

ASMBS Guidelines

American Society for Metabolic and Bariatric Surgery: Preoperative Care Pathway for Laparoscopic Roux-en-Y Gastric Bypass

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In 2017, the American Society for Metabolic and Bariatric Surgery (ASMBS): Care Pathway Development for Laparoscopic Sleeve Gastrectomy (SG) was published in recognition of the importance of clinical care maps that guide evidenced-based healthcare, with a focus on value of the care delivered [1]. As part of this process, the Quality Improvement and Patient Safety Committee of the ASMBS sought to develop a care map for laparoscopic Roux-en-Y gastric bypass (RYGB). This current RYGB care map focuses solely on preoperative care, defined as the medical care and education provided to a patient from introduction into a bariatric program up to the day of surgery.

The goal of this document is to provide guidance and structure to clinicians and providers of bariatric surgery to improve healthcare delivery and quality. This pathway provides suggestions for patient education, laboratory

work-ups, comorbidity testing, evaluations, procedure decision-making, preoperative consults, preoperative medical weight loss, and prescribed diets in preparation for RYGB.

This pathway is not a systematic review, and expert opinion and society guidelines were incorporated during development. At times, the current state of practice was felt to evolve from the last society guideline publications or even from the *ASMBS: Care Pathway Development for Laparoscopic Sleeve Gastrectomy* [1], and more weight was given to expert opinions and group consensus rather than following prior guideline recommendations.

Disclaimer

Care pathways are issued by the ASMBS to serve as evidence-based guides for practitioners, derived from the scientific literature and expert opinion. Care pathways are not intended to replace the clinical decision-making of the physician or provider based on the unique aspects of each individual patient, and do not represent the “standard of care” in bariatric surgery. This care pathway disclaimer is applicable

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to all ASMBS care pathways issued by the ASMBS Quality Improvement and Patient Safety Committee [1].

Methodology

PubMed was queried for articles published from 1980 to May 2018 using the terms (((“Bariatric Surgery”[Mesh]) OR “Obesity/surgery”[Mesh]) OR “Gastric Bypass”[-Mesh]) AND ((“Perioperative Care/methods”[Mesh] OR “Perioperative Care/standards”[Mesh])) and returned 550 articles. Additional search terms used are included in [Supplementary Table 1](#). These articles were then reviewed for applicability to the key questions developed by the sub-committee members, and individual metrics of interest were selected for further analysis.

Articles were included if there was level 1 evidence, representing the findings of meta-analyses of randomized control trials (RCTs) or of an isolated RCT. If no articles met these criteria, level 2 evidence represented meta-analyses of non-RCTs, prospective cohort studies, or retrospective case-control studies. ASMBS consensus guidelines were also included for review and served as primary source articles. No cross-sectional studies, surveys, case series, or case reports were included in development of this pathway. The *ASMBS: Care Pathway Development for Laparoscopic Sleeve Gastrectomy* was also used for source references [1].

Categories for the pathway were categorized as “routine,” “selective,” or “not recommended.” “Routine” recommendations may have a high likelihood of providing objective results that can affect the procedure selection or outcome. “Selective” recommendations may be better applied in cases where patients have a known diagnosis of a medical condition or are at high clinical risk of a specific outcome. For “not recommended” items, there are data to demonstrate that the item may not affect outcomes in routine practice; however, these items could be appropriate on a case-by-case basis. If there were any considered metrics for the pathway by the authors that did not have the appropriate level of evidence or reach group consensus, these were designated as needing further research and are denoted with an asterisk (*).

Preoperative care pathway

Patient information and education

A patient education and informational session on bariatric surgery is routinely recommended for preoperative patients. The information provided in these seminars highlights surgical options for weight loss, the risks and benefits of surgery, obesity-associated diseases treated by bariatric surgery, expected outcomes, standard program requirements, and postoperative follow-up [1–3].

Laboratory studies

Information on laboratory studies is available in [Table 1](#) [1,3–7].

1. Routine laboratory studies:
 - a. Prior to surgery:
 - i. Complete blood cell count
 - ii. Basic metabolic panel
 - iii. Liver function tests
 - iv. Fasting glucose and glycated hemoglobin (HbA1c)
 - v. Calcium, vitamin D, and parathyroid hormone levels
 - b. Preoperatively:
 - i. Pregnancy test (females only, day of surgery)
 - ii. Repeat consult labs as needed based on initial values
2. Selective laboratory studies:
 - a. Prior to surgery:
 - i. Lipids (fasting)
 - ii. Albumin
 - iii. Folate as red blood cell folate or serum homocysteine
 - iv. Iron, ferritin, and total iron binding capacity
 - v. B12 (cobalamin) measured as methylmalonic acid
 - vi. Thiamine (B1)*
 - vii. Thyroid-stimulating hormone with reflex T4 for clinical suspicion of thyroid disease
 - viii. *Helicobacter pylori* stool antigen or serum antibody in high-prevalence areas
 - ix. Androgens (testosterone, dehydroepiandrosterone) for clinical suspicion of polycystic ovarian syndrome
 - x. Salivary cortisol for clinical suspicion of Cushing’s disease or syndrome
 - xi. Urine nicotine/cotinine or anabasine (if on nicotine replacement therapy), based on program or insurance requirements for cessation
 - xii. Vitamin A (measured as retinal binding protein)*
 - xiii. Vitamin E (measured as plasma α -tocopherol)*
 - xiv. Vitamin K (measured as des-gamma-carboxyprothrombin, DCP)*
 - xv. B6 (pyridoxine) as evaluation of anemia
 - xvi. Copper*
 - xvii. Ceruloplasmin*
 - xviii. Zinc*
 - b. Preoperatively:
 - i. International normalized ratio/prothrombin
 - ii. Type and screen
 - iii. Urinalysis
3. Laboratory studies not recommended:
 - a. Testing for rare causes of obesity (leptin deficiency or leptin receptor mutations or melanocortin-4

Table 1
Summary of RYGB preoperative laboratory evaluation recommendations

| Routine | Selective | Not recommended |
|---|---|---|
| <ul style="list-style-type: none"> •Basic metabolic panel •Calcium •Complete blood cell count •Fasting glucose and glycated hemoglobin •Pregnancy test (females only) •Liver function tests •Parathyroid hormone •Vitamin D | <ul style="list-style-type: none"> •Albumin •Androgens •B6 (pyridoxine) •Ceruloplasmin •Copper •Des-gamma-carboxypromthrombin •<i>Helicobacter pylori</i> stool antigen or serum antibody •International normalized ratio/prothrombin •Iron, ferritin, and total iron binding capacity •Lipids •Methylmalonic acid •Plasma α-tocopherol •Red blood cell folate or serum homocysteine •Retinal binding protein •Salivary cortisol •Thiamine (B1) •Thyroid-stimulating hormone with reflex T4 •Type and screen •Urinalysis •Urine nicotine/cotinine or anabasine •Zinc | <ul style="list-style-type: none"> •Leptin or receptor mutations •Melanocortin-4 receptor mutations |

RYGB = Roux-en-Y gastric bypass.

receptor mutations, among other rare syndromic obesity states) is not considered cost-effective for routine screening and should only be done with a very high index of clinical suspicion on a case-by-case basis [8].

Comorbidity testing and evaluations

Information on testing and evaluations of comorbidities is available in Table 2.

1. Routine comorbidity testing and evaluations:
 - a. *Obstructive sleep apnea screening.* Routine screening for obstructive sleep apnea (OSA) is recommended. Patients with clinical symptoms or

positive screening for OSA or obesity hypoventilation syndrome (OHS) could be referred for polysomnography. There are several commonly used and validated questionnaires that can be used as a screening tool to assess for high-risk obese patients. The first is the STOP-Bang score (Table 3), which can be used interchangeably with The Berlin questionnaire [9]. A STOP-Bang score of 4 has high sensitivity (88%), whereas a STOP-Bang score of 6 is highly specific (85.2%) for identifying severe OSA [10]. The Epworth Sleepiness Scale should not be used as a screening tool, as it is a symptom severity score and has poor correlation in the bariatric population for OSA detection. Routine polysomnography testing without screening is not recommended [9–13].

Table 2
Summary of RYGB preoperative testing and evaluation recommendations

| Routine | Selective | Not recommended |
|---|--|--|
| <ul style="list-style-type: none"> •Cardiovascular risk assessment •Malignancy screening •Obstructive sleep apnea screening •Venothromboembolic risk assessment | <ul style="list-style-type: none"> •Chest X-ray •Colonoscopy •Dual-energy X-ray absorptiometry •Electrocardiogram •Esophagogastroduodenoscopy •Manometry/pH testing •Polysomnography •Ultrasound •Upper gastrointestinal series | <ul style="list-style-type: none"> •Inferior vena cava filter |

Table 3
STOP-Bang Questionnaire

| Questions | Yes | No |
|--|-----|----|
| Snoring? Do you snore loudly (loud enough to be heard through closed doors or your bed-partner elbows you for snoring at night)? | | |
| Tired? Do you often feel tired, fatigued, or sleepy during the daytime (such as falling asleep during driving)? | | |
| Observed? Has anyone observed you stop breathing or choking/gasping during your sleep? | | |
| Pressure? Do you have high blood pressure ? | | |
| Body mass index more than 35 kg/m²? | | |
| Age older than 50? | | |
| Neck size large? Female ≥ 41 cm, male ≥ 43 cm (measured around Adam's apple) | | |
| Gender = male? | | |

- b. *Malignancy screening.* Routine cancer screening by a primary care provider or other relevant specialist should be considered for all bariatric surgery patients based on their age and individual risk factors. These screening tests should be done according to the current national guidelines. Currently, men should be screened for colon cancer at age 45 and prostate cancer at age 50 without risk factors. Women should be screened for cervical cancer by age 25, breast cancer at age 45, and colon cancer at age 45 without risk factors [14]. Although screening is recommended, it should not preclude an evaluation for and completion of bariatric surgery unless patients are symptomatic or other factors indicate these tests to be no longer screening but diagnostic in nature. [15,16]
- c. *Cardiovascular risk assessment.* Bariatric surgery is considered an intermediate or high-risk surgical procedure for perioperative cardiac events. Patients undergoing bariatric surgery should be screened for cardiovascular risks in the perioperative period, with a careful history and physical exam to identify the risk factors and identify patients who need a further cardiovascular work-up and preoperative assessment [3,17–24].
- d. *Venothromboembolic (VTE) risk assessment.** Bariatric surgery patients should have a risk assessment performed for VTE and should be considered for extended chemoprophylaxis postoperatively [25,26]. The risk assessment should include known risk factors for VTE after bariatric surgery, such as prior VTE, body mass index (BMI), age, gender, immobility, and expected operative time [26,27].
2. Selective comorbidity testing and evaluations:
- a. *Electrocardiogram.* An electrocardiogram may be considered for a cardiovascular risk assessment for

- bariatric surgery, with additional cardiac testing, such as an echocardiogram, done on a selective basis due to cardiovascular risk factors.
- b. *Chest X-ray.* A chest X-ray is recommended for patients with active or ongoing cardiopulmonary symptoms [17,19].
- c. *Polysomnography.* For patients who screen positive on assessment for OSA, formal polysomnography may be considered.
- d. *Esophagogastroduodenoscopy (EGD).* An EGD should be used on a selective basis prior to laparoscopic RYGB. Per the American Society for Gastrointestinal Endoscopy guidelines, an endoscopy is generally indicated if a change in management is probable based on the results of the endoscopy [28]. Therefore, a selective endoscopy could be considered for patients with upper abdominal, esophageal, or persistent gastroesophageal reflux disease (GERD) symptoms despite appropriate medical therapy and/or patients with symptoms suggestive of structural disease. While moderate and large hiatal hernias are more accurately detected by EGD, small hiatal hernias are often overdiagnosed with EGD and ultimately do not usually require surgical treatment or approach modification upon operative exploration [28]. An EGD can also be used to assess for *Helicobacter pylori* status. A routine EGD for detecting malignancy is not currently recommended prior to gastric bypass and has a yield of only .2%–.4% [29–32].
- e. *Upper gastrointestinal (UGI) series.* UGI may be considered selectively prior to RYGB. This could include patients with symptomatic GERD or those with a prior history of gastric surgery. They can be complimentary to EGD [33].
- f. *Manometry/pH testing.* High-resolution manometry and pH testing may be used selectively based on clinical symptoms, in the presence of esophageal motility disorders, and for patients with severe acid reflux despite the use of proton pump inhibitors [34,35].
- g. *Ultrasound.* Indications for abdominal ultrasound include symptoms of biliary tract disease, abnormal liver function tests, nonalcoholic fatty liver disease (NAFLD), and nonalcoholic steatohepatitis. Ultrasound has a global accuracy of 78% to detect NAFLD. The diagnostic accuracy for transient elastography (FibroScan) has also been described in patients with suspected NAFLD [36–38].
- h. *Colonoscopy.* Beyond national screening guidelines, a colonoscopy could be performed selectively in patients with unexplained abdominal symptoms, hematochezia/melena, iron deficiency of an

unknown cause, or a family/personal history of colonic pathology [16].

- i. *Preoperative dual-energy X-ray absorptiometry (DEXA)*. Preoperative DEXA could be used selectively in estrogen-deficient women and in premenopausal women and men who have conditions associated with bone loss or low bone density and are at risk for osteopenia and osteoporosis [39–41].
- 3. Comorbidity testing and evaluations not recommended:
 - a. *Inferior vena cava (IVC) filter placement*. The routine use of IVC filter placement is not recommended. Preoperative IVC filter placement may be considered in selected high-risk patient in whom the risks of VTE are determined to be greater than the significant risks of filter-related complications, for which there is not yet long-term safety data [26].

Procedure decision-making

The following patient characteristics and comorbidities were evaluated only on whether an RYGB should be offered as a preferred procedure over SG, as this represents 93% of all primary bariatric operations performed in 2018 (Table 4) [42]. These are general recommendations of when a procedure may be favored over another for a specific indication (such as type 2 diabetes); however, the ultimate decision for which procedure to perform should include not just 1 specific indication, but the entire health and well-being of the patient, including surgical risks, benefits, and patient preferences.

- 1. Recommended for consideration in procedure decision-making:
 - a. *Type 2 diabetes (T2D)*. * Indicators of diabetes severity (i.e., age, duration of T2D, preoperative fasting plasma glucose, and preoperative HbA1c) differentially predict glycemic control after RYGB and SG. Specifically, glycemic control after RYGB is affected by the preoperative duration of T2D and the presurgical HbA1c, while the baseline

BMI, duration of T2D, preoperative fasting blood glucose level, and preoperative HbA1c significantly affect glycemic control after SG. Therefore, fewer factors may need to be considered when RYGB is recommended to a patient with T2D [43,44]. When T2D patients are staged by disease severity, intermediate-stage patients (a score of 26 to 95 on the Individualized Metabolic Surgery score system) undergoing RYGB may have significantly better postoperative diabetes control than SG patients [45]. According to findings from the Diabetes Surgery Summit II, further research is still needed to determine whether RYGB is the preferred procedure over SG in patients with class 1 obesity [46].

- b. *Hypertension and dyslipidemia*. Resolution of hypertension, defined as a systolic blood pressure less than 140 mmHg and diastolic blood pressure less than 90 mmHg without antihypertensive medication, and resolution of dyslipidemia, defined as normal plasma lipid levels without medication, occurs after both RYGB and SG. However, both hypertension (odds ratio [OR] = 1.43; 95% confidence interval [CI], 1.15–1.77; *P* = .001) and dyslipidemia (OR = 2.40; 95% CI, 1.89–3.05; *P* < .00001) are more likely to resolve after RYGB [47,48]. Therefore, RYGB may be considered the procedure of choice in patients considering treatment of hypertension and dyslipidemia.
- c. *GERD*. RYGB is an effective operation for GERD. There is a marked improvement in symptoms of GERD with an objective decrease in pH-based parameters [49,50]. It is unclear whether 1 procedure is preferred for GERD-related quality of life. RYGB is frequently recommended to patients with GERD and severe obesity [51–53].
- 2. Selective for consideration in procedure decision-making:
 - a. *Older age*. * Older age should not be the sole reason to withhold surgery, given the equivalent efficacy to younger patients of RYGB in resolving and improving hypertension, T2D, OSA, and lipid abnormalities. Albeit a prospective study from a single academic center, RYGB demonstrated low absolute

Table 4
Summary of RYGB procedure decision-making

| Routine | Selective | Not recommended |
|--|---|---|
| <ul style="list-style-type: none"> •Dyslipidemia •Gastroesophageal reflux disease •Hypertension •Type 2 diabetes | <ul style="list-style-type: none"> •Chronic steroids or immunosuppressive therapy •High-dose aspirin •Inflammatory bowel disease •Older age •Transplant candidates or recipients •Younger age | <ul style="list-style-type: none"> •BMI limits •Body composition analysis •Chronic nonsteroidal anti-inflammatory drugs •Energy expenditure •Active and/or recurrent smokers |

RYGB = Roux-en-Y gastric bypass; BMI = body mass index.

mortality and morbidity rates after surgery; however, there was a 3-fold increase in mortality compared to patients <55 years old [54].

- b. *Younger age.* Based on new recommendations from the American Academy of Pediatrics, age should not be considered as part of the procedure decision-making process for children [55]. The 2018 ASMBS pediatric metabolic and bariatric surgery guidelines found there are no data to support bone age or a specific Tanner stage prior to surgery [56]. SG has become the most recommended operation in children due to excellent weight loss outcomes with lower perioperative risks and micronutrient deficiencies compared to RYGB [56]. However, RYGB is a potential option in children undergoing bariatric surgery based on patient/family preference and underlying comorbidities, as well as based on long-term medication compliance and follow-up [57].
- c. *Inflammatory bowel disease.** For patients with controlled ulcerative colitis, RYGB appears to be a safe and effective option without added morbidity and mortality compared to SG [58]. For patients with controlled Crohn's disease, due to the lack of small bowel manipulation, SG may be the preferred procedure [58]. However, given there is little available evidence on patients with obesity and inflammatory bowel disease undergoing RYGB, further research is needed.
- d. *Transplant candidates or recipients.** RYGB results in significant weight loss and resolution of obesity-related comorbidities in patients who are transplant candidates. Additionally, there is maintenance of immunosuppression and an absence of serious graft rejection or dysfunction, with an acceptable mortality rate of 2.6%. However, given the lack of high-quality studies, further research is needed to determine whether RYGB is the preferred procedure in transplant candidates or recipients [59].
- e. *Patients requiring high-dose aspirin.** Level 2 evidence suggests that there is no increased risk of marginal ulceration in patients with RYGB on low-dose aspirin; however, there are no high-quality studies on those requiring high-dose aspirin [60].
- f. *Patients requiring chronic steroids or immunosuppressive therapy.** The use of immunosuppressant medications increases the rate of early postoperative complications after bariatric surgery. In 1 national database study, RYGB did not carry a higher complication rate than SG in this patient population [61]. However, this has not been adequately studied to make a formal recommendation on procedure type. Further research is required.

3. Not recommended for consideration in procedure decision-making:

- a. *Body composition.* There is no evidence that bariatric surgery preferentially targets visceral fat versus subcutaneous fat. Therefore, a preoperative body composition analysis is not recommended routinely as a procedure decision-making tool, although it may have value in nutrition counseling [62].
- b. *Energy expenditure.* There is no evidence that preoperative indirect calorimetric data are predictive of weight loss postoperatively. Changes in energy flux and body composition were the same after both RYGB and SG. Therefore, preoperative energy expenditure should not be used routinely as a procedure decision-making tool, although it may have value in nutrition counseling [63].
- c. *BMI limits.* There is no level 1 or 2 evidence describing a weight range within which RYGB should be considered the surgery of choice over another bariatric procedure.
- d. *Patients on chronic nonsteroidal anti-inflammatory drugs (NSAIDs).* NSAIDs independently increase the incidence of and delay healing of marginal ulcers after RYGB [64]. For patients who will require chronic NSAID use postoperatively, especially in the absence of proton pump inhibitor usage, RYGB is not the procedure of choice.
- e. *Smoking.* Although smoking cessation is recommended for all bariatric patients prior to RYGB (see "Preoperative weight loss, diet, and lifestyle requirements" below), there may be some patients identified as being at high risk for smoking relapse postoperatively. Specifically, 61.7% of patients who smoked within 1 year prior to surgery were found to resume smoking postoperatively within 7 years [65]. For patients who are likely to resume smoking postoperatively, RYGB may not be the procedure of choice due to the substantial risk of marginal ulcer formation.

Preoperative consults

Information on preoperative consults is available in Table 5. Note that when specialized bariatric support services are unavailable, medical specialty services may be selectively used to support the bariatric program.

1. Routine preoperative consults:

- a. *Behavioral health assessment.* A presurgical psychosocial evaluation is recommended routinely before RYGB. Consultation with a behavioral medicine specialist for this evaluation could be utilized prior to bariatric surgery if available. Behavioral

medicine specialists can help patients manage psychiatric diseases and addictive behaviors, including tobacco and substance abuse [66–69]. Noncompliance with behavioral medicine recommendations has been associated with high program-dropout rates [3,70]. Psychosocial factors and adherence to the recommended postoperative dietary and lifestyle regimen have significant potential to affect postoperative outcomes [71]. Finally, deaths related to substance abuse and intentional self harm make up the majority of external causes of death after bariatric surgery. Early identification and intervention by behavioral specialists has the potential to prevent some of these deaths [72].

- b. **Registered Dietitian Nutritionist (RDN) consult.** A consultation with an RDN (licensed healthcare professional) is useful to identify preoperative nutritional deficiencies, as well as to evaluate a patient’s ability to incorporate nutritional changes before and after bariatric surgery. Recent nutritional guidelines recommend that all patients pursuing bariatric surgery undergo a preoperative clinical nutrition evaluation by an RDN. These guidelines also recommend including medical nutrition therapy for all bariatric patients as an essential component of comprehensive healthcare before and after bariatric surgery. Medical nutrition therapy provided by an RDN incorporates a systematic 4-step nutrition care process that includes: (1) a nutritional assessment; (2) diagnosis; (3) an intervention; and (4) monitoring and evaluation. These consultations may also be useful to identify eating disorders that can lead to postoperative noncompliance and morbidity [2–4,72–74].
2. Selective preoperative consults:
- a. **Anesthesia consult.** High-risk patients could have an anesthesia evaluation, preparation, and education visit scheduled prior to surgery. The evaluation could include an assessment of and management for intravenous access, monitoring, aspiration risk, postoperative nausea and vomiting, fluid

management, needed analgesia, and airway and ventilation management. Enhanced recovery pathways should be coordinated between the anesthesia and bariatric surgical teams [75–78].

- b. **Bariatric medicine consult.** Presented as grade D evidence in the 2019 update of the clinical practice guidelines for the perioperative nutrition, metabolic, and nonsurgical support of patients undergoing bariatric procedures, consultation with a bariatrician could be considered preoperatively [79]. The obesity medical specialist can assist in screening for preprocedure obesity-related complications, medical optimization, and planning for postoperative micronutrient supplementation. Bariatric medical specialists may have expertise in the management of diabetes, NAFLD, OSA, and other common bariatric comorbid conditions.
- c. **Cardiovascular consult.** A cardiovascular referral may be considered prior to surgery in patients with unstable coronary syndromes; a history of recent myocardial infarction with ongoing ischemic risk factors; unstable, severe, or mild angina; decompensated or compensated heart failure; significant arrhythmias; high-grade atrio-ventricular blocks; certain arrhythmias and severe valvular disease; diabetes mellitus and renal insufficiency; an abnormal ECG; a cardiac rhythm other than sinus; a low functional capacity; uncontrolled systemic hypertension and previous stroke; OSA with hypertension; exertional dyspnea; an evaluation for perioperative β -adrenergic blockade; significant family or personal cardiac disease; or any other condition for which the clinician feels a consultation is warranted [78].
- d. **Endocrinology consult.** An endocrinology consultation should be considered for those patients with poorly controlled hyperglycemia, in accordance with the American Association of Clinical Endocrinologists comprehensive care guidelines [80]. An HbA1c of $\leq 8\%$ is recommended for patients with long-standing T2D, diabetes-related complications,

Table 5
Summary of RYGB preoperative consults

| Routine | Selective | Not Recommended |
|---|---|-----------------|
| <ul style="list-style-type: none"> •Behavioral health assessment •Registered Dietitian Nutritionist | <ul style="list-style-type: none"> •Anesthesiology •Bariatric medicine •Cardiovascular medicine •Endocrinology •Gastroenterology •Hematology •Nephrology •Pain management •Pharmacist •Pulmonology/sleep medicine | n/a |

RYGB = Roux-en-Y gastric bypass.

and extensive comorbid disease where a lower target cannot be safely achieved due to hypoglycemia [3]. Although preoperative glycemic control is ideal, poorly controlled hyperglycemia should not necessarily preclude patients from undergoing an evaluation for and receiving bariatric surgery. In fact, 1 of the primary objectives of the procedure is often to control or eliminate hyperglycemia.

- e. *Gastroenterology consult.* A preoperative EGD may provide additional clinical information, as previously discussed in the “Comorbidity testing and evaluations” section. Alternatively, a small-caliber trans-nasal endoscopy could be utilized in an office setting. These can be performed by a credentialed bariatric surgeon or may prompt a gastroenterology referral [30,81–83]. Consultation with a gastroenterologist may be considered for those patients with severe gastrointestinal symptoms or NAFLD, to assist in preoperative optimization [84].
- f. *Hematology consult.* Patients with hypercoagulable conditions or factors that place them at high risk for a postoperative VTE could be referred to a hematologist for evaluation. A referral could also be considered in patients using anticoagulant medications. If available, a pharmacy-run coagulation clinic referral may be considered as an alternative.
- g. *Nephrology consult.* Patients with preexisting kidney disease, with end-stage renal disease, on hemodialysis, and who are renal transplant recipients could be considered for a preoperative nephrology evaluation.
- h. *Pain management consult.* Patients with chronic opioid use, dependence, or tolerance and those with anticipated needs for chronic pain management could be considered for preoperative consultation with a pain management specialist.
- i. *Pharmacist consult.* Patients with polypharmacy or on immunosuppressant, extended-release, and/or anticoagulation medications may receive a pharmacy referral to review medication transitions to appropriate liquid or crushed forms and rapid-release medications [85–88].
- j. *Pulmonary consult and sleep medicine consult.* Referral may be considered for an abnormal chest radiography, positive polysomnography, or history of intrinsic lung disease. Patients with clinical symptoms or positive screening (Positive Sleep Apnea Survey) for OSA or OHS could be referred to a sleep medicine professional for further evaluation.
- k. *Other specialists.* There may be multiple other specialists that can provide care to the preoperative RYGB patient on a selective basis, including orthopedics, neurology, infectious disease, rheumatology, and urology.

Preoperative weight loss, diet, and lifestyle requirements

Information on preoperative weight loss, diet, and lifestyle requirements is available in [Table 6](#).

1. Routine preoperative weight loss, diet, and lifestyle requirements:
 - a. *Preoperative high-protein, low-calorie diet.* Use of a high-protein liquid diet for 2 weeks preoperatively in patients with a BMI ≥ 40 kg/m² or >35 kg/m² with a weight-related comorbidity has been associated with reduced rates of postoperative complications in some studies and with no impact on future weight loss or outcomes in others [89,90]. For the purpose of liver volume reduction, a systematic review of low-calorie diets has shown a reduction in liver size by 2.4% per week [91]. Utilization of a high-protein, low-calorie diet for the goal of liver volume reduction may be recommended for patients with a BMI >35 kg/m² for as short a time period as 2 weeks prior to undergoing RYGB, but preoperative weight loss and adherence should not preclude the patient from moving forward with surgery [5,91].
 - b. *Smoking cessation.* Tobacco use should be avoided, and cessation of smoking is recommended prior to RYGB. Tobacco smoking is associated with increased risks of morbidity and mortality [92]. Cigarette smoking cessation at least 6 weeks preoperatively should be advised, with the aim of maintaining smoking cessation long term, as smoking is a known risk factor for anastomotic ulcer development in patients who undergo RYGB [3,64,93]. There is growing evidence that vaping and/or e-cigarettes also impose perioperative risks and are harmful [94]. In wound models, nicotine appears to negatively affect inflammation and proliferative wound healing. Although nicotine replacement therapy appears to be safe, conferring neither an advantage nor disadvantage with respect to perioperative outcomes or wound healing, further studies are needed [95]. High-quality studies evaluating the safety of the use of other nicotine-containing substances after RYGB do not exist, and these products should be avoided. Laboratory confirmation of smoking cessation prior to the operative procedure is at the discretion of the surgeon and bariatric program.
 - c. *Substance and alcohol abuse treatment.* * A preoperative psychosocial health evaluation should include screening for alcohol and substance abuse. There is not a consensus on use of a specific screening tool or clinical evaluation system, but the evaluation should include an assessment of the patient’s current and

Table 6
Summary of RYGB recommendations for preoperative weight loss, diet, and lifestyle recommendations

| Routine | Selective | Not recommended |
|---|---|---|
| <ul style="list-style-type: none"> •High-protein, low-calorie diet •Smoking cessation •Substance and alcohol abuse treatment | <ul style="list-style-type: none"> •Preoperative weight loss requirement | <ul style="list-style-type: none"> •Bowel prep •Case management review •Mandated medical supervised weight loss period |

RYGB = Roux-en-Y gastric bypass.

past use of alcohol and other substances [71]. If alcohol dependence or alcohol use disorder is present, a period of abstinence prior to metabolic and bariatric surgery should be considered [92]. It is recommended that patients with known or suspected substance abuse undergo a formal mental health evaluation prior to surgery [3]. Patients should be screened for marijuana use and encouraged to quit preoperatively. There is increasing availability of cannabinoid products without tetrahydrocannabinol and there are limited data on how these affect the post-RYGB physiology [96]. Recommendations for management of patients who use cannabis is an area requiring further research.

2. Selective preoperative weight loss, diet, and lifestyle requirements:
 - a. *Preoperative weight loss.* Preoperative weight loss should not be routinely required, as the literature does not consistently support an improvement in operative technical ease, a reduction in short- and long-term complication rates, or superior postoperative weight loss. A selective approach to preoperative weight loss may be considered, and the necessity should be determined by the surgical team for patients considered to be at higher risk (e.g., BMI > 50 kg/m², due to anticipated technical difficulty, or patients with diabetes, as preoperative weight loss can improve glycemic control) [3].
3. Preoperative weight loss, diet, and lifestyle requirements not recommended:
 - a. *Insurance-mandated diet period.* No high-quality studies exist supporting the use of an insurance-mandated, medically supervised time period of dieting beyond program-directed preoperative education and selective weight loss [97–99]. Designated time periods for medically supervised diets mandated by insurance carriers have not been shown to improve outcomes or follow-up and may present a barrier to care for patients.
 - b. *Bowel preparation.** No high-quality studies exist on the utility of bowel preparation before gastric bypass. Further research in this area is needed to be able to comment on the use of bowel preparation before RYGB.
 - c. *Case management review for discharge destination/readmission risk.** No high-quality studies exist

related to preoperative case management review for discharge destination/readmission risk. This is a potential future area for research.

Conclusion

This document can serve as a pathway to aid providers in the preoperative care of bariatric patients preparing for RYGB, with the goal of improving healthcare quality and surgical safety. There are multiple areas identified in this pathway that are in need of further investigation at the time of publication. Importantly, active research is needed to identify patients who will benefit from postdischarge chemoprophylaxis for VTE risk reduction after RYGB, to determine whether RYGB is the preferred metabolic procedure for patients with class 1 obesity and T2D, and to develop recommendations for the screening and management of patients who use cannabis.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.soard.2021.05.011>.

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