Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

SKU: 9781305628663-SOLUTIONS

Answer Guide for *Medical Nutrition Therapy: A Case Study Approach* 4th ed.
Case 2 – Bariatric Surgery for Morbid Obesity

I. Understanding the Disease and Pathophysiology

1. Define the BMI and percent body fat criteria for the classification of morbid obesity. What BMI is associated with morbid obesity?

- Body mass index (BMI) is usually used as a common method for determining if someone is obese since it is easy and quick. BMI>30 is considered obese.
- Obesity can be defined as a fat percentage greater than ≥25% fat in males and ≥33% in females. However, this requires tools and skill so BMI is more commonly used even though BMI does not factor in body composition. The National Institutes of Health do not recognize percent body fat as criteria for morbid obesity.
- BMI ≥40 is considered morbidly obese for both men and women
- BMI ≥ 35 plus one or more comorbid condition
- 100 lbs or more over IBW
- For children, obesity is defined using the CDC growth charts that provide BMI for age data. ≥ the 95th percentile or ≥30 kg/m^2 (whichever represents the lower weight) is considered an obese classification.
- The *Dietary Guidelines for Americans* have different classifications for obesity. Class 1 is a BMI of 30-34.9; class 2, a BMI of 35-39.9; and extreme obesity (class 3), a BMI ≥40 kg/m^2.
- Waist circumference can be used to determine mild obesity but it is a poor indicator of morbid obesity. A waist circumference >40 in. men or >35 in. in women indicates obesity or increased risk for CVD. This is based on the fact that central adiposity is thought to propose a higher risk for CVD than gynoid obesity.

2. List 10 health risks involved with untreated morbid obesity. What health risks does Mr. McKinley present with?

Risks with untreated morbid obesity include:

- Type 2 diabetes: 3× as prevalent among obese persons compared to those with normal weight
- Hypertension (high blood pressure): 3× more common in the obese
- Dyslipidemia (abnormal lipid profile, high cholesterol, low HDL, high LDL, high triglycerides)
- Gallstones: 6× greater risk for gallstones among persons who are obese
- Non-alcoholic fatty liver disease: central adiposity is a risk factor for NAFLD
- Cancer:
  - Men are at an increased risk for esophageal, colon, rectum, pancreatic, liver, and prostate cancers
  - Women are at an increased risk for gallbladder, bile duct, breast, endometrial, cervix, and ovarian cancers.
- Coronary heart disease
- Myocardial infarctions (heart attacks)
- Angina (chest pain)
- Sudden cardiac death
- Sleep apnea (inability to breathe while sleeping or lying down)
- Asthma
- Reproductive disorders:
  - Men: gynecomastia (enlarged mammary glands in males), hypgonadism, reduced testosterone levels, and elevated estrogen levels
  - Women: menstrual abnormalities, polycystic ovarian syndrome
- Metabolic syndrome
- Premature death: obese individuals have a 50-100% increased risk of premature death compared to healthy-weight individuals.
- Bone health: obesity can increase chances of osteoporosis or decreased bone mineral density

Health risks Mr. McKinley presents with:

- Osteoarthritis

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

- Type 2 diabetes
- Hyperlipidemia
- Hypertension
- Metabolic Syndrome (TG ≥ 150 mg/dL, HDL < 40 mg/dL, BP ≥ 130/85 mmHg; also highly likely that his FPG ≥ 100 mg/dL due to DM dx)
- Mr. McKinley has been obese his whole life, which puts him at an increased risk for type 2 diabetes, hyperlipidemia, hypertension, and osteoarthritis.

3. What are the standard adult criteria for consideration as a candidate for bariatric surgery? After reading Mr. McKinley's medical record, determine the criteria that allow him to qualify for surgery.

- The patient should be morbidly obese with a BMI ≥40 or...
- ...The patient should be obese with a BMI ≥ 35 and display a co-morbidity such as cardiovascular disease, sleep apnea, or diabetes.
- Surgery is an option when the patient has failed to lose weight by other, less invasive means or if the co-morbidities pose a significant health risk.
- However, many bariatric protocols require that a patient lose some weight prior to the operation to demonstrate that he or she is willing to follow through with lifestyle changes relating to exercise and diet.
- Mr. McKinley is a candidate for surgery because he is morbidly obese with a BMI of 59 (BMI >40) and he has several co-morbidities including: type 2 diabetes, hypertension, and hyperlipidemia.

4. By performing an Internet search or literature review, find one example of a bariatric surgery program. Describe the information that is provided for the patient regarding qualification for surgery. Outline the personnel involved in the evaluation and care of the patient in this particular program.

Internet search information is taken from:
http://www.obesityhelp.com/forums/vsg/about_vertical_sleeve_gastrectomy.html

Qualification information: for low-BMI individuals that should consider this procedure:

- Those concerned by long-term complications of intestinal bypass
- Those who are concerned about a lap-band, or inserting a foreign object into the abdomen
- Those who have other medical problems that prevent them from having weight-loss surgery such as anemia, Crohn's disease, extensive prior surgery, severe asthma requiring frequent steroid use, and other complex medical conditions
- People who need to take anti-inflammatory medications; VSG presents a lower risk for development of ulcers after taking anti-inflammatory meds after surgery

Personnel involved:

- Laparoscopic Associates of San Francisco (LAPSF)
- Obesityhelp.com
- "In more than 700 patients, there were no deaths, no conversions to open and a leak rate of less than 1%." (obesityhelp.com)
- Study showed that two-year weight-loss results from the vertical gastrectomy were similar to the roux-en-Y.
- 57% weight loss using the vertical gastrectomy compared to 41% for the lap-band procedure.
- This case is associated with a team of several doctors from LAPSF.

5. Describe the following surgical procedures used for bariatric surgery including advantages, disadvantages, and potential complications.

a. Roux-en-Y gastric bypass

Description:

- Most common restrictive-malabsorptive procedure.
- A small pouch is created at the top of the stomach, which restricts food intake by increasing satiety. The jejunum is cut at the distal end and is attached to the small pouch at the top of the stomach, which bypasses the rest of the stomach, the duodenum, and the first part of the jejunum in order to restrict digestion and absorption.

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

- The proximal end of the jejunum that is draining the stomach is surgically connected to the lower end of the jejunum, allowing for secretions from the liver, gallbladder and the pancreas to enter the jejunum to aid in digestion and absorption.

Advantages:
- Weight loss is achieved through this procedure by decreasing food intake, increasing satiety, and deceasing absorption.
- Dramatic improvements in diabetes, sleep apnea, hypertension, cancer, and cardiovascular disease risk.
- Potential 40% reduction in mortality.
- laparoscopic procedure, which is minimally invasive.

Disadvantages:
- Vitamin and mineral deficiencies; may need lifelong supplementation.
- Cannot take NSAIDs after surgery.
- Emotional and physical stamina are needed to be willing to make the necessary dietary and lifestyle changes.
- Nutrient deficiencies are more common because it is a restrictive-malabsorptive procedure, especially for fat-soluble vitamins (A, D, E, K), vitamin B_{12}, folate, iron, and calcium.
    - The stomach is being bypassed, which results in loss of intrinsic factor, which is necessary for B_{12} absorption.
    - The stomach provides acidity for iron absorption, which may be impaired following this procedure.

Potential complications:
- Development of gallstones, anemia, metabolic bone disease, osteoporosis
- Ulcers if patient smokes after surgery
- Nausea/vomiting if too much food is consumed
- Dumping syndrome (diarrhea, nausea, flushing, bloating from decreased transit time and from eating refined carbohydrates)

b. Vertical sleeve gastrectomy

Description:
- Up to 85% of the stomach is removed but leaves the pylorus intact and preserves the stomach's function.
- There is a tubular portion of the stomach between the esophagus and the duodenum, restricting remaining stomach's holding capacity to 50-150 mL.
- The surgeon places two rows of staples through both walls of the stomach and then cuts through both walls of the stomach between the lines of the staples, separating the stomach into two sections.
- Procedure causes a decrease in food intake by restricting the stomach's capacity and is considered a restrictive procedure.

Advantages:
- Minimal nutrient malabsorption.
- Removing part of the stomach results in a loss of the hormone ghrelin, which further enhances weight loss because ghrelin plays a role in hunger.
- Dumping syndrome is usually avoided by leaving the pylorus intact.
- Effective for weight loss in high-BMI candidates.
- Laparoscopic, which is minimally invasive.

Disadvantages:
- Weight regain is more possible because it does not involve intestinal bypass. Instead, it relies on a decrease in food intake.
- Procedure is not reversible.
- High-BMI candidates will most likely need a second procedure to aid in further weight loss. VSG acts as a beginning surgery.

Potential complications: Leaks related to the stapling procedure may occur.

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

c. Adjustable gastric banding (Lap-Band®)

Description:
- Silicone ring or band is laparoscopically introduced into the abdominal cavity and secured around the upper part of the stomach to create a small pouch with a narrow opening at the bottom of the pouch through which food passes into the rest of the stomach.
- The band restricts the stomach's capacity to as little as 30 mL.
- As time goes on, the band can be adjusted to increase the capacity of the stomach.
- The band is inflated with saline, which narrows the opening at the bottom of the pouch. This delays gastric emptying, allowing the patient to feel full longer.
- Most common restrictive procedure.

Advantages:
- Complications are least likely to result from AGB compared to other bariatric procedures.
- Hospital stay and post-op recovery are shorter than for the other procedures.
- Band can be adjusted to suit patient's caloric needs.
- Simple and the least invasive of the procedures.

- Potentially reversible, though challenging in clinical practice

Disadvantages: Patients lose weight at a slower rate than after restrictive-malabsorptive procedures such as the roux-en-Y gastric bypass procedure.

Potential complications: Risk of tear in the stomach during the operation; potential for nausea, vomiting, heartburn, and abdominal pain. The band may slip, which would require additional surgery.

d. Vertical banded gastroplasty

Description: Upper portion of stomach is stapled with a one-centimeter hole at the bottom of the pouch that allows for a very slow passage of food into the lower portion of the stomach. This procedure restricts overall oral intake due to the stomach's decreased capacity, aiding in weight loss.

Advantages:
- Simple, non-invasive.
- Procedure is reversible.
- Does not change the normal digestive pathways.

Disadvantages:
- Weight regain is possible because it does not involve intestinal bypass and the pouch may stretch over time. Instead, it relies on a decrease in food intake
- Breaking of staples.
- Nausea and vomiting if excessive amounts of food are consumed.
- May have difficulty digesting high-fiber foods.

Potential complications: Possible complications associated with surgery, infection, etc.

e. Duodenal switch

Description:
- Portion of stomach removed to reduce stomach's capacity and thus food intake.
- Pyloric valve stays intact to maintain normal digestion of nutrients.
- The intestinal pathway is re-routed to separate the flow of food from the flow of bile and pancreatic juices to inhibit absorption of energy-yielding nutrients.
- The pathways are then re-joined before the large intestine, bypassing a lot of the absorption in the small intestine.

Advantages:
- Keeping the pyloric valve intact reduces the risk for dumping syndrome.

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

- Significant weight reduction.

Disadvantages:
- More aggressive procedure, which means more complications associated with the procedure.
- Heavy dietary restrictions.

Potential complications:
- Leaks
- Blood clots
- Bowel obstruction
- Abscesses
- Kidney failure
- Bleeding
- Pneumonia
- Infection
- Osteoporosis
- Anemia
- Deficiencies of vitamin A, calcium, vitamin D, and protein

f. Biliopancreatic diversion

Description:
- Often performed with a duodenal switch
- Restrictive-malabsorptive procedure
- Least frequently performed
- Laparoscopically performed vertical sleeve gastrectomy
- Bypass of food through the intestine, resulting in more weight loss
- Distal part of the small intestine is surgically attached to the stomach
- Secretions from the liver, gallbladder, and pancreas are re-routed so they can eventually enter the small intestine to aid in digestion and absorption.

Advantages: Greatest amount of weight reduction

Disadvantages: Usually only performed on patients with BMI >50

Potential complications: See complications for duodenal switch

6. Mr. McKinley has had type 2 diabetes for several years. His physician shared with him that after surgery he will not be on any medications for his diabetes and that he may be able to stop his medications for diabetes altogether. Describe the proposed effect of bariatric surgery on the pathophysiology of type 2 diabetes. What, if any, other medical conditions might be affected by weight loss?

- Glucagon-like peptide 1 (GLP-1) and glucose-dependent insulinotropic peptide (GIP) stimulate insulin secretion. GLP-1 also suppresses glucagon and slows gastric emptying, which delays digestion and reduces postprandial glycemia. GLP-1 also acts on the hypothalamus to induce satiety. Bariatric surgery increases the levels of these hormones and are hypothesized to dramatically improve glycemic control post-operatively.
- Weight loss will improve insulin sensitivity and contribute to improved glycemic control.
- Bariatric surgery restricts food intake to a small portion of food at each sitting, which increases satiety and helps prevent hyperglycemia.
- Other conditions that may be affected by weight loss include cardiovascular disease. If hyperglycemia can be controlled, it may reduce the damage to the blood vessels, which aids in reducing risk of cardiovascular disease.
- Sleep apnea will be improved with weight reduction, as there is less mass around the respiratory muscles.
- Hyperlipidemia can be improved. As the patient eats more consistently with a decreased capacity, lipid profiles may begin to normalize as the patient loses weight.
- Blood pressure can be lowered with weight reduction, aiding in resolving hypertension.
- May reduce risk of cancer as obesity is linked with some forms of cancers

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

- May improve psychological health as obesity is associated with feelings of guilt, depression, anxiety, and low self-worth

II. Understanding the Nutrition Therapy

7. How does the Roux-en-Y procedure affect digestion and absorption? Do other surgical procedures discussed in question #5 have similar effects?

- Significant section of stomach bypassed, reducing gastric acid needed for promoting the ferrous state of iron (needed for absorption) and reduced intrinsic factor for B12 absorption
- Additionally, gastric acid is needed to cleave many minerals and vitamins from other molecular structures and promote their absorbable forms
- Duodenum and proximal jejunum bypassed, thus reducing the overall surface area and time for digestion and absorption
- Lactose intolerance may transiently occur due to the production of lactase in the removed part of the small intestine; adaptation can occur
- Deficiencies in fat-soluble vitamins (A, D, E, K), vitamin B_{12}, folate, iron, and calcium are common
- Other surgical procedures like the duodenal switch and biliopancreatic diversion may have similar effects due to their alterations in the GI tract pathways/release of digestive enzymes

8. On post-op day one, Mr. McKinley was advanced to the Stage 1 Bariatric Surgery Diet. This consists of sugar-free clear liquids, broth, and sugar-free Jell-O. Why are sugar-free foods used?

- Sugar-free foods are used to prevent dumping syndrome.
- Dumping syndrome is characterized by nausea, vomiting, bloating, and diarrhea and is caused by hyperosmolar foods, which are usually simple carbohydrates.
- The hyperosmolar foods cause water to be pulled into the intestine. This occurs because part of the intestine is bypassed and the pyloric sphincter is removed in the roux-en-Y procedure, which gives less surface area and transit time for absorption.
- In order to prevent dumping syndrome, the AND Nutrition Care Manual recommends avoiding simple carbohydrates such as fruit juices or other foods high in sugar.

9. Over the next two months, Mr. McKinley will be progressed to a pureed-consistency diet with 6-8 small meals. Describe the major goals of this diet for the Roux-en-Y patient. How might the nutrition guidelines differ if Mr. McKinley had undergone a Lap-Band procedure?

- Since roux-en-Y is a restrictive-malabsorptive procedure, it is important to consume very small meals, usually 2-4 Tbsp at one time, to decrease the risks of dumping syndrome. 6-8 small meals are needed because the stomach has a very limited capacity.
- Other major goals of the diet include:
  - Protein-dense foods (at least 60 g of protein per day); protein helps with the healing process after surgery and it helps with satiety so the patient can recognize that he/she is full before eating too much. Protein should be consumed first at the meal.
  - Avoid high-sugar beverages and foods. Liquids should be consumed between meals to avoid dumping syndrome (wait 30 min. after a meal). Meet a fluid goal of 48 to 60 oz (or more) per day. Initially, during the stage 1 and stage 2 diets, the recommendation is to consume at least 24 to 30 oz of clear liquids and at least 24 to 30 oz of full liquids; however, once the diet transitions to soft foods, the individual can continue consuming full liquids if he or she chooses but should consume at least 48 to 60 oz of clear liquids daily.
- If Mr. McKinley had a lap-band procedure, his risk for vitamin and mineral deficiencies would be lower because a lap-band procedure is restrictive but not a restrictive-malabsorptive procedure. A lap-band procedure simply reduces the size of the stomach without bypassing intestinal absorption. Dumping syndrome is not as significant of a concern; patients eased into larger-sized meals due to small pouch reservoir created within the stomach.
- In addition, the lap-band procedure is adjustable, so food intake can be suited to meet the patient's needs.

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

10. Mr. McKinley's RD has discussed the importance of hydration, protein intake, and intakes of vitamins and minerals, especially calcium, iron, and B_{12}. For each of these nutrients, describe why a deficiency may occur and explain the potential complications that could result from deficiency.

- ***Calcium:*** Since most of the stomach is bypassed, there is a reduction in the gastric acidity that aids in calcium absorption, causing potential deficiencies and risk of osteoporosis. Additionally, calcium salts can form due to the malabsorption of fatty acids.
- ***Iron:*** Iron is mostly absorbed in the duodenum of the small intestine. It also needs the acidity from the stomach, which is mostly bypassed in the roux-en-Y procedure, to aid in absorption. Therefore, iron may be malabsorbed and an iron deficiency may occur. Iron deficiency may lead to iron-deficiency anemia.
- ***B12:*** B_{12} is absorbed in the ileum, but it requires intrinsic factor, which is released from the stomach. The stomach is mostly out of commission, so the absorption of B_{12} is affected. B_{12} deficiency may lead to pernicious anemia and a folate deficiency.
- ***Protein:*** Since the stomach's capacity is very limited, the patient must restrict their food intake to about 2-4 Tbsp per meal. Protein should be taken first to help with satiety and to aid in healing after surgery. In case a person cannot tolerate the whole meal, it is important for protein-dense foods to be consumed so the person does not break down lean body mass when losing weight. Protein malnutrition may also lead to further edema and other micronutrient deficiencies.
- ***Hydration:*** Hydration is key but liquid should be consumed between meals to minimize dumping syndrome. Hydration goes hand in hand with protein intake. With risk of dumping syndrome, excess water could be lost from diarrhea, so it is important to stay adequately hydrated to prevent dehydration. In addition, as one loses weight, water weight will be lost, making hydration very important.

III. Nutrition Assessment

11. Assess Mr. McKinley's height and weight. Calculate his BMI and % usual body weight. What would be a reasonable weight goal for Mr. McKinley? Give your rationale for the method you used to determine this goal weight.

- BMI = 703 × 410 lbs/70 in./70 in.= 59
- % UBW = (410 lbs/434 lbs) × 100 = 95% UBW
- A reasonable weight goal would be to lose 30-35% of body weight within 1-2 years post-op.
  0.3 × 410 = 123 lbs, 410-123 lbs = 287 lbs.
  0.35 × 410 = 143.5 lbs., 410-143.5 = 266.5 lbs.
  Therefore, since research shows that most patients lose about 30-35% of their weight, it would be reasonable for Mr. McKinley to lose between 123 and 144 lbs. within the first two years.
- Studies demonstrate that 60% of patients typically maintain weight once weight is lost post-surgery.
- Another goal would be to get Mr. McKinley's BMI below 30, since evidence shows a significant reduction in the risk for co-morbidities associated with obesity when BMI is less than 30. This is equivalent to a goal weight <209 lbs.

12. After reading the physician's history and physical, identify any signs or symptoms that are most likely a consequence of Mr. McKinley's morbid obesity.

- Elevated blood pressure (135/90 mmHg): more strain on the blood vessels due to obesity
- Pitting edema
- Skin rash (impaired blood flow to the skin due to obesity)
- Elevated respiration rate: hard to breathe with excess weight compressing lungs and other respiratory muscles
- Diminished pulses may be due to excessive subcutaneous fat absorbing force of heart beat/observed pulse

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

13. Identify any abnormal biochemical indices and discuss the probable underlying etiology. How might they change after weight loss?

- ***Potassium (high):*** Serum potassium levels may be elevated post-surgery or could be an acid-base imbalance. It is most likely a result of post-operative status.
- ***CPK (high):*** CPK is an enzyme found in muscle tissue. When there is muscle damage, CPK levels may be elevate. This high concentration is likely a post-operative response.
- ***Glucose (high):*** Because of uncontrolled type 2 diabetes. Obesity contributes to uncontrolled blood glucose levels and obesity is a major risk factor for type 2 diabetes. Glucose values will probably decrease with significant weight loss.
- ***HbA_{1c} (high):*** Average blood glucose over 8-12 weeks. High due to uncontrolled diabetes. High blood glucose allows for more hemoglobin to be glycated with glucose. May improve or be lowered with weight loss and improved glycemic control.
- ***HDL (low):*** Obesity and some genetic profiles are positively associated with dyslipidemia, which would explain low HDL levels. HDL (high density lipoproteins) remove cholesterol from the body tissues and bring it back to the liver. Lower weight could potentially increase physical activity, as well, leading to increases in HDL.
- ***LDL (high):*** Obesity is associated with hyperlipidemia, which is why the cholesterol or lipid profile numbers are out of range. An alteration in lipid metabolism occurs in obesity, which may decrease the activity of the lipogenic enzyme that down-regulates LDL receptors. Lipid profiles tend to be normalized as individuals reach a more optimal weight.
- ***Triglycerides (high):*** Sources of serum triglycerides are either from dietary intake (transported by chylomicrons from the intestine) or from endogenous production by the liver. High serum levels will be either from excessive dietary fat and simple sugars or from an increased production and/or decreased clearance of lipoproteins transporting the triglycerides.).
- ***Cholesterol (high):*** Same reasoning as LDL and other lipid profile values. Value will probably decrease once weight loss is achieved.

14. Determine Mr. McKinley's energy and protein requirements. Explain the rationale for the method you used to calculate these requirements.

- Mifflin-St. Jeor used to calculate energy needs according to the Nutrition Care Manual under "bariatric surgery."
- RMR (men) = (9.99 × actual weight in kg) + (6.25 × height in cm) – (4.92 × age) + 5
  wt.= 410 lbs. or 410lbs./2.2 = 186 kg; ht. = 70 in. × 2.54 = 177.8 cm
  (186 kg × 9.99) + (6.25 × 177.8 cm) – (4.92 × 37 years) + 5 = 1858 + 1,111 – 182 + 5 = 2792 kcal × 1.3 (sedentary) = 3630 kcal.
- The Nutrition Care Manual uses actual body weight. However, due to a limited capacity of the stomach, ideal body weight could be used to lower calorie amounts.
  IBW = 166 lb. or 166/2.2 = 75 kg
  20-25 kcal per kg IBW weight × 75 kg = 1500-1875 kcal.
- Protein: Higher protein intakes may be warranted to help with the healing process after surgery. The RDA is 0.8 g/kg, or 1.0-1.2 g/kg for post-surgery until healed: 1.0-1.2 × IBW = 75-90 g protein/day.

IV. Nutrition Diagnosis

15. Identify at least two pertinent nutrition problems and the corresponding nutrition diagnoses.

- Nutritional problem post-surgery: After surgery, vitamin and mineral deficiencies are very common since the absorptive function of the GI tract is being altered by the roux-en-Y procedure.
  - Inadequate vitamin intake (B_{12}) related to decreased absorption as evidenced by reports of adequate vitamin B_{12} sources in diet with low serum levels.
- Another nutritional problem is the fact that the patient is obese.
  - Obesity related to excessive energy intake as evidenced by BMI of 59 (BMI >30).

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

- Another post-surgery problem may be that the patient may have a hard time consuming adequate protein because the stomach capacity is reduced but the protein needs are increased.
  - Inadequate protein intake related to recent altered absorption and digestion from recent surgery as evidenced by increased estimated protein needs of 75-90 g/day.
  - Nutrition-related knowledge deficit related to changes in diet due to recent RYGB surgery as evidenced by patient reports.

V. Nutrition Intervention

16. Determine the appropriate progression of Mr. McKinley's post-bariatric-surgery diet. Include recommendations for any supplementation that should be prescribed.

Post-bariatric surgery diet progressions may vary by institution but generally would include the following:
Details of the diet progression are listed here:

RYGB Diet	Begin	Fluids/Food/Supplements	Guidelines
Stage 1	Postop days 1 and 2	RYGB clear liquids: Noncarbonated, low kilocalories, low sugar, no caffeine, no alcohol	Postop day 1: patients undergo a UGI to test for leak; once tested, begin sips of RYGB clear liquids
Stage 2	Start postop days 2-3 for 2 weeks (discharge diet)	RYGB clear liquids: Variety of no-sugar liquids or artificially sweetened liquids Encourage patients to have salty fluids at home and solid liquids: sugar-free ice pops Plus RYGB full liquids: < 25 g sugar per serving in full liquids Protein-rich liquids (limit: 25-30 g protein per serving of added powders) Begin supplementation: Chewable multivitamin with minerals: 2 per day Chewable or liquid Calcium citrate with vitamin D: 1,200-1,500 mg/d Vitamin D: 3,000 IU/d (including what is in calcium supplement) Vitamin B-12 (sublingual): 350-500 mcg/d	Patients should consume ≥ 48-64 oz total fluids per day; ≥ 24-32 oz RYGB clear liquids; plus 24-32 oz any combination of full liquids: Low-fat (1%) or fat-free (skim) milk mixed with whey, whey isolate, or soy protein powder (limit: 25-30 g protein per serving) Lactose-free milk or soy milk mixed with soy protein powder Light yogurt, blended Plain yogurt; Greek yogurt
Stage 3: Week 1	Postop days 10-14[b]	Increase RYGB clear liquids (total liquids: ≥ 48-64 oz/d) and replace full liquids with soft, moist, diced, ground, or pureed protein sources as tolerated. Stage 3 protein sources: eggs; ground meats; poultry; soft moist fish; added gravy, bouillon, light mayonnaise to moisten;	Protein food choices are encouraged for 3-6 small meals per day; patients may be able to tolerate only a couple of

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

RYGB Diet	Begin	Fluids/Food/Supplements	Guidelines
		cooked beans; hearty bean soups; cottage cheese; low-fat cheese; yogurt.	tablespoons at each meal or snack. Mindful, slow eating is essential. Encourage patients not to drink with meals and to wait approximately 30 min after each meal before resuming fluid intake.
Stage 3: Week 2	4 wk postop	Advance diet as tolerated; if protein foods are well tolerated, add well-cooked, soft vegetables and soft and/or peeled fruit; always eat protein first.	Adequate hydration is essential and is a priority for all patients during the rapid weight loss phase; patients should be encouraged to add fruits/vegetables in a texture that is tolerated; full liquids may be used for meal or snack replacement.
Stage 3: Week 3	5 wk postop	Continue to consume protein with some fruit or vegetable at each meal; some people tolerate salads 1 mo to 6 wk postop.	Avoid rice, bread, and pasta until patients are comfortably consuming adequate protein per day and fruits/vegetables; consider diet as a "nutrition prescription" to meet nutrition needs during rapid weight loss and the healing phase; nutrition prescription: (1) adequate hydration; (2) 1-2 oz protein sources 3-5 times a day with fruit and/or vegetables; (3) post-WLS

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

RYGB Diet	Begin	Fluids/Food/Supplements	Guidelines
			supplementation; as weight stabilizes, hunger increases, and patients are meeting the DRI for protein and consuming fruits and vegetables, grains can be introduced.
Stage 4	As hunger increases and more food is tolerated	Healthy solid-food diet Vitamin and mineral supplementation daily[c]	Eat a healthy, balanced diet consisting of adequate protein, fruits, vegetables, and whole grains; energy needs are based on height, weight, and age.

Academy of Nutrition and Dietetics Nutrition Care Manual. Available from: https://www.nutritioncaremanual.org. Accessed: 10/24/2015.

17. Describe any pertinent lifestyle changes that you would view as a priority for Mr. McKinley.

- Incorporating physical activity into his daily routine will help with weight loss and will aid in correcting his lipid profile.
- He may need to change the types of foods he eats.
  - Concentrated sugars will need to be avoided post-surgery.
  - Smaller, more frequent meals may require a change in lifestyle/eating habits, since pt. will be eating 6 small meals rather than 3.
  - The patient will need to learn how to read the signals indicating fullness and stop eating to avoid nausea and vomiting. He must adjust to a very small stomach capacity and the decreased food intake this necessitates.
  - Once his stomach expands, lifestyle measures will need to be taken to practice control over serving sizes. Stomach stretches to size of a cup in about a year.
  - Follow up with bariatric health care team.
  - May have excess skin or other skin problems; subsequent procedures may be a option to consider.

18. How would you assess Mr. McKinley's readiness for a physical activity plan? How does exercise assist in weight loss after bariatric surgery?

- Mr. McKinley should adhere to an exercise routine that he enjoys.
- To assess readiness, see what he is willing to do and establish goals. Goals should be attainable, realistic, and concrete.
- Consider social support via group activities/teams/sports leagues and a personal trainer, as needed.
- Strenuous exercise should be avoided until he is healed, but walking should not be avoided.
- Physician should be consulted to discuss exercise options that are appropriate.
- Exercise will help maintain weight loss over time because after the weight is lost, Mr. McKinley will have to change his lifestyle to maintain weight loss.
- Exercise will help with chronic conditions such as obesity, hypertension (reduces BP), and diabetes. There is evidence that exercise improves insulin resistance.

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

- Once an exercise program is in place, Mr. McKinley will still have to follow up with a physician or exercise specialist to assess any medical problems associated with exercise such as chest pain, dyspnea, etc.

VI. Nutrition Monitoring and Evaluation

19. Identify the steps you would take to monitor Mr. McKinley's nutritional status postoperatively.

- Determine calorie needs post-surgery and adjust as stomach expands. Monitor how much patient is consuming or % of energy needs using a 24-hour recall or food diary. Volume should also be assessed since stomach capacity is reduced.
- Assess sugar intake. Patients should avoid concentrated sugars post-surgery, as it increases the risk of dumping syndrome.
- Determine if patient is complying with rules such as drinking liquid between meals instead of with meals.
- Assess any signs/symptoms of dumping syndrome that may be present, such as N/V, bloating, cramping, abdominal pain, or diarrhea. May need to consider intake/tolerance to lactose.
- Determine protein needs and make sure protein-dense foods are being consumed. Encourage high-protein snacks or supplements since protein is a major part of the healing process.
- Assess for vitamin and mineral deficiencies, particularly calcium, iron, B_{12}. B_{12} injections should be given and multivitamin supplementation is typically required for life.
- Assess weight loss per week. Patient should be recording changes in weight. Physical changes in skin and body contour should be evaluated. This is a big change in weight and patient will have to adjust clothing, etc. on a weekly basis to keep up with the weight loss. Calculations include: % weight loss, % IBW.
- Monitor diabetes, such as self-monitoring blood glucose practices, HbA_{1c} values to see if they are improved with weight loss.
- Monitor lipid profile to evaluate any improvements or other changes in cholesterol, TG, LDL, HDL after weight loss. These are all risk factors for CAD, so these values should be closely monitored.
- Evaluate potassium levels; sudden changes in potassium can cause cardiac arrest and since his value was high, this may be something to monitor.
- Evaluate hydration status. As weight loss is dramatic, it is important for patient to stay hydrated.

Recommended Laboratory Values to Monitor Preoperatively and Postoperatively

	Before Surgery	2 Months After Surgery	Month 6	Yearly
Lipid panel Kidney function Liver profile	✓	✓	✓	✓
Complete blood count, including fasting blood glucose level	✓	✓	✓	✓
Iron status • Serum folate • Ferritin • TIBC	✓	✓	✓	✓
Thiamin	✓	✓	✓	✓

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

• Cobalamin (vitamin B-12) • Methylmalonic acid (optional)	✓	✓	✓	✓
• Vitamin D, 25-OH • Serum calcium • PTH	✓	✓	✓	✓
Insulin	✓	As needed	As needed	As needed
Hemoglobin A1c	✓	✓	✓	✓
Phosphorus	✓	✓	✓	✓
Magnesium	✓	x	RYGB	RYGB
Vitamin A	x	x	x	Optional
Zinc	RYGB	RYGB	RYGB	RYGB
Copper	x	x	RYGB	RYGB
Selenium	x	x	RYGB	RYGB

Academy of Nutrition and Dietetics Nutrition Care Manual. Available from: https://www.nutritioncaremanual.org. Accessed: 10/24/2015

20. From the literature, what is the success rate of bariatric surgery? What patient characteristics may increase the likelihood for success?

- Most patients lose about 30-35% of weight in 1-2 years.
- Successful maintenance of weight loss is achieved by about 60% of patients who undergo bariatric surgery.
- Dramatic improvements in diabetes, sleep apnea, hypertensions, and CVD risk (up to 80% with diabetes experience its resolution).
- RYGB surgery has demonstrated a 40% reduction in mortality.
- Patient willingness and motivation to adhere to lifestyle changes help with weight loss and maintaining weight loss.
- Willingness to incorporate exercise and maintain exercise routine.
- Weight loss prior to surgery shows a commitment to lifestyle change.

21. Mr. McKinley asks you about the possibility of bariatric surgery for a young cousin who is 10 years old. What are the criteria for bariatric surgery in children and adolescents?

In children/adolescents, the following are criteria to be considered as a candidate for bariatric surgery:

- Failure to meet weight loss goals for greater than six months (goals are usually set up with primary care physician).
- Severely obese with a BMI >40, or > 35 with presence of co-morbities that could be improved with weight loss, and have attained a skeletal maturity for the most part (age 13 for girls and 15 for boys).
- Shows willingness to adhere to nutritional guidelines post-op.
- Undergone psychological evaluation that shows he/she can handle the emotional effects of surgery.
- Must possess decision-making capabilities.

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

22. Write an ADIME note for your inpatient nutrition assessment with initial education for the Stage 1 and 2 (liquid) diet for Mr. McKinley.

2-23-2012 (1:30 pm) – Roux-en-Y gastric procedure nutrition follow-up
Chris McKinley
A: 37 YOWM, Dx: morbidly obese. PMH: type 2 diabetes, hypertension, hyperlipidemia, osteoarthritis
Meds: Metformin 1000 mg/twice daily; 35 u Lantus pm; Lasix 25 mg/day; Lovastatin 60 mg/day
Skin: warm, dry, intact
Abdomen: Obese, rash present under skinfolds, BSx4
I/O: + 2200, -2230 mL, net: -30 mL
Labs: HbA_{1c} 7.2%, glucose 145, LDL 232, HDL 32, TG 245, cholesterol 320, K^+ 5.8, urinalysis: WNL
Ht. = 5' 10" Wt.: 410 lbs. highest wt.: 434 lbs., % UBW: 95%, BMI: 59; IBW 166 +/-10#
Estimated energy requirements: 1500-1900 kcal (20-25 kcal/kg IBW)
Estimated protein requirements: 90-113 g protein (1.2-1.5 g/kg/IBW)
Diet Hx: Not available. Current diet: clear liquids, post-bariatric surgical diet.

D: nutrition-related knowledge deficit related to diet changes from recent roux-en-Y gastric bypass as evidenced by patient reports.

I: Goals:

1. Restrict calorie intake to accommodate for decreased stomach capacity to facilitate weight loss.
   - Phase 1: Clear liquid diet Post-operative day 1 and 2
     - Sugary clear liquids should be avoided to prevent dumping syndrome.
     - Patient should consume water, broth, unsweetened beverages such as sugar-free apple juice.
     - Stomach capacity is at about 30 mL maximum at each meal of clear liquids.
   - Phase 2: Full liquid diet (2 weeks)
     - ≥ 48-64 oz total fluids per day; ≥ 24-32 oz. no sugar clear liquids; plus 24-32 oz. any combination of full liquids
   - Advance to appropriate progression through stages 3 and 4.

2. Patient will begin exercise regimen after consultation with physician or exercise specialist.

M/E: 1. Follow-up appointment will be scheduled with health care team.
2. Monitor labs: lipid panel, BUN, Cr, serum electrolytes, CBC, glucose, HbA1c, thiamin, B12, Vitamin D, Vitamin A, zinc, copper, selenium.
3. Monitor weight loss percentage and the rate of weight loss
4. Monitor patient's adherence to exercise regimen

Signed.

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

Questions for *Medical Nutrition Therapy: A Case Study Approach* 5th ed.
Case 2 – Bariatric Surgery for Morbid Obesity

Instructions: Answer the questions below. You may print your answers or e-mail them to your instructor.

1. Define the BMI and percent body fat criteria for the classification of morbid obesity. What BMI is associated with morbid obesity?

2. List 10 health risks involved with untreated morbid obesity. What health risks does Mr. McKinley present with?

3. What are the standard adult criteria for consideration as a candidate for bariatric surgery? After reading Mr. McKinley's medical record, determine the criteria that allow him to qualify for surgery.

4. By performing an Internet search or literature review, find one example of a bariatric surgery program. Describe the information that is provided for the patient regarding qualification for surgery. Outline the personnel involved in the evaluation and care of the patient in this particular program.

5. Describe the following surgical procedures used for bariatric surgery including advantages, disadvantages, and potential complications.

    a. Roux-en-Y gastric bypass

    b. Vertical sleeve gastrectomy

    c. Adjustable gastric banding (Lap-Band®)

    d. Vertical banded gastroplasty

    e. Duodenal switch

    f. Biliopancreatic diversion

6. Mr. McKinley has had type 2 diabetes for several years. His physician shared with him that after surgery he will not be on any medications for his diabetes and that he may be able to stop his medications for diabetes altogether. Describe the proposed effect of bariatric surgery on the pathophysiology of type 2 diabetes. What, if any, other medical conditions might be affected by weight loss?

7. How does the Roux-en-Y procedure affect digestion and absorption? Do other surgical procedures discussed in question #5 have similar effects?

8. On post-op day one, Mr. McKinley was advanced to the Stage 1 Bariatric Surgery Diet. This consists of sugar-free clear liquids, broth, and sugar-free Jell-O. Why are sugar-free foods used?

9. Over the next two months, Mr. McKinley will be progressed to a pureed-consistency diet with 6-8 small meals. Describe the major goals of this diet for the Roux-en-Y patient. How might the nutrition guidelines differ if Mr. McKinley had undergone a Lap-Band procedure?

10. Mr. McKinley's RD has discussed the importance of hydration, protein intake, and intakes of vitamins and minerals, especially calcium, iron, and B_{12}. For each of these nutrients, describe why a deficiency may occur and explain the potential complications that could result from deficiency.

11. Assess Mr. McKinley's height and weight. Calculate his BMI and % usual body weight. What would be a reasonable weight goal for Mr. McKinley? Give your rationale for the method you used to determine this goal weight.

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

12. After reading the physician's history and physical, identify any signs or symptoms that are most likely a consequence of Mr. McKinley's morbid obesity.

13. Identify any abnormal biochemical indices and discuss the probable underlying etiology. How might they change after weight loss?

14. Determine Mr. McKinley's energy and protein requirements. Explain the rationale for the method you used to calculate these requirements.

15. Identify at least two pertinent nutrition problems and the corresponding nutrition diagnoses.

16. Determine the appropriate progression of Mr. McKinley's post-bariatric-surgery diet. Include recommendations for any supplementation that should be prescribed.

17. Describe any pertinent lifestyle changes that you would view as a priority for Mr. McKinley.

18. How would you assess Mr. McKinley's readiness for a physical activity plan? How does exercise assist in weight loss after bariatric surgery?

19. Identify the steps you would take to monitor Mr. McKinley's nutritional status postoperatively.

20. From the literature, what is the success rate of bariatric surgery? What patient characteristics may increase the likelihood for success?

21. Mr. McKinley asks you about the possibility of bariatric surgery for a young cousin who is 10 years old. What are the criteria for bariatric surgery in children and adolescents?

22. Write an ADIME note for your inpatient nutrition assessment with initial education for the Stage 1 and 2 (liquid) diet for Mr. McKinley.

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual

Nutrition Diagnoses Correlations for *Medical Nutrition Therapy: A Case Study Approach* 5th ed.

Table 1: Nutrition Diagnoses Covered in Each Case

Case	Nutrition Diagnoses	
1 Pediatric Weight Management	Overweight, adult or pediatric	NC-3.3.1
	Excessive energy intake	NI-1.3
	Physical inactivity	NB-2.1
	Undesirable food choices	NB-1.7
	Food and nutrition-related knowledge deficit	NB-1.1
2 Bariatric Surgery for Morbid Obesity	Inadequate vitamin intake	NI-5.9.1
	Overweight, adult or pediatric	NC-3.3.1
	Inadequate protein intake	NI-5.7.1
	Food and nutrition-related knowledge deficit	NB-1.1
3 Malnutrition Associated with Chronic Disease	Inadequate oral intake	NI-2.1
	Increased energy expenditure	NI-1.1
	Inadequate fluid intake	NI-3.1
	Malnutrition	NI-5.2
	Inadequate protein-energy intake	NI-5.3
	Inadequate protein intake	NI-5.7.1
	Unintended weight loss	NC-3.2
4 Hypertension and Cardiovascular Disease	Excessive energy intake	NI-1.3
	Excessive fat intake	NI-5.6.2
	Less than optimal intake of types of fats	NI-5.6.3
	Inadequate fiber intake	NI-5.8.5
	Inadequate mineral intake	NI-5.10.1
	Excessive mineral intake (sodium)	NI-5.10.2
	Altered nutrition-related laboratory values	NC-2.2
	Overweight, adult or pediatric	NC-3.3.1
	Limited adherence to nutrition-related recommendations	NB-1.6
	Undesirable food choices	NB-1.7
5 Myocardial Infarction	Suboptimal bioactive substance intake	NI-4.1
	Food-medication interaction	NC-2.3
	Food and nutrition-related knowledge deficit	NB-1.1
6 Heart Failure with Resulting Cardiac Cachexia	Inadequate oral intake	NI-2.1
	Inadequate enteral nutrition infusion	NI-2.3
	Altered nutrition-related laboratory values	NC-2.2
7 Gastroesophageal Reflux Disease	Excessive energy intake	NI-1.3
	Undesirable food choices	NB-1.7
	Excessive fat intake	NI-5.6.2
	Excessive mineral intake (sodium)	NI-5.10.2
	Overweight, adult or pediatric	NC-3.3.1
	Altered nutrition-related laboratory values	NC-2.2
	Food and nutrition-related knowledge deficit	NB-1.1
	Physical inactivity	NB-2.1
8 Gastroparesis	Altered GI function	NC-1.4
	Increased nutrient needs	NI-5.1
	Unintended weight loss	NC-3.2
	Malnutrition	NI-5.2

© 2017 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website for classroom use.

Medical Nutrition Therapy A Case Study Approach 5th edition Nelms Solutions Manual