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Be prepared for bariatric patients in the OR

By Shannon Idzik, DNP, CRNP; Nicholas Troeleman, BSN, RNFA; and Amanda Mielke, BSN, RNFA

Over two-thirds of adults in the United States are overweight or obese.[1] More than 14% of adults have Class 2 obesity or higher, defined as a body mass index [BMI] of 35 or higher, compared with the normal range of 18.5 to 24.9 (see *Is my patient obese?*).[2] If current trends continue, all adults in the United States will be obese by 2102.[3]

This article focuses on the perioperative nurse's role in caring for bariatric patients in the OR. One report found that up to 8% of OR cases involved patients with extreme obesity (BMIs of 40 or more).[4] Perioperative nurses also are caring for increasing numbers of patients undergoing bariatric surgery for weight loss. In 2008, of the 344,221 bariatric surgeries performed worldwide, 220,000 were performed in United States and Canada.[5]

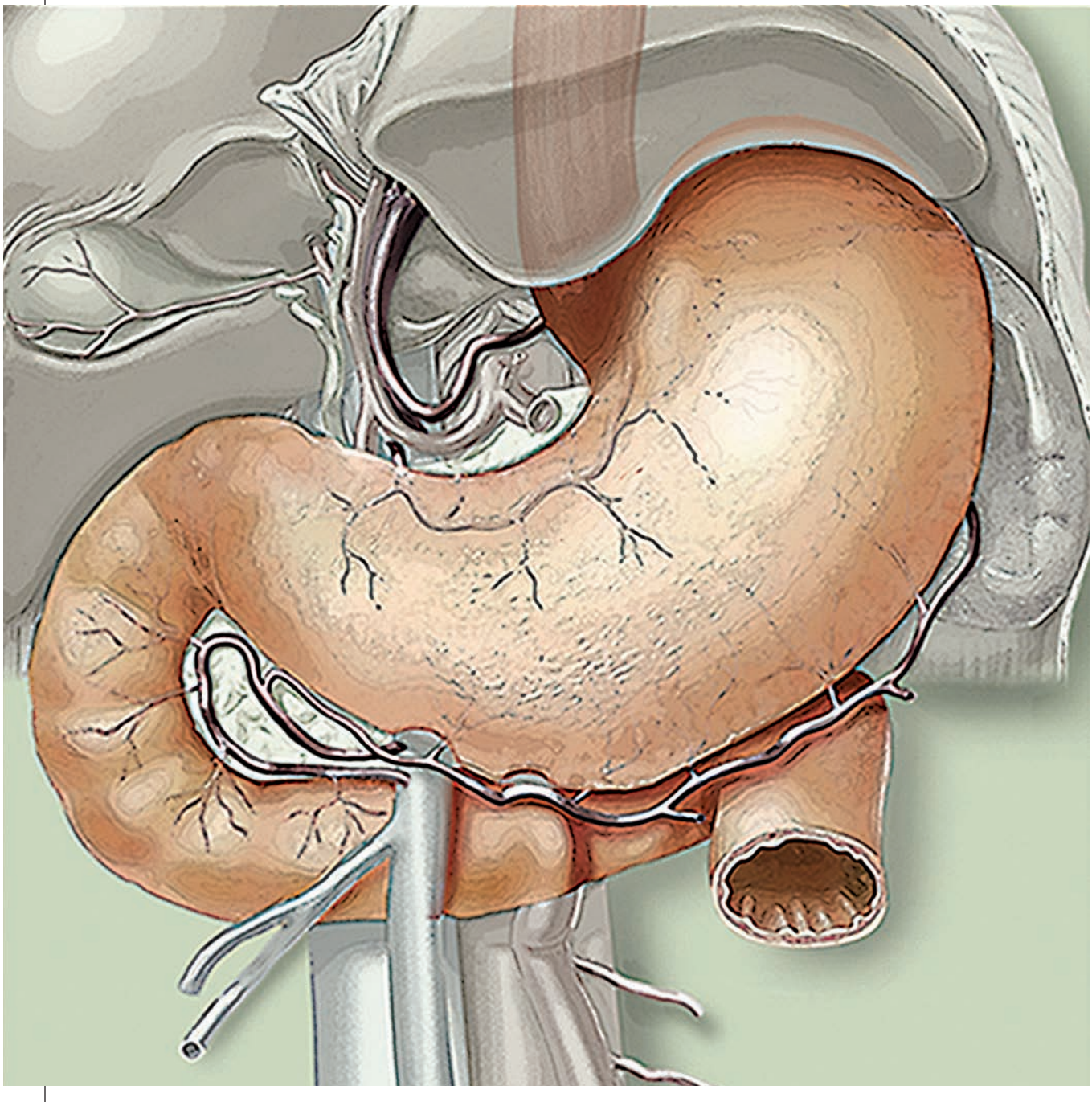
When bariatric surgery is indicated

BMI, the standard tool used to classify body weight, is also used to determine a patient's need for bariatric surgery. Although BMI is an imperfect measure, it correlates well with other measures of body fat and with total body adiposity.

Bariatric surgery is an option for patients who have a BMI of 40 or more and have failed other nonsurgical efforts. Patients with a BMI of 35 to 39.9 who have comorbidities or a significant reduction in quality of life should also be considered for bariatric surgery.[6]

Bariatric surgery also is being researched as a treatment for type 2 diabetes. More than 85% of patients with diabetes and BMIs of less than 35 (that is, a weight that doesn't meet the BMI criteria for

Find out what you need to know about weight-loss surgeries and the special needs of obese patients.



bariatric surgery) had improvement in diabetes after bariatric surgery, which in these cases is called metabolic surgery.[7]

Several meta-analyses and systematic reviews have shown that bariatric surgery is safe and effective. Buchwald and colleagues examined 136 studies and found that the overall percentage of excess weight loss (the amount of weight lost expressed as a percentage of the patient's weight in excess of his or her ideal weight) for bariatric procedures was 61.2%.[8]

Significant numbers of patients had resolution of diabetes, obstructive sleep apnea, hyperlipidemia, and hypertension.[8]

Another meta-analysis found bariatric surgery to be more effective than nonsurgical weight loss treatments for patients with a BMI of 40 or more.[9] Patients lost 44 to 66 pounds (20 to 30 kg) and were able to maintain that weight loss for up to 10 years. Similar findings were found for patients with BMIs of 35 to 39.9.[9]

A systematic review found that bariatric surgery resulted in greater weight loss than conventional treatment, such as very low calorie diets, counseling, and pharmacotherapy. Data showed that 8 years after bariatric surgery, patients had lost an average of 46.2 pounds (21 kg) and had improvement in quality of life, diabetes, and hypertension, compared to the nonsurgical patients, who'd gained weight.[10]

Studies have also compared bariatric surgery patients to control groups.[11,12] Despite complications, studies show a reduction in the relative risk of death by 72% when comparing the bariatric surgery group to a gender, age, and BMI-matched control group.[12]

Preoperative considerations

A team approach to care, including experienced surgeons and physicians, nurses, nutritionists, anesthesiologists, psychologists and, as needed, cardiologists, pulmonologists, rehabilitation therapists, and psychiatric staff is essential for a proper preoperative evaluation. Nurses play a critical role in the preoperative education of patients preparing for bariatric surgery.

Bariatric patients are at higher risk for venous thromboembolism (VTE), and unless contraindicated, should have preoperative prophylaxis. Current regimens use a variety of modalities, including low-dose unfractionated heparin (LDUH), low-molecular-weight heparin (LMWH), sequential compression devices (SCDs), graduated compression stockings, and early ambulation. Current clinical practice guidelines recommend that patients undergoing bariatric surgery receive thromboprophylaxis based on risk stratification. Patients at low risk should receive mechanical prophylaxis with SCDs. Patients at moderate risk should receive LMWH, LDUH, or mechanical prophylaxis if they're not at high risk for bleeding. Patients at moderate risk for VTE and high risk for bleeding should receive mechanical prophylaxis. Patients at high risk for VTE should receive LMWH or LDUH and mechanical prophylaxis. Inferior vena cava (IVC) filters are no longer recommended for VTE prophylaxis.[13] Guidelines also recommend following the manufacturer's dosing recommendations and consulting a pharmacist as needed; higher doses of LMWH or LDUH may be needed in obese patients compared with those who aren't obese.[13]

Is my patient obese?[6]

The National Institutes of Health classifies body weight according to BMI as follows:

- Underweight—BMI of less than 18.5
- Normal weight—18.5 to 24.9
- Overweight—25 to 29.9
- Obesity (class 1)—30 to 34.9
- Obesity (class 2)—35 to 39.9
- Extreme obesity (class 3)—40 and over

Types of bariatric surgery

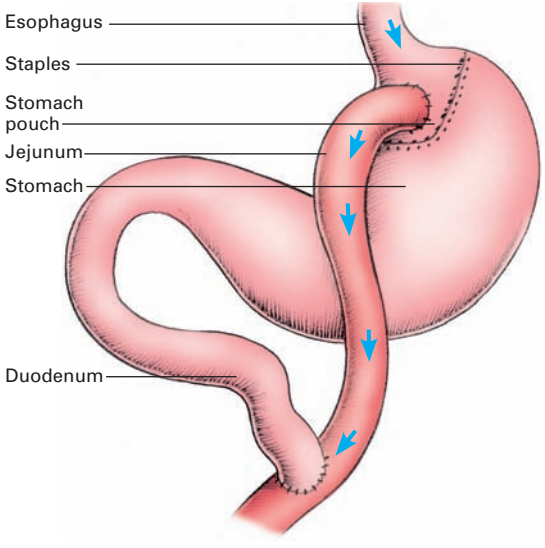
Bariatric surgeries can use restrictive, malabsorptive, or combination techniques (see *Common bariatric surgeries*). Over 90% of surgeries are performed laparoscopically, but the decision to perform surgery laparoscopically versus open depends on surgeon expertise and patient factors including degree of obesity and past abdominal surgeries.[5]

Restrictive procedures cause weight loss by reducing gastric capacity, and include adjustable gastric banding, vertical banded gastroplasty, vertical sleeve gastrectomy (also known as sleeve gastrectomy), and gastric plication. Laparoscopic adjustable gastric banding is the most commonly performed bariatric surgery (42.3%) worldwide.[5] During a sleeve gastrectomy, the majority of the greater curvature of the stomach is removed, leaving a sleeve-like tube, about 25% of its original capacity, as the remaining stomach.

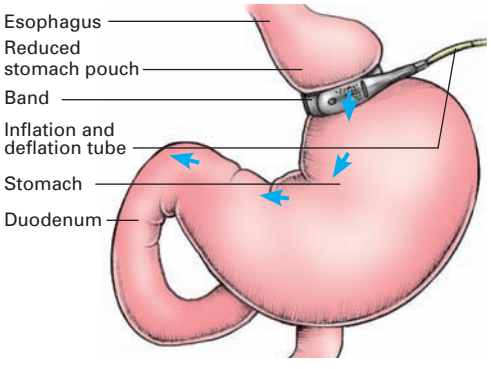
Gastric plication, a new procedure, is still considered investigational. The surgery creates

Common bariatric surgeries

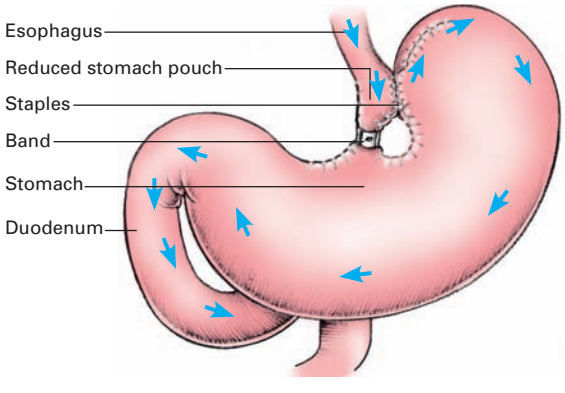
Roux-en-Y gastric bypass
In this combination procedure, a 20- to 30-mL gastric pouch is created and the distal stomach, the entire duodenum, and a varying length of the jejunum bypassed, causing mild malabsorption.



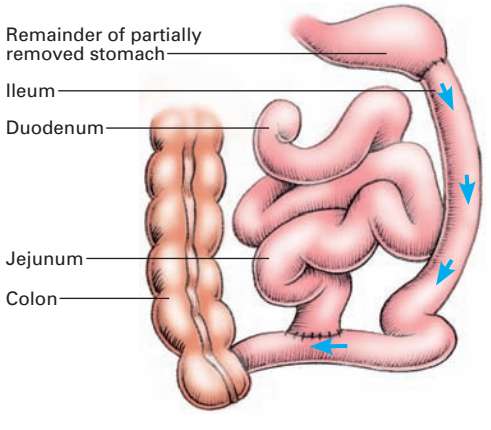
Laparascopic adjustable gastric banding
This procedure involves placing a silicone band around the fundus of the stomach to restrict its capacity.[5] A healthcare provider can adjust the band (and therefore the size of the stomach) by injecting saline through a subcutaneous port in the abdominal wall.



Vertical banded gastroplasty
In this surgery, a pouch is created on the lesser curvature of the stomach, using surgical staples, with a silastic band on the outlet of the pouch.



Biliopancreatic diversion
This malabsorptive procedure involves a bypass of the majority of the small intestine and removal of a large portion of the stomach.



Source: *Surgical Care made Incredibly Visual.* Philadelphia, PA: Lippincott Williams & Wilkins; 2007:70-71.

an intraluminal fold by infolding the greater curvature of the stomach and thus creating gastric restriction. Because this procedure doesn't use an implanted device or gastric resection, some of the associated surgical risks are reduced.[14]

Malabsorptive procedures account for less than 2% of the bariatric surgeries performed in the United States and Canada.[5] Although malabsorptive procedures were common in the early years of bariatric surgery, they're less favored today

because of the risk of severe nutritional deficiencies. However, they still may be used for patients who have a significant amount of weight to lose, because the percentage of excess weight lost is greater than with other types of surgery. The jejunoileal bypass is an end-to-end anastomosis of the jejunum to the terminal ileum bypassing a large portion of the small intestine. The biliopancreatic diversion involves a bypass of the majority of the small intestine and removal of a large portion of the stomach causing malabsorption.

Combination procedures such as the Roux-en-Y gastric bypass and Fobi pouch induce weight loss primarily through restriction, but also create malabsorption. Laparoscopic Roux-en-Y gastric bypass is the second most commonly performed (39.7%) bariatric surgery worldwide.[5] Conversion to Roux-en-Y gastric bypass is also an option for patients with vertical banded gastroplasty failure, but poses an increased risk of postoperative complications such as anastomotic stenosis and incisional hernia.[15] The Fobi pouch is a modification of the gastric bypass procedure, involving a small vertical pouch (less than 25 mL) that's banded distally by a silastic ring and is followed by a gastric bypass.[14]

Perioperative care

Positioning obese patients can be challenging because of the increased risk to skin, tissues, nerves, and joints. The patient may need multiple position changes during surgery, and must be safely secured. Adipose tissue can mask joint locations, and improper alignment of joints puts patients at risk for hyperextension. Transfer mattresses with built-in positioning ramps for intubation have reduced the need for perioperative nurses to devise makeshift lift ramps or reposition the patient multiple times in order to achieve proper positioning for intubation and anesthesia induction.

Anesthesia for bariatric surgical procedures should be performed by providers specially trained in the management of bariatric patients, and regularly assigned to bariatric surgery cases. Anesthesia staff should be familiar with the equipment, instruments, and procedures common to bariatric surgery. The anesthesia provider may need to use a fiberoptic scope for intubation and should have a difficult airway cart available. (This cart contains various styles and sizes of laryngoscopes, supraglottic airway devices, retrograde intubation equipment, and supplies for establishing an emergency surgical airway.)

Perioperative staff must be able to transfer, position, and support anesthetized bariatric patients (see *Facilities and equipment for bariatric patients*). Special purpose transfer devices that rely on forced air to facilitate lifting are preferred. Be aware of modifications that can be made for the safety and ergonomics of the staff. Provide standing stools for better staff position over large patients, and maintain laparoscopic monitors at proper height to prevent neck strain. Padded floor mats can alleviate the strain of prolonged standing in one place.

Postoperative care

The postanesthesia care unit staff should be experts in the immediate postoperative care of obese patients and their special needs, particularly for ventilatory support, prevention of complications, identification of complications, resuscitation and medication requirements, and patient transfer.

Ventilatory support in this postoperative population is complicated by preexisting obesity. Respiratory depression is the major concern in obese patients because upper abdominal adipose tissue can restrict lung expansion and decrease respiratory effort.[16]

Obstructive sleep apnea and other breathing disorders are common in patients with obesity, and opioids increase the risk of respiratory depression in patients with these conditions. Therefore, vigilant monitoring of opioid administration is important and, in fact, opioid-sparing multimodal analgesia (such as local anesthetic wound infiltration) is recommended to decrease respiratory depression.[17]

Patient-controlled analgesia (PCA) may be used for surgical pain control and usually is discontinued on postoperative day 1 when the patient begins oral medications. However, obese patients need to be closely monitored when using PCA. Perform regular assessments for pain and sedation level, and avoid using sedatives in obese patients receiving opioid analgesia.[16] Additional recommendations to safely and effectively manage postoperative pain in the obese patient include elevating the head of the bed to 30 degrees (unless contraindicated), early ambulation, and supplemental oxygen administration with oxygen saturation and end-tidal carbon dioxide monitoring.[16]

Although prevention of complications begins in the OR, maintenance continues in the postoperative

Facilities and equipment for bariatric patients

As the number of obese patients increases, designing or redesigning facilities to meet their needs is an emerging issue in healthcare finance, facility management, and engineering. An administrative commitment to adequate facilities and equipment, as well as a properly trained staff is essential to safely care for bariatric patients and protect staff from injury.

Facilities need to address these questions:

- What are the needs of the bariatric patient population?
- What are the facility and engineering requirements?
- What overall equipment is required?
- What are the dimensions and storage needs for the equipment?
- How and where are patients transported?
- What types of procedures are being performed?
- What surgical equipment is required?
- What are the staffing needs and training?
- What are the fire and emergency evacuation strategies?

New design and redesign of facilities to accommodate bariatric patient needs requires input from all members of the healthcare team, most importantly nursing. For example on the nursing unit, a patient room width of 120" is needed for nurses to move safely when providing bariatric patient care.[22,23] An additional 42" to 48" of room width should be considered if bedside commodes, wheelchairs, or stretchers will be needed to transfer patients. A space 72" in diameter may be required for lifting equipment.[22] Doorway openings must be 45" wide to safely accommodate bariatric wheelchairs, and at least 52" wide for passage of bariatric stretchers (standard doorways are 36" wide).[23] Facilities can deal with the issue of room size by converting double rooms into single rooms, for example.

Elevators, a critical area in patient transport that's often overlooked, must be large enough to accommodate the size and weight of bariatric beds, patients, staff, and equipment.[23]

Pre- and postoperative areas should be equipped with floor-mounted toilets. China toilets have a maximum weight of 300 pounds, so enamel-coated stainless steel toilets (which can support 750 to 1,200 pounds) should be considered.[23] Floor-mounted sinks can withstand greater weights, but interfere with wheelchairs. Wall-mounted sinks with a rating of 300 pounds are an alternative, but may not withstand the downward pressure from larger patients.[23] Shower facilities should be open with a floor drain and include wall-mounted grab bars to allow for safe staff assistance. Wall-mounted fixtures must be reinforced to accommodate weight. Bathrooms should allow for space on both sides of the toilet and shower for patient assistance.

More and more equipment and supply manufacturers are developing specialized bariatric equipment. Nurses caring for bariatric patients must participate in assessing current inventory and determining future needs. Needs can be prioritized, but despite cost, facilities should have more than one of any piece of specialized equipment needed for bariatric patient care.

Gowns, BP cuffs, stockings, compression devices, tourniquets, abdominal binders, and gait belts must all be appropriately sized for accuracy, safety, and patient dignity. Scales weighing patients up to 1,000 pounds, while costly, are readily available.

Evaluate weight ratings and width on all equipment, including beds, stretchers, exam tables, OR tables, wheelchairs, lifts and transfer devices, chairs, recliners, bedside commodes, and radiologic devices.

Newer beds are designed to accommodate greater weights (often as much as 1,000 pounds). Some offer turning assistance to aid in patient positioning, percussion therapy, pulsating air suspension therapy, pressure relief therapy, and cardiac chair positioning. Along with newly designed bed frames, specialty mattresses can help reduce the risk of pressure ulcers and may improve patient outcomes.[24] To allow safe patient repositioning, beds should allow for 6" of space on either side of the supine patient.[22] Moving heavy beds and stretchers is a staff safety concern. New technology is available that can help to minimize the risk of injury to patient and staff. Two types of patient transport technologies are available: a standalone, detachable, or independent battery-powered device that attaches to a bed or stretcher and propels it forward or backward; and transport technology built into the bed and powered by simply pressing two buttons, unplugging the bed, and releasing the brakes. Powered transport devices are becoming popular because they reduce the risk of staff injury, and are particularly important in bariatric patient care.

The OR needs special OR tables and ancillary equipment to accommodate patients weighing up to 750 pounds. Some specialty tables will handle patients who weigh 1,000 pounds or more. Split

Continued...

Facilities and equipment for bariatric patients (Continued...)

leg tables with foot boards and side extensions are needed to not only accommodate patients having bariatric surgery, but also obese patients having other surgeries.

Appropriate deep tissue, bariatric retractors, staplers, and long instruments are supplied to this specialty area as a matter of perioperative practice. Most bariatric surgeries are laparoscopic using standard bladeless trocars, but extra-long trocars may be needed. Standard laparoscopic instruments with long sets and long articulating endoscopic staplers should be available for each case. High-flow insufflators are recommended due to increased abdominal pressures in obese patients.[25] Many liver retractors are available, but must be strong enough to retract large heavy livers.[25]

Equipment that should be immediately available if the team needs to transition to an open abdominal procedure includes a long instrument set and deep table fixed retractor. Specialty devices and instruments should be constantly evaluated for effectiveness by the perioperative nursing staff, and replaced regularly.

Radiology equipment also must be able to accommodate bariatric patients, because patient outcomes can be threatened if imaging can't be obtained due to patient size. Computed tomography (CT), magnetic resonance imaging (MRI), fluoroscopy, and plain X-ray tables all have weight limits. A 2008 study found that more than 90% of EDs wouldn't be able to perform CT or MRI imaging on patients weighing more than 450 pounds, nearly 25% wouldn't be able to obtain CT imaging for patients weighing more than 350 pounds, and 67% wouldn't be able to obtain MRI studies in patients weighing more than 350 pounds.[26]

period. Properly fitted SCDs for VTE prophylaxis, placed in the OR, should remain in use throughout the patient's hospital stay. Patients should be out of bed and ambulating as soon as possible after surgery.

All bariatric surgeries carry the risk of pulmonary embolism (PE), cholelithiasis, port site hernias, gastrointestinal bleeding, wound infection, nutritional deficiencies, nausea, and vomiting. Complications of surgeries using bands include dysphagia, band slippage, band deflation, erosion of the band into tissue, and reflux symptoms. Complications of surgeries requiring dissection of the intestinal lumen include anastomosis stricture, anastomosis leak, and internal hernias.[18]

The most common life-threatening complications include anastomosis leak and PE. Anastomosis leaks may manifest in the perioperative period with signs and symptoms of sepsis or peritonitis, including tachycardia and increased fluid requirements. However, signs may be more insidious such as fever, malaise, left-sided abdominal pain, and shortness of breath.[19] Persistent hiccups in the immediate postoperative period should raise suspicion for a complication that is causing diaphragmatic or vagal nerve irritation, such as peritonitis from a leak.

Dyspnea, tachycardia, and chest pain can be signs of PE.[20] Signs suggestive of anastomosis leak or PE should be reported to the surgeon immediately. Although studies show that upper gastrointestinal series aren't helpful in predicting anastomosis leaks, they're still routinely performed on patients before oral intake is started.[21] Proper management of emergencies, including urgent airway issues, cardiac arrest, urgent patient movement, rapid transport, and patient evacuation can be difficult with bariatric patients, and should be part of training for specialized bariatric staff. In preparation for potential evacuation, verify access to ground transportation capable of transporting these patients safely. Have alternate plans in place in case any element of the primary plan fails.

Get ready

Obese patients and those seeking bariatric surgery are on the rise, and proper nursing care can improve these patients' health outcomes and prevent complications. **OR**

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Shannon Idzik is a faculty member in the adult and gerontological nurse practitioner program at the University of Maryland School of Nursing in Baltimore, Md., and a nurse practitioner at the University of Maryland Medical Center in Baltimore. Nicholas Troeleman is director of perioperative services at the University of Maryland Medical Center and Amanda Mielke is service line coordinator in perioperative services at the University of Maryland Medical Center.

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