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# Bariatric Surgery in Adults: Patient Workup and Preparation

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***Authors' contributions***

*This work was carried out in collaboration among all authors. Author RK concept and planning of the manuscript. Author SR witting and compiling the manuscript and author MP managed the proof and final completion. All authors read and approved the final manuscript.*

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## ABSTRACT

With the advancement and industrialization of our society, the prevalence of metabolic disease is also increasing. Among the risk factors for metabolic syndrome and many other non-communicable diseases, obesity is the single most important one. Although life style and pharmacological therapies are the part of initial intervention, however once the overt obesity related complication appears, bariatric surgery becomes the only curative intervention. Various modalities surgeries have come into place in recent times. However preparing a patient physically and mentally needs a thorough pre- operative preparation. Here in this review, we are exploring the approach to patient with morbid obesity and work up for bariatric surgery from a physician's point of view.

*Keywords: Morbid obesity; bariatric surgery; metabolic syndrome; pre-operative work up.*

## 1. INTRODUCTION

Obesity has almost become a global health problem and obesity has been associated with numerous non-communicable diseases like diabetes mellitus, hypertension, cardiovascular diseases, cancers and degenerative joints diseases, depression, obstructive sleep apnea etc. It is also also associated with poor health outcomes [1]. Approximately two thirds of US

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population is overweight and out of this subset fifty percent falls in the category of obesity [2]. The NHS data published in 2020 shows that approximately 63% of UK population is either overweight or obese. There is an increase in the proportion of morbid obesity [3] in UK from merely 1% in 1993 to 3% in 2020.There is currently no available medical option to cure morbid obesity, bariatric surgery is the only option left for them to be effectively treated. Bariatric surgery has gained momentum in last few years due to its profound impact on reversing the metabolic parameters and sustained weight loss potential in morbidly obese patients, this amounts to reduced morbidity and mortality in these patients [4]. Bariatric surgery could be the most effective treatment for obesity and co-morbidities, often within days after surgery, independently of weight loss and it is actually the only therapy available for obesity which results in long-term, sustained weight loss. Probably, gut hormones might induce and mainten the weight loss to long-term, could determine the improvement of obesity-related co-morbidities and could help to detect new drug targets and improved surgical procedures [5]. However, obese patients have several comorbidities that increase the risk of any surgery; thus, prior to surgery, a preoperative workup is highly recommended [6]. Changes to long-term medication regimens after bariatric surgery should be anticipated and managed in an appropriate and timely manner [3]. The provided clinical practice recommendations might be used in conjunction with a patient's clinical picture to adjust chronic medication regimens in an appropriate and evidence-based manner after bariatric surgery [7].

## 2. ASSESSMENT OF PATIENTS FOR BARIATRIC SURGERY

Bariatric surgery is indicated for persons with morbid obesity according to SAGES (Society of American Gastrointestinal and Endoscopic Surgeons) guidelines, it defines morbid obesity when body mass index (BMI) is more than 40 without comorbidities, or a BMI between 35-39.9 with at least one comorbidity like diabetes, hypertension, sleep apnea or reduced quality of life. It is necessary to work up the patient thoroughly before taking them up for bariatric surgery, weight reduction surgery is obtainable through malabsorptive, restrictive, or combination of both approaches. The classical example of malabsorptive procedures are biliopancreatic and jejunoileal bypass are practically not performed these days. Table 1 delineates various surgical approaches and their clinical utility.

There are certain basic principals for work up of these patients, as per the American society for metabolic and bariatric surgery a battery of clinical and other tests are done to prepare patients for laparoscopic sleeve gastrectomy.

## 3. ROUTINE WORK UP FOR ALL PATIENTS IS AS BELOW

**Patient education:** It is considered to be the pillar for bariatric surgery outcome program. It focuses on patient's expectations from bariatric surgery, options of various surgical procedures, risks, complications and nutritional requirements should all be told to patients in detail.

**Laboratory studies:** Complete blood count, kidney function test, liver function test, fasting and post prandial blood sugar, HbA1c, TSH, PT with INR, aPTT, Vitamin B1, Vitamin B12, Vitamin D, urinalysis in all patients and urinary human chorionic gonadotropin (HCG) for females [8].

## 4. SCREENING

### 4.1 Diet

A calorie restricted diet is advised for these patients. Patients are preferably put on liquid diet approximately 1-2 weeks preoperative period, depending on case to case basis.

**Table 1. Showing surgical approaches and their clinical utility**

| Mechanism | Procedure | Clinical utility |
|---|---|---|
| 1.Absorptive | Jejunoileal bypass<br>Biliopancreatic bypass | Not much |
| 2.Restrictive | Vertical -banded gastroplasty<br>Adjustable gastric banding<br>Sleeve gastrectomy | Usual surgeries<br>Sleeve gastrectomy being most commonly performed |
| 3.Combination | Roux-en-Y | Limited |

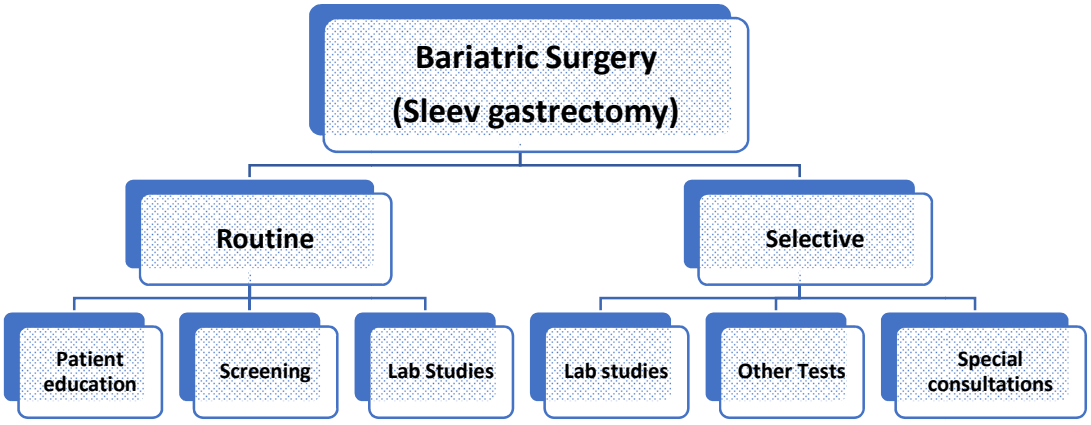


**Fig. 1. Showing the scheme of work up in bariatric surgery patients**

### 4.2 Functional Status

Preoperative functional assessment is an important predictor of surgical outcome [9]. Functional status can be judged by clinical assessment that are complemented by laboratory testing.

### 4.3 Obstructive Sleep Apnea (OSA)

It is mandatory to screen these patients for obstructive sleep apnea and those with symptoms be referred for polysomnography [10]. OSA is assessed by 8 point item STOP-Bang Questionnaire that stands for:

S = Snoring
T = Tired
O = Observed, has anybody observed you stop breathing /choking/gasping during sleep?
P = Pressure
B = BMI over >35
A = Age
N = Neck size
G = Gender: Male greater than female [11]

This assessment is important from anesthesia point of view. Obesity is related with 30% greater chances of failed intubation [12]. The Mallampatti scoring system is important in identifying patients at higher risk for failed intubation, it is based on the visibility of the base of uvula, faucial pillars, and soft palate and classifies patients into four classes. These structures are clearly visible in class 1 whereas class 4 has visibility with difficulty, hence class 1 and 2 are associated with easy intubation and classes 3 and 4 are associated with difficult intubation along with a neck circumference over 40 cm. Routine spirometry is reserved for patients with high risk.

### 4.4 Malignancy

A routine survey for cancer screening be done as per age/ sex of the patient.

### 4.5 Substance Use

Substances like nicotine in any form, alcohol, caffeine and medication needs a careful assessment. All patients be encouraged to give up smoking, for patients who are alcohol dependent must have abstinence for a year or two before surgery is taken up. All persons with non-alcoholic substance abuse should undergo a mental health evaluation and managed accordingly.

### 4.6 Cardiovascular

ECG is routinely done in patients planned for surgery, cardiopulmonary exercise testing and stress echocardiography is done once the ECG shows right ventricular enlargement. The treating physician must sought cardiology consult the moment patient is either suffering from unstable coronary syndrome, recent myocardial infarction with ongoing ischemic risk factors, angina,heart failure either stable or unstable, cardiac arrhythmias, high grade A-V block, severe valvular heart disease, diabetes mellitus and renal insufficiency,uncontrolled systemic hypertension, hypertension accompanied with obstructive sleep apnea syndrome [13].

### 4.7 Glycemic Control

Patients suffering from either typ1 or type 2 diabetes mellitus must have HbA1c values of 6.5-7% for optimal outcome of surgery, fasting blood sugar should be 110 mg% or less and post prandial blood sugar concentration of less than 140 mg%.

## 5. SELECTIVE WORK UP

### 5.1 Special Consultations

Gastroenterology consult is required in patients with severe symptoms of GERD/dyspepsia, similarly a patient at higher risk of deep venous thrombosis and venous thromboembolism should have his consultations by hematologist for hypercoagulable state. Patients who are suffering from renal failure is not a contraindication to bariatric surgery however those on maintenance hemodialysis, post renal transplant status, having uremic symptoms must be thoroughly evaluated and managed accordingly prior to taking them for bariatric surgery [14]. Patients who are chronic opioid use or dependence must have a pre-operative pain assessment for chronic pain management. Similarly a patient on polypharmacy must have appropriate referral to pharmacist for uninterrupted medications in liquid form or otherwise during perioperative period. Following team members are an integral part of bariatric surgery team (Fig. 2).

### 5.2 Special Tests

**Abdominal Ultrasonography:** All patients should undergo a preoperative abdominal ultrasound examination, there is controversy over prophylactic cholecystectomy in asymptomatic cases, however those having acute or chronic cholecystitis must have their gall bladder removed during bariatric surgery, as weight loss is invariably associated with clinical worsening in terms of symptomatology [15].

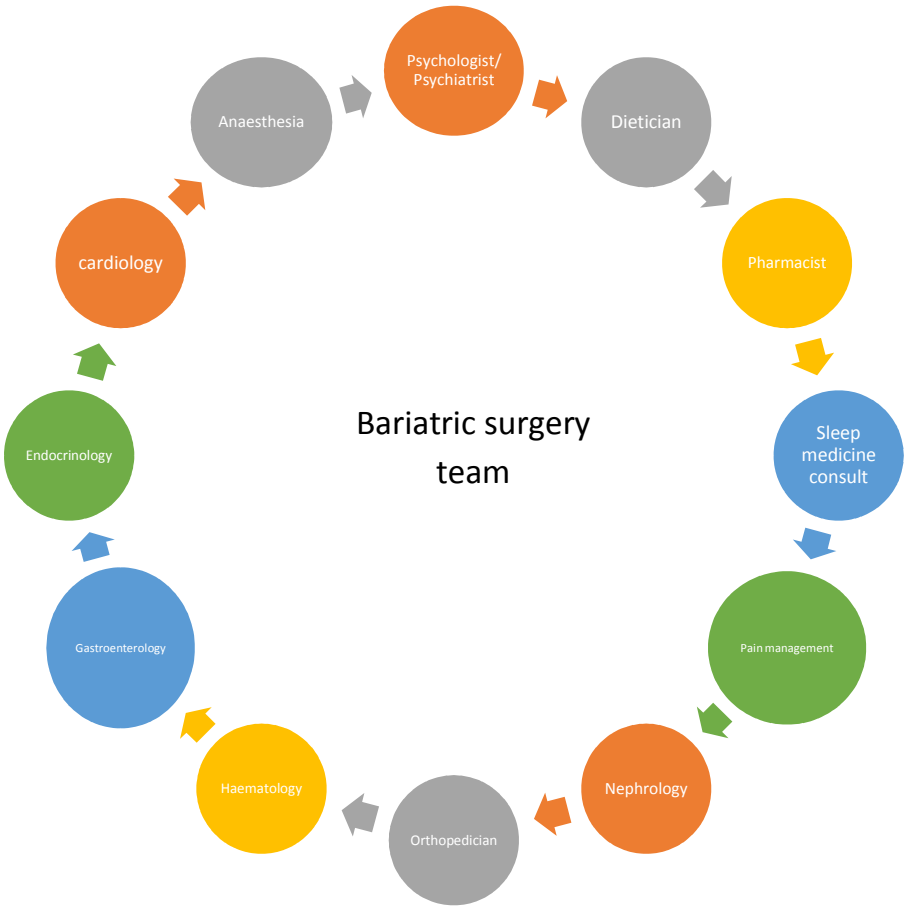


**Fig. 2. Showing the interdisciplinary component of comprehensive bariatric surgery team**

**Table 2. Investigations in selected group of patients**

| Investigation | Indication | Advantage | Disadvantage |
|---|---|---|---|
| Upper GI endoscopy | Upper GI symptoms [16] like GERD, regurgitation, heart burn dysphagia, patients on long term proton pump inhibitors/antisecretory agents Prior to sleeve gastrectomy | Can detect hiatus hernia, ulcers, tumors, might help surgeons in deciding approach to surgery | Invasive procedure |
| Barium contrast | Routinely not recommended, It is reserved for patients with prior gastric surgery or symptomatic patients | Radiographic sign of hiatus hernia and endoscopic sign of esophagitis is a relative contraindication for sleeve gastrectomy as there are increased chances of de novo GERD type symptoms. | Allergy to radiocontrast agent |
| DEXA | Only in selected patients like older females (>65yrs) or males (>70 yrs.) or in patients with conditions associated with low bone mass in order to establish a preoperative baseline<br>Patients planned for malabsorptive procedure [17] | Detection of reduced bone mass | Exposure to X-ray beam |
| Colonoscopy | Unexplained abdominal symptoms, hematochezia/melena or family/personal history of colonic pathology | Detects colonic lesions | Invasive procedure |
| Urine toxicology screening | To identify adherence to smoking cessation | Might pickup those patients who are actively smoking<br>Can be used as a supplement to patient's self-reporting of smoking cessation | Can't replace patient self-reporting of smoking cessation |
| Venous Ultrasound | Only for those who had past history of deep vein thrombosis, known or familial hypercoagulable state | Can be treated with LMW heparin if thrombosis found | Time consuming |

*These tests are reserved in case need arise in a particular patient*

## 6. IMMEDIATE PREOPERATIVE PREPARATION

Venous thromboembolic prophylaxis (VTE): Unfractionated or low molecular weight heparin (LMW) should be given immediately before induction of anesthesia, the LMW heparin has less bleeding propensity as compared to unfractionated heparin [18]. Apart from chemoprophylaxis mechanical prophylaxis should be considered in all high-risk patients.

## 7. CONTRAINDICATIONS OF BARIATRIC SURGERY

There are certain contraindications for bariatric surgery like

1. Major depression or mental illness
2. Patient unwilling with nutritional requirements and supplementation post bariatric surgery
3. Eating disorders
4. Severe coagulopathies
5. Cardiovascular risk
6. Anesthetic risk

A relative contraindication for sleeve gastrectomy procedure is GERD that can become worse after sleeve gastrectomy

## 8. CONCLUSION

Bariatric surgery is a promising therapy for cure of obesity in motivated patients who are adequately counselled for its advantages and disadvantages. There should be comprehensive assessment of these patients across the medical specialties for cardio-respiratory status, assessment for anesthesia and specialized tests only in selected group of patients. Patients adherence to lifestyle changes prior to surgery is a hallmark to successful outcome.

## CONSENT

It is not applicable.

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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