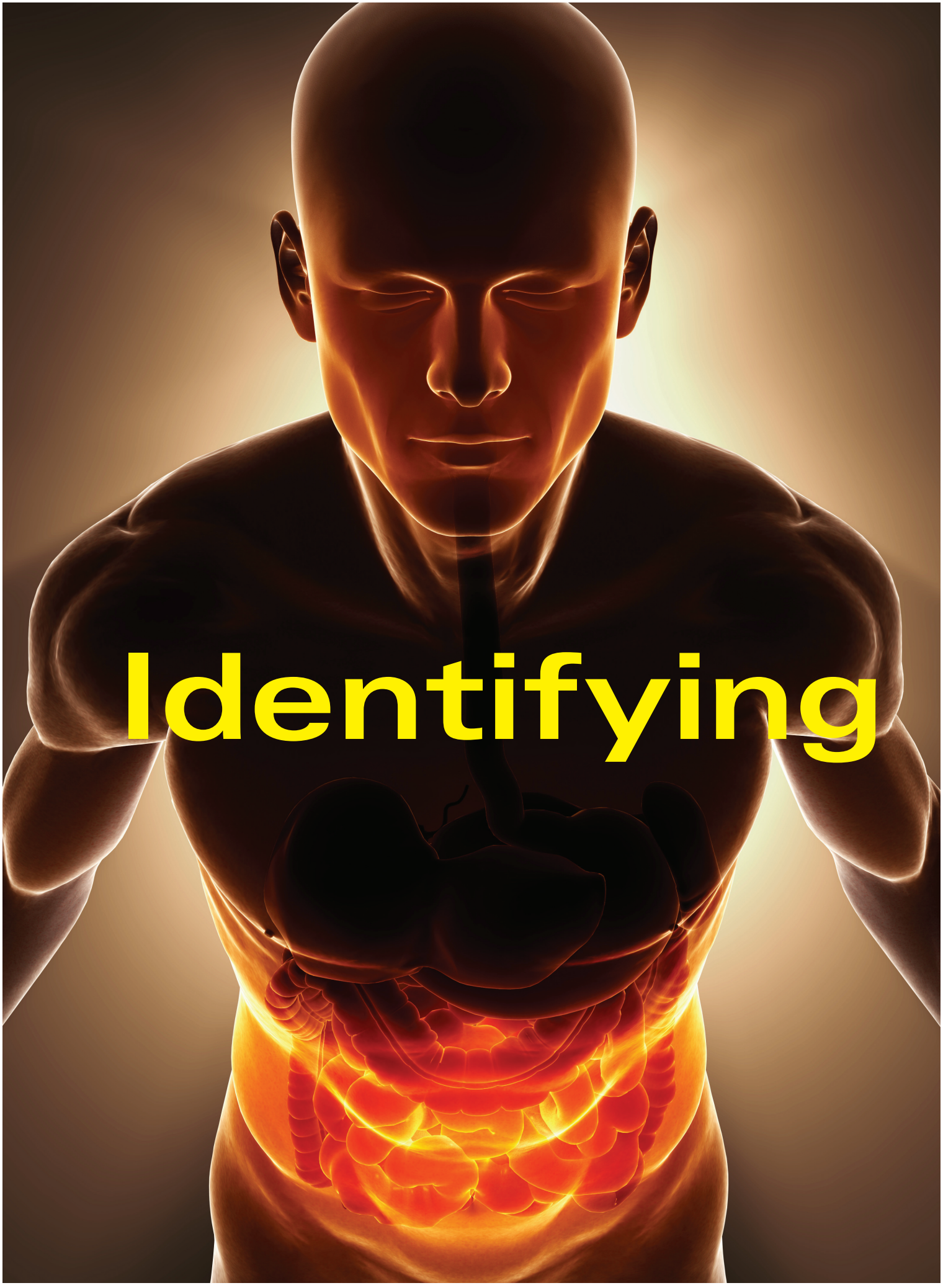
Identifying

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intestinal obstruction

Better safe than sorry

By **Susan M. Goldberg**, RN, CNOR, BS

Delineated as a blockage of either the small or large intestine, intestinal obstruction is an acute condition. Every year, at least 1 in 1,000 patients is diagnosed with this condition.[1] Intestinal obstruction may be categorized as mechanical or nonmechanical, and can lead to perforation of the bowel, sepsis, or electrolyte imbalances.[2] Moreover, a lack of sufficient blood supply to the intestine can result in bowel infarction.[2] Intestinal obstruction must be addressed as soon as it's diagnosed because the condition often rapidly develops into an emergency situation.[3]

Anatomy

The digestive tract extends from the mouth to the anus, and is approximately 7.6 to 9.1 meters long.[4] Included within this tract is the gastrointestinal (GI) tract, comprised of the esophagus, stomach, and the small and large intestine. Accessory organs of the GI system include the liver, pancreas, and gall bladder.

The stomach is a pouchlike structure that serves as a temporary storage area for food during the early stages of digestion. The stomach breaks down food into absorbable components and moves the contents to the small intestine, where they combine with pancreatic secretions and bile from the liver. Almost all food nutrients are absorbed into the bloodstream via the small intestine. The large intestine joins the small intestine at the ileocecal junction, where unabsorbed products from the small bowel—including water, fiber, and electrolytes—pass into the large intestine. The body receives 90% of the liquid from digestion from the large intestine, which provides sodium and water to the rest of the body. As this fluid is removed from the bowel, the solid waste remains to be expelled. (See Organs of the GI system.)

Mechanical obstructions

A mechanical bowel obstruction is defined as a partial or complete blockage of the intestine. These obstructions can occur in either the small or large bowel, arise in all ages and genders, and are triggered by the following:[3]

Adhesions. These account for 50% to 70% of all intestinal obstruction cases.[1] Some adhesions are congenital, while some are caused by prior abdominal surgery. Composed of tough bands of tissue, adhesions can connect intestines to each other or to adjacent organs. In some cases, this tight, fibrous tissue drags the intestines out of place, where they can become blocked or twisted.

Hernias. These occur when the muscle wall, which holds the internal organs in place, weakens or tears. The danger of an untreated hernia occurs if part of the intestine protrudes through this weakened area. In some cases, it might be possible for the healthcare provider to manually push the intestine back into the abdominal cavity, but it's only a temporary fix. If the intestine becomes incarcerated, the blood supply to the bowel is diminished, leading to ischemia or necrosis. Gangrene and bowel perforation are serious complications that can lead to infection and death.[5]

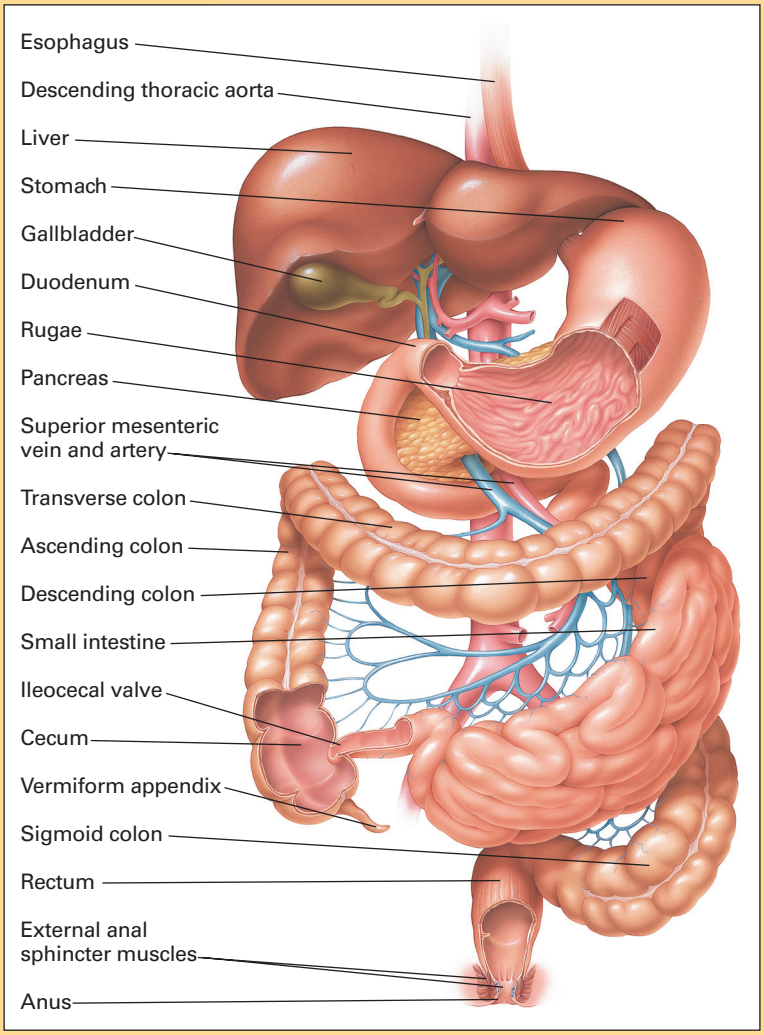
Volvulus. This occurs when the bowel becomes twisted on itself and cuts off its own blood supply. This leads to bowel ischemia and gangrene. The process can occur quickly and can progress to gangrene within 6 to 12 hours.[1]

Intussusception. This occurs most often in infants when the intestine telescopes and one part of the bowel slips into another. The prognosis for this condition is good, especially if surgery is performed immediately upon diagnosis. Death becomes more likely if intussusception isn't treated within 24 hours.[2] (See Causes of intestinal obstruction.)

Crohn's disease. This disease is a recurrent, granulomatous type of inflammatory bowel disease (IBD). While medications have proven to be effective in creating and maintaining remission in some cases of Crohn's disease, two-thirds to three-quarters of people with the condition eventually need surgery.[6] As a result of the inflammatory response, the bowel wall thickens and the intestinal lumen narrows, which may result in an intestinal obstruction.[2,6] Patients with recurrent symptoms or complica-

Organs of the GI system

This illustration shows the organs of the GI tract and several accessory organs.



tions of Crohn's disease, such as abscess formation or intestinal obstruction, may require additional surgery.[6]

Foreign body obstruction. A remarkable number of items are accidentally ingested or deliberately inserted into the digestive tract. These items must be removed before they perforate the intestine, block the normal digestive flow, or cause irritation or inflammation that can lead to infection.

Benign or cancerous tumors. Colon cancer is on the decline—deaths from colorectal cancer decreased 5.7% from 2002 to 2004.[7] Tumors resulting from colon cancer block the intestines. Tumors from other sources, such as the liver, pancreas, or pelvic organs, may also compress portions of bowel to the point of ischemia.

Diverticular disorders. These are disorders in which small pouches, called diverticula, develop inside the intestinal wall.[2] When treated medically and with dietary adjustments, patients can sometimes prevent this condition from worsening. If the sacs become infected or inflamed, diverticulitis develops. Infection occurs when food becomes trapped in a diverticulum, creating inflammation and infection. If a diverticulum were to rupture under these conditions, emergency surgical intervention would become necessary.

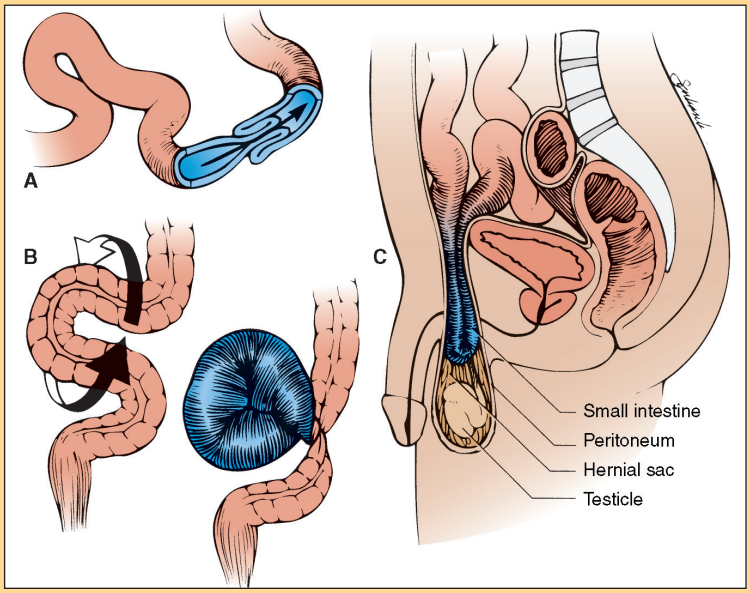
Other causes of mechanical obstruction include fecal impaction, or intestinal infections such as *Salmonella*, *Shigella dysenteriae*, and *Escherichia coli*.[1]

Nonmechanical causes

A nonmechanical bowel obstruction is called an ileus.

Possible causes of intestinal obstruction

(A) Intussusception invagination or shortening of the colon caused by the movement of one segment of bowel into another. (B) Volvulus of the sigmoid colon; the twist is counterclockwise in most cases. Note the edematous bowel. (C) Hernia (inguinal). The sac of the hernia is a continuation of the peritoneum of the abdomen. The hernial contents are intestine, omentum, or other abdominal contents that pass through the hernial opening into the hernial sac.



This occurs when peristalsis stops. Peristalsis is the involuntary, rhythmic contraction of the muscles of the GI tract that forces the contents along.[4] Without movement, intestinal contents collect. This stasis of partially digested food or lack of motion can lead to inflammation, infection, and possible rupture. Peritonitis, sepsis, and death may rapidly follow. Nonmechanical causes include:

Medications. Opioids and some antipsychotic drugs, antidepressants, and antihistamines are known to slow peristalsis. Patients who undergo chemotherapy are advised to practice good bowel habits, such as increasing fluid and fiber intake, since chemotherapy can slow bowel function.

Abdominal injury. Blunt force trauma to the abdomen can lead to intra-abdominal bleeding. This can harm the bowel in several ways. For instance, blood loss from the injury redirects normal blood flow from the intestines. If the intestines themselves are injured, blood loss coupled with infectious GI spillage occurs. Bowel obstruction can also be a postoperative complication of abdominal surgery.

Diagnosis

Symptoms, history, and a lack of bowel sound alert healthcare providers to the potential of an obstructed bowel. (See Prevent-

ative measures.) If a patient has a prior history of obstructions or of a chronic illness, such as IBD, the index of suspicion would be raised.

Diagnosis is confirmed with X-ray or computed tomography (CT) study. An ultrasound would also indicate the existence and location of the intestinal blockage. A barium enema may be used in selected cases.

Treatment

With any suspicion of intestinal obstruction, the patient should be advised not to eat or drink anything until a specific diagnosis is made. If an obstruction exists, more food or liquid would put additional pressure on the bowel from above. Should this patient require surgery, maintaining an N.P.O. status is essential.

When a patient presents with an intestinal obstruction that requires immediate attention, a nasogastric tube is inserted to clear the stomach and intestines above the blockage. This helps reduce some of the pressure inside the bowel and hopefully prevent a rupture. The tube is left in place and connected to suction to prevent the persistent vomiting of gastric secretions common with a bowel obstruction.

Because the digestive process is disrupted, the patient is in danger of dehydration and electrolyte imbalance. Water, plus essential nutrients and minerals, are trapped in the bowel, excluding them from general circulation. This may cause a potassium im-balance that can affect the function of the heart. In these cases, I.V. fluid and electrolyte replacement must quickly be addressed.

Whether or not a rupture of the intestine has occurred, antibiotic therapy is recommended. A nonruptured, inflamed bowel is categorized by the Centers for Disease Control and Prevention as a class II: clean-contaminated surgical site.[8] There's an increased risk of infection because the surgery is performed on an inflamed part of the body. If the intestine ruptures with gross spillage of bowel contents, the risk of infection rises to class III: contaminated. Antibiotic therapy is prudent at this juncture. However, caution must be taken to prevent the overuse of antibiotics that may destroy essential intestinal bacteria.

Not all bowel resections occur under urgent circumstances. For instance, there are cases when a potential intestinal obstruction could be caused by increasing tumor size. Waiting to operate until a preoperative course of radiation shrinks the tumor may improve the surgical outcome. Patients with a hernia or IBD may schedule their surgery under more controlled circumstances.

Preventative measures

Overall, there isn't any one thing that prevents intestinal obstructions. It's worthwhile to maintain good bowel health and prevent fecal impaction with good health habits, such as a high fiber diet, drinking enough water, and using stool softeners if necessary.[3]

Since bowel obstructions can't always be prevented, recognizing the signs and symptoms and acting on them before the situation becomes life-threatening is crucial. The following should be addressed by a healthcare provider if they persist or cause a change in overall status:[3]

- abdominal pain or cramping
- abdominal distention
- nausea and vomiting
- fever with a temperature above 101°F (38.3°C)
- dehydration
- diarrhea (may be early sign of obstruction)
- constipation or no flatus.

Surgical intervention

When a patient is able to electively schedule her intestinal resection, a bowel preparation is often prescribed. This may include a low residue or liquid diet for a day or two prior to surgery, and mechanical cleansing of the colon with either a laxative, an enema, or both.

It was thought that emptying the colon of solid waste reduces the amount of bacteria present when the resection is performed. However, the necessity of the preoperative bowel preparation has recently been questioned. In a recent study, patients who performed mechanical bowel preparation had a higher rate of wound infection, pulmonary complications, and more complications overall.[9]

Intraoperative medication administration may depend on the preoperative diagnosis. Antibiotics are routinely used, due to the infection risk classification of clean-contaminated or contaminated.

Perioperative precautions

Since these cases pose such a

high risk of infection, additional measures are taken in the OR.

Many surgeons irrigate the peritoneal cavity with warm 0.9% sodium chloride solution or an antibiotic irrigation solution before closing to further decrease contamination.

Intraoperatively, the patient is monitored for fluid and electrolyte balance by the anesthesia care provider. If an indwelling catheter is in place, care must be taken to monitor output and observe the color of the urine. If the patient experienced trauma with extensive internal damage, kidney and bladder function must be closely observed. Depending on the patient's condition, the surgeon's preference, and the location of the blockage, surgery may be performed through an open incision or via laparoscopy.

Prognosis

The outcome of an intestinal obstruction depends on an early diagnosis and prompt treatment. Complications of untreated obstruction include strangulation, perforation, sepsis, and death.[1]

Remember that the patient may be compromised by infection, dehydration, electrolyte imbalance, or any preexisting conditions he might have beyond the current emergency. By carefully managing all aspects of the perioperative experience, we can help provide the best outcome for our patients. ❖

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