a quick look at two widely used surgical options.[9]

Proctocolectomy with ileostomy. After removing the colon, rectum, and anus, the surgeon creates a stoma in the abdominal wall. Intestinal waste drains from the end of the ileum through the stoma into an ostomy pouch.

Restorative proctocolectomy. If the patient isn't critically ill and his anal sphincter is free from lesions, the surgeon may remove the colon and rectum but leave the anus intact. He then forms an internal pouch from the distal ileum and connects it to the anal sphincter, allowing the patient to have continent bowel movements. (This option usually requires two surgical procedures.) After healing in about 12 months, the typical patient will have five or six bowel movements a day but remain continent.

Up to 30% of patients who have this procedure develop pouchitis (inflammation of the ileal pouch), which is treated with an antibiotic such as ciprofloxacin or an antiprotozoal such as metronidazole. If inflammation persists, the ileal pouch may be converted to another type of ileal diversion, such as a Kock pouch or ileostomy. Small-bowel obstruction, a less common complication, usually responds to bowel rest and conservative treatment, but some patients require surgery to remove the blockage.[8]

If necessary to treat massive hemorrhage or perforation, the surgeon may perform a subtotal colectomy with an ileostomy and a mucous fistula. (The remaining colon is attached to the anus.) This is a relatively quick intervention to treat an acute, life-threatening complication. Later, the surgeon will perform definitive surgery, removing the rectal stump to prevent recurrence of ulcerative colitis or cancer.[4]

When your patient has an ileostomy, he continues to lose fluid and electrolytes. Without the colon, his body can't reabsorb GI fluids, and the ileostomy effluence is very watery with a high concentration of electrolytes. Over time, however, the GI tract becomes more efficient at absorbing water and electrolytes.

Nursing considerations for IBD

When you care for a patient with Crohn's disease or ulcerative colitis, use the following measures to help

manage his signs and symptoms, monitor for complications, and promote healing and well-being.

Manage the effects of diarrhea. For most patients, diarrhea is the worst symptom of IBD. Perform these measures and teach your patient how to do them at home: Thoroughly clean the rectal area after each bowel movement to decrease pain and skin irritation, using nonirritating cleansers and wipes. Apply a barrier cream after cleaning to help protect sensitive skin. If the perianal skin is damaged, apply a rectal pouch to protect it from contact with stool.

Limit activity. Encourage the patient to take intermittent rest breaks during the day to conserve energy. During acute attacks, curtailing activity will decrease gut motility.

Monitor stool. Monitor the amount, consistency, and color and assess it for blood. Tell the patient to report changes to his healthcare provider.

Monitor fluid and electrolyte levels. Diarrhea can cause large losses of fluids and electrolytes, so routinely monitor the patient's fluid status and evaluate lab results.

Manage your patient's pain. Assess pain using a valid and reliable pain intensity rating scale. Changes in the nature or intensity of pain may indicate a worsening condition, so report them immediately; your patient's treatment plan may need to change dramatically. Administer pain medications as scheduled, assessing the nature and intensity of pain beforehand and afterward. Opioid medications are usually used sparingly because they increase the risk of toxic megacolon.

Provide postoperative care. If your patient's colon has been removed but the rectal stump remains, he'll have an ileostomy and a mucous fistula. If the rectum and anus are also removed, he'll have an ileostomy alone. In both cases, frequently monitor the stoma, which should be red and moist but not painful. A dusky appearance, cyanosis, or pallor indicates compromised blood supply. Monitor the stoma output for color, consistency, and amount. Assess the patient for abdominal pain or distension, indicating possible ileus. Finally, when his nasogastric tube is removed, slowly advance his diet as ordered.

Provide nutritional support. The patient needs nutritional support to help reverse wasting from IBD. If he has mild disease, he may get adequate nutrition from a low-fat diet supplemented with vitamins and minerals while he undergoes medical treatment.

A patient who's undergone surgery or who has severe disease may require PN. While on PN, he may also receive enteral feedings at 5 to 10 mL/hour to continue nutrition to his small bowel. As he's slowly weaned from PN, gradually increase his enteral feedings. Consult with a dietitian as indicated.

Help the patient adapt. Because of body image changes, chronic diarrhea, and other persistent problems, most patients with IBD have significant psychosocial issues. Many patients say that fecal incontinence (or fear of it) is the most limiting aspect of the disease.

Managing IBD medically

The goal of treatment for IBD is to establish and maintain remission. A low-fiber diet may help the patient prevent or manage diarrhea. If his IBD affects the colon, warn him not to use antidiarrheal medications because of the risk of triggering toxic megacolon.

Drugs in the following categories are mainstays of treatment for IBD.

- ***Aminosalycilates***, which contain the compound 5-aminosalicyclic acid (5-ASA), reduce inflammation in the GI tract. Examples include sulfasalazine and mesalamine, which are available in oral formulations; mesalamine is also available in enema and suppository form for treating inflammation in the rectum and lower colon. Numerous but infrequent adverse reactions, including nausea, fatigue, and headache, limit the usefulness of this treatment for some patients. But if the patient responds to therapy and tolerates it well, he may continue on maintenance therapy to prolong remission.
- ***Antibiotics*** may be prescribed initially, depending on signs and symptoms, or later if the patient fails to respond to several weeks of treatment with 5-ASA. If he has recurrent fistulas or abscesses, he may continue to take an antibiotic such as ciprofloxacin as long-term therapy.
- ***Corticosteroids*** such as prednisone and methylprednisolone are another option if the patient doesn't respond to 5-ASA or has significant pain, fever, or vomiting. These drugs, which help reduce inflammation, are usually given orally but are also available as enemas and suppositories. Generally they're used to manage disease flares, not as maintenance therapy. But budesonide (Entocort EC), a newer corticosteroid approved to treat mild to moderate Crohn's disease, may be continued for up to 3 months to maintain remission.
- ***Immunomodulators*** such as azathioprine, 6-mercaptopurine, or methotrexate help reduce immune system activity. Associated with fewer adverse reactions than corticosteroids, they may be used to maintain remission.
- ***Biologic response modifiers*** such as infliximab (Remicade), adalimumab (Humira), and certolizumab (Cimzia) block tumor necrosis factor, a component of the inflammatory response. Given by I.V. infusion, these drugs help control inflammation, trigger remission, and allow fistulas to close. Although generally well tolerated, they may cause infusion reactions, malignancies, and potentially serious infections (see "TNF blockers: Stronger labeling warns of fungal infections" in *Drug News* on page 14 of this issue). Because of these risks, they're generally reserved for patients who haven't responded well to other therapies.

Altered body image is a significant issue with anyone who has an ostomy. As soon as possible, show the patient his stoma and the associated equipment so he can begin to integrate it into his body image. Use proper terms to describe anatomy and the stoma equipment and encourage him to help with stoma care. Provide care in an open, accepting manner and encourage the patient and his family to express their feelings about the stoma.

Provide your patient and his family with resources so they realize they aren't alone in dealing with IBD. They can find resources at the Crohn's and Colitis Foundation (http://www.ccfa.org in the United States and http://www.ccfc.ca in Canada).

Living with IBD

By understanding IBD and the measures needed to manage its various manifestations, you're better prepared to help him through disease exacerbations and live more comfortably with his disease. ✧

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Fight back against inflammatory bowel disease

GENERAL PURPOSE To provide nurses with an overview of Crohn's disease and ulcerative colitis. **LEARNING OBJECTIVES** After reading the preceding article and taking this test, you should be able to: **1.** Describe the pathophysiology of IBD. **2.** Identify clinical manifestations of IBD. **3.** State management strategies for a patient with IBD.

1. Unlike Crohn's disease, ulcerative colitis
a. doesn't cause bloody diarrhea.
b. is curable.
c. typically affects only the small bowel.
d. has no familial tendency.

2. Which ethnic group is at highest risk for IBD?
a. African-American
b. Hispanic
c. Asian
d. white

3. Ulcerative colitis is usually confined to the
a. ileum.
b. cecum.
c. duodenum.
d. rectum and lower colon.

4. Ulcerative colitis usually affects which layer of the intestinal wall?
a. inner
b. middle
c. outer
d. all layers

5. Which trigger increases the risk of Crohn's disease but not ulcerative colitis?
a. infection
b. diet
c. smoking
d. environment

6. IBD can cause tender nodules appearing most often on the
a. elbows.
b. ankles.
c. hands.
d. neck.

7. The most common complication of Crohn's disease is a(n)
a. abscess.
b. esophageal stricture.
c. intestinal obstruction.
d. fistula.

8. A common initial symptom of Crohn's disease is
a. persistent diarrhea.
b. rectal bleeding.
c. myalgia.
d. arthralgia.

9. Malnutrition results from Crohn's disease's effect on the
a. small bowel.
b. cecum.
c. ascending colon.
d. sigmoid colon.

10. Which blood test best monitors nutritional status in a patient with Crohn's disease?
a. electrolytes
b. C-reactive protein
c. erythrocyte sedimentation rate
d. transferrin

11. Which test may be indicated when diarrhea is the primary symptom?
a. computed tomography
b. ultrasound
c. capsule endoscopy
d. barium enema

12. When Crohn's disease affects the colon, don't give
a. 5-ASA.
b. bulking laxatives.
c. parenteral lipids.
d. oral potassium.

13. Which is considered definitive treatment for perianal fistulas?
a. daily laxatives
b. colon resection
c. temporary colostomy
d. daily enemas

14. Which sign or symptom is common in ulcerative colitis but not Crohn's disease?
a. fever
b. diarrhea
c. tenesmus
d. abdominal pain

15. The percentage of ulcerative colitis patients requiring surgery is approximately
a. 30%.
b. 50%.
c. 60%.
d. 80%.

16. In most ulcerative colitis patients, removing the rectum and colon results in
a. small-bowel obstruction.
b. toxic megacolon.
c. pouchitis.
d. cure.

17. Activity during an acute attack of IBD should be
a. avoided.
b. curtailed.
c. increased.
d. strenuous.

18. Which pain medication should be used sparingly for IBD?
a. corticosteroids
b. acetaminophen
c. opioids
d. aminosalicylates

19. A healthy stoma should appear
a. dusky.
b. moist.
c. pale.
d. cyanotic.

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State of license (1) _____ License # _____
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❑ Please fax my certificate to me.
❑ From time to time, we make our mailing list available to outside organizations to announce special offers. Please check here if you do not wish us to release your name and address.

B. Test Answers: Darken one circle for your answer to each question.

	a	b	c	d
1.	❍	❍	❍	❍
2.	❍	❍	❍	❍
3.	❍	❍	❍	❍
4.	❍	❍	❍	❍
5.	❍	❍	❍	❍
6.	❍	❍	❍	❍
7.	❍	❍	❍	❍
8.	❍	❍	❍	❍
9.	❍	❍	❍	❍
10.	❍	❍	❍	❍
11.	❍	❍	❍	❍
12.	❍	❍	❍	❍
13.	❍	❍	❍	❍
14.	❍	❍	❍	❍
15.	❍	❍	❍	❍
16.	❍	❍	❍	❍
17.	❍	❍	❍	❍
18.	❍	❍	❍	❍
19.	❍	❍	❍	❍

C. Course Evaluation*
1. Did this CE activity's learning objectives relate to its general purpose? ❑ Yes ❑ No
2. Was the journal home study format an effective way to present the material? ❑ Yes ❑ No
3. Was the content relevant to your nursing practice? ❑ Yes ❑ No
4. How long did it take you to complete this CE activity?___ hours___minutes
5. Suggestion for future topics _____

D. Two Easy Ways to Pay:
❑ Check or money order enclosed (Payable to Lippincott Williams & Wilkins)
❑ Charge my ❑ Mastercard ❑ Visa ❑ American Express

Card # _____ Exp. date _____

Signature _____

*In accordance with the Iowa Board of Nursing administrative rules governing grievances, a copy of your evaluation of the CE offering may be submitted directly to the Iowa Board of Nursing.

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