PICTURE YOURSELF driving along a highway and suddenly coming to a roadblock. You look for a way around it and discover that there’s no escape. Other cars gang up behind you and honk their horns. Traffic is at a standstill.

An intestinal obstruction is a lot like that roadblock. It impairs the forward flow of digestive juices through the small or large intestine and impedes digestion. (See How a Blockage Impedes Absorption.) Let’s review how the problem develops and how you can help a patient who’s affected by the backup.

**Where and why**
Most intestinal obstructions occur in the small bowel, especially in its narrowest segment—the ileum. Obstructions in the large bowel generally affect the sigmoid colon. The mortality rate for acute obstruction is 10% for the small bowel and 30% for the large bowel. These rates double when blood flow to a bowel segment stops, causing infarction.

The causes of intestinal obstruction can be neurogenic, mechanical, or vascular.

*Neurogenic factors* are responsible for ileus, the most common type of intestinal obstruction. Adynamic (paralytic) ileus, a stoppage of intestinal peristalsis for more than 72 hours, is the sympathetic nervous system’s response to peritoneal insult. The severity and duration depend in part on the type of insult.

To some degree, all patients who have abdominal surgery develop postoperative ileus because being handled irritates the bowel. Blood, colon contents, or urine may also irritate the peritoneum during surgery. Other causes of adynamic ileus include trauma, hypokalemia, myocardial infarction, and vascular insufficiency.

*Mechanical causes* of intestinal obstruction include adhesions, hernias, diverticulitis, tumors, gallstones, and intussusception. Ad-
obstruction?
Adhesions and hernias account for up to 75% of small-bowel obstructions, with adhesions posing the greater risk in adults and hernias occurring more in children.

Cancer accounts for about 80% of mechanical large-bowel obstructions and most commonly affects the sigmoid colon. Sigmoid diverticulitis and volvulus (the bowel twisting in a loop) may also obstruct the large bowel.

Vascular causes of intestinal obstruction include complete or partial occlusion of the celiac and mesenteric arteries. When an embolus triggers an acute mesenteric obstruction, the mortality rate is 75%; the patient requires emergency surgery. Atherosclerosis of the mesenteric arteries commonly causes partial occlusion, which may be asymptomatic.

Ischemia in the intestine is the most serious consequence of intestinal obstruction because it can pave the way for peritonitis, perforation, hemorrhage, and gangrene. Ischemia makes the bowel more permeable, so normal bowel flora *Escherichia coli* and *Klebsiella* may penetrate the bowel wall and enter the peritoneal cavity, causing peritonitis and septic shock.

**Signs and symptoms point the way**

Your patient’s signs and symptoms will depend on the location, cause, duration, and other characteristics of the intestinal obstruction. (For assessment tips, see *Taking Stock of*...
the Problem.) Here’s a review of potential problems.

- **Abdominal discomfort or pain.** Generally, the higher an intestinal obstruction, the more severe the pain. A small-bowel obstruction typically causes intermittent colicky pain in the midabdomen. With partial obstruction, pain may occur after the patient eats and resolve as digestion progresses. Mechanical obstruction of the large bowel can cause colicky pain in the lower abdomen, but it’s typically much less intense than with a small-bowel obstruction. Adynamic ileus may cause distension and discomfort without colicky pain.

Steady, severe, localized pain may signal strangulation. If an acute ischemic obstruction isn’t treated, the patient will develop fever, leukocytosis, and shock as the ischemic bowel segment develops gangrene.

With chronic ischemia, the patient may initially have pain 15 to 30 minutes after a large meal if an occluded artery can’t meet the body’s increased oxygen needs for digestion. As occlusion worsens, pain occurs even after small meals and eventually becomes almost continuous.

- **Vomiting.** An obstruction can trap up to 8 liters of gastrointestinal (GI) secretions in the intestines. The higher the obstruction, the sooner in the disease process vomiting will occur and the more profuse it will be. The characteristics of the vomitus provide clues about the location of an obstruction:
  - *profuse clear gastric fluid,* obstruction at the pylorus
  - *bile and mucus,* a high small-bowel obstruction
  - *gastric contents and bile,* paralytic ileus
  - *bile-stained fluid with mild distension,* obstruction in the proximal small intestine
  - *orange-brown feculent drainage,* low ileal obstruction.

Feculent vomitus indicates bacterial overgrowth proximal to the obstruction and is a poor prognostic sign.

- **Distension.** A hallmark of intestinal obstruction, abdominal distension becomes more pronounced the farther down the GI tract the obstruction occurs. A small-bowel obstruction distends the upper quadrants, and a large-bowel obstruction distends the lower abdomen.

Untreated intestinal distension is self-perpetuating: Increased pressure compromises blood flow and impedes venous drainage; tissue edema and increased blood flow prevent normal reabsorption so gas builds up. Intestinal bacteria act on the stagnant bowel contents, gas production increases, and distension worsens.

As distension worsens, intraluminal pressure exceeds abdominal pressure. Increased capillary permeability lets large amounts of isotonic fluid move from the plasma to the distended bowel, and trapped fluid leaks into the peritoneum. The bowel can rupture if the pressure becomes too great.

- **Altered bowel sounds.** In mechanical small-bowel obstruction, intensified peristalsis causes hyperactive bowel sounds proximal to the obstruction. If obstruction is complete, sounds distal to the obstruction are hypoactive, quiet, or absent because the intestine is empty.

- **Stool changes.** The location of an obstruction affects stool size, consistency, and amount. For example, a patient with a partial small-bowel obstruction may have normal stool and normal output or he may have diarrhea. If obstruction is complete, he may not pass any stool at all.

Thin, ribbonlike stools may signal large-bowel obstruction, which causes progressive constipation until finally the patient can’t pass any stool. However, he may have a watery discharge as increased proximal peristalsis forces accumulated fluid past the obstruction.

Bloody stool is rare with small-bowel obstruction but does occur with intussusception. Bloody stool is more common in large-bowel obstructions caused by ulcerative colitis, cancer, or diverticulitis.
Problems beyond the GI tract

Aside from the local effects of intestinal obstruction, your patient is at risk for alterations in fluid and electrolyte levels and blood pH.

Fluid and electrolyte imbalances can occur if copious vomiting or sequestration of fluids in the intestine prevents reabsorption of electrolyte-rich digestive fluids into the bloodstream. As a result, extracellular fluid and plasma volume decrease, causing dehydration and hypernatremia. Signs of dehydration include an increased hematocrit level, decreased central venous pressure, tachycardia, and hypotension. If dehydration is severe, the patient may develop renal insufficiency or hypovolemic shock and die.

Metabolic alkalosis or acidosis is another risk. Alkalosis can occur if hydrogen ions in the gastric juices aren’t reabsorbed because of obstruction high in the small bowel or if the patient has been vomiting.

In the later stages of obstruction or when an obstruction affects the large bowel, the risk of metabolic acidosis is greater. One reason is that the obstruction may prevent absorption of bicarbonate in pancreatic secretions. If the patient’s nutritional reserves are depleted, he may develop ketosis that worsens the acidosis. Finally, if distension pressing on the abdominal arteries causes bowel ischemia, anaerobic metabolism increases lactic acid production, which worsens acidosis.

Medical or surgical intervention?

A patient’s history and physical findings typically indicate the type and extent of intestinal obstruction. (For diagnostic tests that can help shed light on his condition, see Testing for Obstruction.) Once the type of obstruction is identified, the physician initiates medical or surgical interventions to eliminate the obstruction, decompress the GI tract, correct systemic fluid and electrolyte imbalances, and prevent infection.

Medical interventions, such as discontinuing oral intake, instituting nasogastric (NG) suction, or passing an intestinal tube, are best used for an incomplete nonmechanical obstruction. For example, adynamic ileus responds to continuous GI decompression and treatment of the primary disease. An NG tube attached to suction can help remove fluid and gas, prevent vomiting, and reduce the risk of aspiration, atelectasis, and pneumonia. However, for a mechanical obstruction caused by adhesions, a hernia, or a tumor, an intestinal tube alone is ineffective because it would stop at the point of obstruction and decompress only the proximal portion.

Surgery is indicated to remove most vascular and mechanically caused obstructions and any ischemic bowel tissue. For example, adhesions completely obstructing the small bowel must be surgically removed. A complete colon obstruction also calls for surgery: A colostomy followed by resection of the primary lesion is the procedure of choice for a left-sided obstruction. Primary resection and anastomosis is appropriate for a lesion in the right or transverse colon.

Before surgery, provide your patient with fluid and electrolyte replacement and insert an NG tube for decompression. Administer broad-spectrum antibiotics as ordered if strangulation is suspected.

Managing your patient’s care

Whether your patient’s intestinal obstruction is managed medically or surgically, perform the following measures:

- Assess him at least every 4 hours. Document vital signs, pain assessment, mental status, and fluid intake and output, including output from his NG tube. Weigh the patient daily. Be vigilant for signs of early shock, such as an increased pulse rate.
- Replace fluids and electrolytes as ordered. He may require additional sodium chloride, bicarbonate, and potassium to replace lost electrolytes and restore fluid balance. A urine output of at least 30 ml/hour indicates adequate hydration.
- Administer medications as ordered, such as antiemetics to control vomiting and antibiotics to reduce bacterial overgrowth in the bowel. The physician will order analgesics at a dosage sufficient to control abdominal pain without masking signs of increasing obstruction. (He may not order opioids because they slow peristalsis.) Offer your patient alternative pain
relief strategies, such as massage and repositioning, and relaxation techniques, such as music therapy.

- If the patient has an NG tube, make sure it's positioned properly and the suction is adequate. To maintain patency and drainage, irrigate the tube with 0.9% sodium chloride solution and reposition it as needed. Monitor and document the volume, odor, and consistency of the drainage and note changes in the degree of your patient's nausea and abdominal distension.

- Position your patient with the head of his bed elevated to relieve abdominal pressure and allow frequent position changes.

- Provide oral and nasal care every 2 to 4 hours to help alleviate dryness and irritation from being N.P.O. and having an NG tube.

- Third-space fluid shifts are common with intestinal obstruction, so assess for edema. Measure your patient's abdominal girth every 2 to 4 hours, placing the tape at the same location each time.

- Assess your patient's level of knowledge and desire for information. Explain his tests, procedures, and planned care. If he receives a cancer diagnosis or needs a colostomy, provide emotional support and contact the appropriate services, such as an ostomy nurse or the social service department.

- As soon as your patient's condition stabilizes, help him out of bed. An upright position relieves abdominal pressure and eases breathing. Activity also helps reestablish peristalsis and hastens recovery.

- Keep the physician informed of your patient's status. Immediately report signs and symptoms of bowel strangulation, such as vomiting, increasing distension, temperature elevation, or pain that changes from cramping to constant. Report blood levels of sodium, potassium, bicarbonate, and blood pH, as well as changes in mental status, vital signs, urine output, and the amount of NG tube output.

- Tailor discharge teaching to your patient's needs. If he's had surgery, teach him about wound healing and reestablishing a normal diet. Tell him how to prevent constipation with fiber-rich foods, adequate fluids, and exercise.

**Road to recovery**

When an intestinal obstruction detours your patient's digestion, you can help him avoid problems while he's on the road to recovery.

**SELECTED REFERENCES**


**SELECTED WEB SITES**

Mayo Foundation for Medical Education and Research
http://www.mayomed.org/home

National Institute of Diabetes and Digestive and Kidney Diseases
http://www.niddk.nih.gov/index.htm
Last accessed on September 6, 2001.

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