# Chapter 15
# Risk Assessment and Reduction


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## 15.1 Risk Assessment

Risk assessment of the bariatric surgery patient begins with a comprehensive, in person clinical consultation with several objectives. The first is to get to know the patient, as well as their family or other member of their social support structure who will be helping the patient achieve a healthier lifestyle. In getting to know the patient, the surgeon begins to build the rapport that will be necessary to gain the patient's trust for what will be a long-standing clinical relationship that will span many visits over a multi-year time period to address a chronic health condition.

Second, the surgeon should conduct a traditional history and physical exam, focusing on not only the pertinent details of the patient's history of obesity and efforts to lose weight through diet, exercise, and medical treatment but also a detailed review of their past medical and surgical history, social history including tobacco, alcohol, or other substance use, their current work or important hobbies that may be impacted by surgery and the necessary recovery, and a detailed review of their medication list. Patients should also be assessed if they are up to date on age-specific cancer screening such as mammograms and colonoscopies. [1] By reviewing this information, the surgeon can quickly glean patient-specific risk factors that may impact their ability to safely undergo and recover from a complex surgical intervention and achieve the intended outcomes of weight loss and remission of their associated medical comorbidities.

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Particular interest should be given to a history of cardiovascular or cerebrovascular events; coagulation disorders; pulmonary health including smoking, COPD, and obstructive sleep apnea; history of gastrointestinal disorders; and previous abdominal and intestinal operations. Hepatic and renal disease and autoimmune disorders that might be treated by steroids or immune modulators should also be asked about.

A physical exam should include the patient's current height, weight, and body mass index (BMI) among other vital signs. An exam might detect previously unknown cardiovascular or pulmonary risk factors such as signs of congestive heart failure or arterial disease that should be evaluated and addressed before undergoing anesthesia. An exam might also identify abdominal pathology such as masses, hernias, or excessive abdominal surgical history that may complicate the ability to safely gain access to the abdomen or mobilize limbs of the intestine. Similarly, the presence of jaundice or other signs of severe liver dysfunction may preclude the patient as a surgical candidate.

Lastly, an assessment can begin to be made of the patient's degree of frustration imposed by their morbid obesity and psychological readiness to undergo surgical weight loss, as well as their prior knowledge about or research of the available operations and the involved recovery. In fact, many patients will come to the office having already done a great deal of online research about surgical weight loss or will have known someone who has already undergone surgery and may have some preconceived biases about the operations of choice. This preoperative research is beneficial, as a well-informed patient who has a solid understanding of the scope of weight loss surgery can reduce the risks of non-compliance or poor follow-up. This is a good opportunity to clear up any misconception about bariatric surgery functioning as a cosmetic intervention.

## 15.2 Risk Reduction

In our practice, risk assessment and reduction is achieved by evaluating and optimizing modifiable patient-specific risk factors to achieve a safer surgical outcome, even at the expense of delaying surgery when necessary. Here, we will address some commonly evaluated conditions.

### *15.2.1 Smoking*

Any patient with a smoking history is counselled on the need for cessation and offered resources to assist them in stopping tobacco use before surgery, typically by referral to their primary care provider. Our goal is to have the patient be free of smoking for at least 4–8 weeks before surgery to allow time for the effects on wound

healing and inflammation to reverse [2]. We confirm their cessation with a preoperative nicotine screen usually 1 week before surgery, but some advocate for a cotinine test 1–2 days prior [3] and there is evidence that smoking is underreported, especially preoperatively, suggesting we should be more aggressive in screening [4]. A recent National Surgical Quality Improvement Program (NSQIP) review of over 133,000 patients undergoing sleeve gastrectomy and Roux-En-Y gastric bypass found that 9.3% of the patients were smokers and suffered substantially worse 30-day outcomes, including risks of readmission, death, and respiratory complications [5]. Another NSQIP review of sleeve gastrectomy patients demonstrated increased risk of intubations and 30-day mortality in smokers [6]. Patients can be reassured that an effort to stop smoking should have little impact on their long-term weight loss. In a review of sleeve and gastric banding patients, pre- or post-operative smoking status was not associated with any significant difference in weight loss in long-term follow-up [7]. Moser found no significant difference in weight loss after sleeve gastrectomy, regardless of smoking status at 6, 12, and 24 months [8].

### *15.2.2 Substance Abuse*

Bariatric surgery patients may also have a higher lifetime risk of substance abuse and the physiologic changes after surgery may put them at increased risk of alcohol abuse [9]. We consider active alcohol abuse or alcoholism to be a contraindication to bariatric surgery of any kind, including duodenal switch, and these patients are referred for rehabilitation and detoxification. Although data exists for duodenal switch, there is concern in the gastric bypass patient that alcohol absorption may be accelerated and reach higher concentrations in the blood, putting patients at increased risks of alcohol use disorder after surgery [10]. Patients are counselled about the risks of post-operative substance use disorders.

Patients with a history of opioid abuse and recovery should be given non-opioid analgesics in the perioperative period and utilize local anesthetic blocks to control pain [11]. Enhanced recovery (ERAS) protocols are already becoming widespread in bariatric surgery and can be applied to the duodenal switch patient.

### *15.2.3 Psychosocial Evaluation*

Most third-party payers require psychosocial evaluation to determine that the patient does not have any untreated mental disorders or eating disorders as a condition of insurance approval. We refer patients to a local psychologist for this evaluation and follow any recommendations made. This topic is discussed in more detail in a prior chapter.

### 15.2.4 Cardiopulmonary Assessment

Although preoperative cardiopulmonary assessment is not typically a provision of insurance approval, consideration should be given to cardiac evaluation and screening of obstructive sleep apnea and obesity hypoventilation syndrome.

A good place to start, aside from a physical exam as mentioned above, is to assess the patient's functional status. This is done by evaluating a patient's ability to perform activities of daily living and is measured in metabolic equivalents (METs), which can be calculated using the Duke Activity Status Index. Perioperative cardiac risks are increased in patients unable to perform 4 METs [12].

The Revised Cardiac Risk Index is one of several available risk assessment tools to evaluate perioperative cardiac risk in patients undergoing non-cardiac surgery such as duodenal switch. The calculator gives one point and deems a patient high risk for any of the following: ischemic heart disease, cerebrovascular disease, congestive heart failure, insulin therapy for diabetes, serum creatinine level > 2 mg/dL, or planned high-risk surgery [13]. For patients in these categories, consideration should be given for referral to a cardiologist for consideration of preoperative stress testing, particularly if unable to perform 4 METs [14]. Patients on beta-blockade and statins should have these medications continued in the perioperative period.

The presence of obstructive sleep apnea (OSA) can similarly be assessed using questionnaires such as STOP-Bang [15] and the Berlin Questionnaire to evaluate for factors like snoring, daytime sleepiness, and measured neck size to determine if the patient may benefit from referral for polysomnography, which is the gold standard for diagnosing OSA and will quantify the number of apnea and hypopnea events per hour as the apnea-hypopnea-index (AHI). Several studies have demonstrated a significant prevalence of OSA in the bariatric surgery patient population of >60%. A recent expert consensus panel recommended preoperative and perioperative CPAP in patients with moderate to severe OSA, defined as an AHI > 15 and to have patients bring their own machine and mask to the hospital for the postoperative period. Patients should also be monitored with continuous pulse oximetry in the early postoperative period until sedatives and opioids minimized [16].

### 15.2.5 Chronic Steroid Immunosuppression

Some patients presenting for evaluation may be on chronic steroid immunosuppression for a variety of conditions. While there is no definitive study in the duodenal switch patient, reviews of gastric bypass and sleeve gastrectomy patients suggest an increase in postoperative complications. Kaplan found that patients on chronic steroids undergoing sleeve gastrectomy and gastric bypass had a 3.4 times increased risk of dying at 30 days postop and 2 times increased risk of serious complications [17]. Andalib found an almost 7 times increased risk of 30-day mortality and similar twofold risk of major morbidity in sleeve and gastric bypass patients who were

steroid dependent at the time of surgery. Also, there was no difference in 30-day complication rates between sleeve and gastric bypass, suggesting that sleeve is not a safer alternative in this population [18]. Hefler found an increased risk of 30-day complications, bleeding, and anastomotic leak in immunosuppressed patients also undergoing sleeve and gastric bypass but appeared to show worse outcomes in the bypass cohort [19]. While the long-term effect of bariatric surgery and weight loss may reduce the inflammatory state of certain rheumatic diseases [20], caution should be used in offering stapled operations to patients on chronic steroid immunosuppression, likely including duodenal switch.

### *15.2.6 Preoperative Weight Loss and Liver Volume Reduction*

The concept of a preoperative diet to reduce the liver volume and moderate the technical challenges of bariatric surgery is controversial. Risk reduction may be achieved with a preoperative liver volume reduction diet that may result in improved exposure of the gastric cardia and reduce the risk of bleeding from an oversized liver. Visceral adiposity may also be reduced [21]. Very low calorie diets (VLCD, 450–800 kcal/day) and low calorie diets (LCD 800–1200 kcal/day) have been studied. Van Nieuwenhove studied a 2-week VLCD in gastric bypass patients and found a decreased perception of difficulty of the surgery but no difference in bleeding or outcomes [22]. Edholm also found improvement in the perceived complexity of gastric bypass in 15 patients following a 4-week LCD and resulted in a reduction of liver volume by 12% as measured by MRI [23].

The optimal time and degree of caloric restriction is unknown. A systematic review concluded that VLCD are effective for volume reduction but found no association between degree of liver volume reduction and the length of a preoperative diet or degree of caloric restriction and that diets of <1500 kcal/day are likely sufficient for liver volume reduction [24].

It is also unclear if preoperative weight loss reduces postoperative complications. Ekici found no significant difference in early postoperative outcomes or weight loss at 1 year in patients having sleeve gastrectomy after a 4-week 1000 kcal/day diet [25]. A randomized trial of gastric bypass patients found no difference in bleeding or postoperative outcomes [22]. Tan also found no difference in postoperative complications in bypass and sleeve patients with <5% or >5% weight loss after a VLCD [26]. There may also be a detrimental effect to wound healing with a prolonged preoperative VLCD of 4 weeks [27].

While we do not know of any studies evaluating preoperative weight loss specifically in the duodenal switch population, there is likely at least some benefit to achieving liver volume reduction with a 2-week LCD to mitigate the technical challenges of an enlarged fatty liver, especially during the sleeve creation portion of the operation.

### *15.2.7 Hospital and Programmatic Support of Bariatric Surgery*

Surgery should be done within a comprehensive accredited bariatric program with access to nutritional consultation both pre and postoperatively and with adequate support staff to assist the patient in preparing for surgery and to monitor the patient in postoperative recovery. Additionally, surgery should be performed in a hospital setting with the resources to care for the inherent high-risk complexities of these morbidly obese patients. Some third-party payers require that these surgeries are performed in high-volume centers of excellence.

A plan should be made and literature provided to the patient that details all aspects of the postoperative recovery. In our practice, this includes educating the patient on the expected time they will be in the hospital recovering and how much time they should plan to be out of work while recovering at home. In our practice, this is generally 1–2 weeks, depending on the physical nature of their employment or daily activities. Additionally, we provide information on the postoperative diet, which involves liquids for 2 weeks, followed by a gradual advancement through pureed and soft foods over the course of weeks 3–6, and that emphasizes daily protein intake of 60–80 grams and avoidance of carbohydrate dense and fatty foods. Additionally, patients must have a firm understanding of the risk of malnutrition and short and long-term vitamin deficiency and the inherent need for and financial considerations of lifelong vitamin supplementation. In our practice, we require close follow-up after surgery at 1 and 6 weeks, 3, 6, 9, 12, 18, and 24 months, and then yearly thereafter and perform routine monitoring of both their weight loss and any side effects. We also engage in regular laboratory monitoring of hematologic, metabolic, and hepatic function and monitor vitamin and mineral levels. Patients must be committed to the time and travel burden necessary to make these follow-up appointments.

Maybe the most important aspect of risk reduction is a comprehensive experience and plan prior to surgery that addresses the technical challenges of the surgery including safe dissection and division of the duodenum, safe and reproducible anastomotic technique and efforts to streamline the operation to minimize operative time and increase efficiency. It is our opinion that this can be achieved by attending specialized training courses and lectures with experienced duodenal switch surgeons, practicing the technique in cadaveric models ahead of surgery and having an experienced proctor or assistant present during the early and crucial phases of the learning curve. It makes intuitive sense that a surgeon who decides to perform duodenal switch should have adequate experience in both sleeve gastrectomy and anastomotic weight loss surgery (e.g., Roux-en-Y gastric bypass) prior to adding duodenal switch to the surgical armamentarium offered to patients in his or her practice. Whether a single or double anastomosis procedure is performed, prior experience in sleeve creation and bowel anastomosis will be crucial in safely performing these technically advanced operations.

Despite every effort made to assess and reduce the risks to the patient of undergoing duodenal switch, operative and perioperative complications are inherent to the nature of surgery. We believe that giving informed consent of the risks of surgery is crucial to the ethical practice of surgery. Patients must understand the real risks of bleeding, anastomotic leak, stricture and ulcer, deep venous and mesenteric venous thromboembolism, incisional hernia, bowel obstruction, malnutrition, and even myocardial infarction, stroke, or death.

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