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Nutrition Care Plan #2
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Dietetic Intern
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Introduction to SR

SR is a 78 year old male admitted for an exploratory laparoscopic partial gastrectomy resection revision, Bill Roth II to Roux-en-Y, with a partial bowel resection due to a gastric mass. Pt has a history of a partial gastrectomy (Bill Roth II) at age 18, acute gastroenteritis, DM, HTN, TIA, GERD, anxiety, and dyslipidemia.

Food and Nutrition History

Food Recall

Pt reports a usual diet of three meals per day, listed below. Pt stated he does not eat a lot, and eats slowly. Pt's daughter stated his appetite has decreased recently, possibly due to the gastric mass. Estimated needs were calculated to be 1341-1610 kcal (25-30 kcal/kg) and 60-80 g protein (60 g minimum, goal of 1.5 g/kg).

	Breakfast	Lunch	Dinner	Totals
Food Items	2 slices wheat toast, 4 oz juice or 2 eggs, scrambled, 1 slice toast	Sandwich: 2 slices wheat bread, ham or turkey, lettuce, tomato, mayonnaise, fruit (varies)	Pasta or potatoes, fish, chicken, or steak, vegetables	
Kcal	220 - 340 kcal	365 kcal	485 kcal	1070-1190 kcal
Pro	6-23 g	20 g	29 g	55-72 g
Carb	30 g	45 g	30-45 g	105-120 g
Fat	2-15 g	13 g	11 g	26-39 g

(Based on Diabetic Exchanges)

Nutrition knowledge and practices

SR states that he watches his carbohydrate intake since he has DM. Pt's daughter states that his blood glucose levels are usually fairly well controlled with his oral medication and diet.

Physical Activity

Pt states that before this admission, he was fairly active. Pt stated he drove, went shopping, and walked frequently. Pt stated he is looking forward to moving around more again once he is recovered from the surgery.

Food Availability

SR lives with one of his daughters. Pt's daughter is his main care taker and states there are no issues with food availability.

Biochemical data

Labs

Date	Calcium (8.5-10.1 mg/dL)	Glucose (70-99 mg/dL)	POC Glucose (70-99 mg/dL)	Iron (35-150 micro grams/dL)	Hgb (14.6-17.5 g/ldL)	MVC (78-93 cubic microns/RBC)
7/5/13	-	-	179*, 302*, 186*, 176*	-	-	-
7/6/13	-	-	199*, 198*, 174*, 152*, 101*, 86, 108*	-	10.4*	76.8*
7/7/13	8.0*	92	102*, 116*, 116*, 118*, 174*	-	8.8*	77*
7/8/13	8.3*	111*	122*, 168*, 108*, 197*	-	8.7*	76.1*
7/9/13	-	-	62*, 137*, 158*, 195*, 151*, 204*	-	8.3*	75.9*

Date	Calcium (8.5-10.1 mg/dL)	Glucose (70-99 mg/dL)	POC Glucose (70-99 mg/dL)	Iron (35-150 micro grams/dL)	Hgb (14.6-17.5 g/ldL)	MVC (78-93 cubic microns/RBC)
7/10/13	8.3*	117*	140*, 201*, 181*	-	8.6*	75.1*
7/11/13	-	-	254*	-	8.8*	75.5*
7/12/13	-	-	202*, 135*, 220*, 193*	22*	9.8*	74.5*
7/13/13	8.7	94	259*, 92, 274*, 156*, 161*	-	8.4*	75.3*
7/14/13	-	-	155*, 225*, 130*, 199*	-	-	-
7/15/13	8.6	137*	187*	-	7.6*	75.5*

SR had few abnormal lab values. This pt has a history of DM and at home takes an oral medication to help control glucose levels. The pt stated his blood glucose levels usually run around 120 mg/dL. During his stay here, SR's average POC glucose level was 174 mg/dL. PTA, SR was asked to stop taking his oral hypoglycemic medication in preparation for his surgery. On admission, SR was started on sliding scale insulin. On July 11th, SR was able to restart taking his oral medication for DM. Although SR was on insulin and/or oral medication to control his DM during this hospitalization, his blood glucose levels were not adequately controlled.

One possible explanation for the abnormal glucose levels could be the patient's diet during his stay. Post surgery, SR had a very limited intake due to the size of his stomach, inflammation due to surgery, and the progression of the diet. SR was started on clear liquids on POD 2. On clear liquids, SR had an average intake of only 25-49% of

meals according to Alexicare. These clear liquid meals usually consisted of two items such as soup and Jell-o. The type of clear liquid item chosen could also affect the pt's blood glucose values. Sugar-free jell-o will not increase blood glucose levels like regular Jell-o will. SR was not on a consistent carb diet while on clear liquids or full liquids.

SR's diet was advanced to full liquids, and finally mechanical ground/soft. Once SR was started on a full liquid diet, he was provided with a Glucerna 8 oz shake TID. While the Glucerna is a carbohydrate controlled supplement, it is still providing more carbohydrates than he was previously consuming. However, the pt's average meal intake per Alexicare was still 25-49%. SR's low intake could have also caused his blood glucose levels to rise. Skipping meals, or not eating enough carbohydrates, may cause a rise in blood glucose levels as a way to counteract the low intake of carbohydrates.

SR also had low calcium levels. These abnormal values could be caused by the change in GI structure and thus a decrease in calcium absorption. On July 11th, a multivitamin complex was added to his diet, which could account for the increase in Ca lab values.

On July 11th, SR was diagnosed with microcytic anemia due to hemoglobin and MCV levels per MD note. These levels could have been low due to blood losses during surgery. Iron supplements were subsequently started. On July 12th, the pt's iron levels were checked and found to be low. Iron deficiency is a common cause of microcytic anemia. Similar to calcium absorption, iron absorption is decreased by the change in GI structure and thus iron supplementation is needed. The value was not retested during this admission. After the addition of an iron supplement, hemoglobin and MCV labs did not improve, suggesting an alternate reason for these low levels.

SR's abnormal lab values influence the supplements that I recommend. The pt's abnormal glucose levels influenced my choice of Glucerna as a protein and calorie supplement drink. Glucerna is designed to have minimal carbohydrates while still providing extra protein and calories for pt's with DM who need to control their carbohydrate intake. This pt's abnormal calcium and iron levels could be evidence supporting the need for calcium and iron supplements as suggested by practice guidelines for gastric bypass surgery.

Tests and Procedures

1. Revision of Bill Roth II, partial gastric resection, partial small bowel resection, Roux-en-Y gastrojejunostomy (7/5/13) due to gastric adenocarcinoma and GERD. Pt's antrum stomach had previously been removed with a Bill Roth II and looped gastrojejunostomy. The gastric mass was present at the previous gastrojejunostomy anastomosis. No apparent metastasis to liver or peritoneum. The more distal portion of the stomach was connected to the anti-mesenteric side of the bowel.
2. Gastrografin upper GI X-ray (7/7/13) due to post-operation day 2. Results compared to CT of abdomen from May 31, 2013. The small caliber of the stomach is consistent with the partial resection. No abnormal contrast discharge identified. Gastroesophageal reflux was identified to the cervical esophagus level.
3. Acute Abdominal Series (7/12/13) due to abdominal pain and tenderness. Findings: Some residual contrast in ascending colon and transverse colon. No bowel obstruction. No organomegaly. Possible left lower lobe infiltrate and left upper lobe scarring or atelectasis.

Anthropometrics

Height: 5'4" ABW: 118 lbs UBW: around 130 lbs

BMI: 20.25

ABW based on admission weight from 6/25/2013. Pt was not reweighed. Pt was unsure of the last time he weighed his UBW of 130 lbs. The earliest weight recorded in his chart is 127 lbs from 3/27/2012.

Weight loss PTA: 9 lbs in 1.5 years (7%) based on admission weights.

Physical Exam Findings

Per MD and RD physical exams, SR appears to be thin, but well-nourished. No apparent muscle wasting, although minimal subcutaneous fat present. Pt has all of his own teeth, no chewing difficulties or sensitivities noted. Pt is alert x3 with a normal mood and affect.

Due to loss of subcutaneous fat, SR could be classified as having mild malnutrition.

Client History

Medical and Social History

The pt has a history of a partial gastrectomy (Bill Roth II) at age 18 for ulcers, DM, HTN, TIA, GERD, anxiety, and dyslipidemia. Pt has recent diagnosis of microcytic anemia on this admission. Family medical history is noncontributory to current medical status per H&P. Pathology from the biopsy of the gastric mass demonstrates a well-differentiated adenocarcinoma, intestinal type, that is invasive to the serosa without penetration into the serosa. Lymphovascular invasion was also present with one regional lymph node positive for mets. Distant metastases could not be assessed

currently, although a previous CT scan of the abdomen and a chest x-ray both taken in May 2013 showed no evidence of metastases that could be seen.

The pt lives at home with one of his daughters, who is his primary care giver. Pt is widowed. Pt does not smoke, drink alcohol, or use illicit drugs.

Medications

Medication	Classification	Pharmacologic Action	Dose	Nutrition Side Effects
Protonix	antisecretory	proton pump inhibitor	40 mg daily	may decr. abs. of Fe and B12
Amaryl	oral hypoglycemic	sulfonylurea	1 mg	consistent carb diet
Sliding Scale Insulin	hypoglycemic	insulin	variable, 4 units (7/12/13)	consistent carb diet
Ferrous Sulfate	anti-anemic	Iron supplement	325 mg BID	200 mg Vit C per 30 mg Fe will inc. abs.
Norco	antitussive	opioid analgesic	2 tabs PRN	Nausea, loss of appetite
Heparin	anticoagulant	anticoagulant	5000 units q8h	consistent vit K
Tenormin	antihypertensive	cardio-selective beta blocker	50 mg daily	low Na, low Kcal, avoid natural licorice, take 2 hr before or 6 hr after Ca supplements or antacids
Norvasc	antihypertensive	calcium channel blocker	5 mg daily	low Na, low Kcal, avoid natural licorice
Theragran-M	multivitamin		1 tab daily	

Medication	Classification	Pharmacologic Action	Dose	Nutrition Side Effects
Stress-600/ Zinc	multivitamin	Vit B complex, Vit C, Vit E, Zinc	1 tab daily	

Home Medications PTA

Medication	Classification	Pharmacologic Action	Dose	Nutrition Side Effects
Amaryl	oral hypoglycemic	sulfonylurea	2 mg daily	consistent carb diet
Atenolol	antihypertensive	cardio-selective beta blocker	50 mg daily	low Na, low Kcal, avoid natural licorice, take 2 hr before or 6 hr after Ca supplements or antacids
Carafate	anti-ulcer	gastric mucosa protectant	PRN	bland diet
Elavil	antidepressant	unknown	50 mg daily	high fiber may decr. effect
Flomax	antihypertensive	alpha1 adrenergic blocker	0.4 mg daily	low NA, low Kcal
Metformin	anti-hyperglycemia	potentiates effect of insulin, decr. glucose absorption, decr. hepatic glucose production	1000 mg daily	consistent carb diet
Norvasc	antihypertensive	calcium channel blocker	2.5 mg daily	low Na, low Kcal, avoid natural licorice
Protonix	antisecretory	proton pump inhibitor	40 mg BID	may decr. abs. of Fe and B12

Medication	Classification	Pharmacologic Action	Dose	Nutrition Side Effects
Simvastatin	antihyperlipidemic	HMG-CoA Reductase inhibitor	40 mg daily	low fat, low chol.
Valsartan	antihypertensive	angiotensin II receptor antagonist	40 mg daily	caution with K supp or salt subs.

Protonix is a proton pump inhibitor important for this pt due to his history of GERD and a gastric ulcer. The long term use of protonix could be another cause of this pt's recent diagnosis of microcytic anemia due to possibly decreasing the absorption of iron and vitamin B12. SR is already at risk for decreased absorption of iron and vitamin B12 due to the gastric bypass surgery. Iron supplements and Vitamin B12 supplements compete for absorption, so these supplements should be given separately. Vitamin C can help improve iron absorption, so a multivitamin including Vitamin C could be given with the iron supplement. Norco is a cough suppressant that may also cause nausea and decrease appetite. This is important to note because this pt may already be having a decreased appetite and nausea due to the surgery. Tenormin is a beta blocker that the pt takes for treatment of his HTN. This medication may interact with Ca supplements, so it is important to take them separately as well.

Nutrition Diagnosis

PES statements

1. Inadequate protein-energy intake RT physiological causes increasing nutrient needs due to malabsorption AEB estimated energy intake from diet less than recommended levels and nutrient malabsorption due to bariatric surgery.

2. Altered GI function RT altered GI structure AEB Bill Roth II revision/resection to Roux-en-y with partial small bowel resection.
3. Increased nutrient needs RT decreased or compromised function of the intestine AEB loss of subcutaneous fat, and conditions associated with treatment of gastric cancer by bariatric surgery.

For SR, I chose “altered GI function” as my main nutritional problem. I chose this statement because I felt it represented the overall problem that my interventions would address. The other possible problems, inadequate protein-energy intake and increased nutrient needs, are caused by the altered GI function. Therefore, by choosing this as my nutritional problem, I would also be addressing the other problems. In the future, I would have chosen one of the other applicable problems. Even if my interventions are successful, the problem of “altered GI function” cannot be resolved. However, my interventions can resolve increased nutrient needs and inadequate protein-energy intake.

Nutrition Intervention Planning and Implementation

Goals: Prevent weight loss and prevent nutrient deficiencies

1. Advance diet according to meal progression (During this stay, from clear liquids to full liquids)
    a. intake goal of 50-74% of meals
2. Order supplements (Multivitamin, B12, Iron, Calcium, Glucerna)
    a. intake goal of 50-74% of supplement shake

Interventions:

1. Provide meals and snacks

a. Encouraging SR to eat small, frequent meals

b. Encouraging SR to consume high protein, high calorie foods as needed

2. Provide nutrition supplements

a. Follow practice guidelines to provide:

i. Protein supplement drink (Glucerna)

ii. Multivitamin, Calcium, Iron, Vitamin B12 supplements

3. Provide nutrition education to pt and pt's family

a. Importance of supplement use

b. Diet progression plan

c. Education on high calorie, high protein foods and small, frequent meals

Nutrition Monitoring and Evaluation

1. Meal intake reports

a. Monitor meal intakes and set goals for pt to reach calorie and protein recommendations. In the hospital, RNs and PCTs are helpful in keeping track of meal intakes and size of meals. Monitoring supplement drink intake is also important. After discharge, using diet recalls can help assess intake.

2. Weight changes

a. Monitoring changes in weight, especially watching for weight loss. In hospital, RNs using standing scale or bed scale during daily physical assessments. Physical assessment of muscle wasting is another important evaluation. Encourage using the same scale at home for weight changes.

3. Lab values

a. Monitoring Vitamin B12, Iron, Calcium, and Glucose levels will help show effectiveness of diet and supplementation.

4. Signs and Symptoms of common nutrition issues

a. Check for frequency of symptoms of dumping syndrome and hypoglycemia.

Discharge

On July 15th, SR was discharged to Alexian Rehab facility. SR will continue his diet progression and undergo an outpatient PET scan to check for distant mets. As of discharge, SR did not want to have chemotherapy. SR stated his wife had a difficult time with chemotherapy and he does not want to go through it. Pt's daughters stated they will continue to discuss the possibility of chemotherapy with him.

Medical Diagnosis and Disease pathopathysiology

SR's final cancer diagnosis was a pT4a N1 Mx gastric intestinal type adenocarcinoma at the anastamosis site of his previous gastric surgery. This diagnosis means the gastric mass was a stage 4 primary tumor. It is an intestinal type adenocarcinoma, which means that it has a glandular structure. Intestinal type gastric cancer is usually associated with gastritis. The cancer also metastasized to one regional lymph node, but no distant metastases were noted or could be evaluated at present.

To remove the adenocarcinoma, surgeons revised the previous Bill Roth II gastric bypass into a Roux-en-Y gastric bypass. In a Bill Roth II, the proximal end of the jejunum is attached to the distal end of the stomach. For the revision to a Roux-en-Y, a small pouch was created by the anastamosis of the jejunum to the upper part of the stomach. A portion of the small bowel was removed during the reattachment of the jejunum to the stomach.

The pathophysiology of the cancer could be related to multiple factors. Gastritis has been considered a risk factor for gastric cancer. RS was diagnosed with viral gastroenteritis during a prior hospitalization in which the gastric mass was visualized during an EGD. A past distal gastrectomy for benign peptic ulcer disease is another risk factor associated with SR's diagnosis.

Flow Chart Attached.

Nutritional Implications

Gastric bypass surgery, and specifically a Roux-en-Y surgery, has many nutritional implications. The main concern for SR is the prevention of weight loss caused by challenges associated with a smaller stomach. Due to the surgery, which is mostly used to assist with weight loss, SR's stomach is smaller, and he is not able to consume large amounts of food. Since SR had this surgery for cancer treatment and not weight loss, it is especially important to prevent weight loss and muscle wasting. It will be difficult for SR to consume enough calories and protein without a supplement drink.

Dumping syndrome is a main concern due to changes in gastric emptying. When a high osmolar load enters the small bowel too quickly at too fast a rate, fluid is drawn into the small bowel to lessen the osmolarity. Common symptoms of dumping syndrome include cramping, abdominal pain, diarrhea, dizziness, gas, sweating, shakiness, and tachycardia. These symptoms can occur as quickly as ten minutes after eating, or a long as 3 hours after eating. Eating small, frequent meals and consuming beverages at least 30 minutes before and after eating can decrease the risk of dumping syndrome. Avoiding certain foods that are high in simple, easy to absorb carbohydrates,

fried, greasy, and fatty foods can also help decrease the risk of dumping syndrome in gastric bypass patients.

Other important nutritional implications of gastric bypass include malabsorption, anemia. Iron, Vitamin B12, and Calcium are commonly malabsorbed nutrients. Supplements of these nutrients are recommended to help ensure adequate intake and absorption. These nutrients are all absorbed in the small intestine. SInce gastric surgery alters and removes part of the small bowel, absorption of these nutrients is severely affected. Vitamin D, thiamin, and copper may also not be absorbed as well. Providing a multivitamin supplement can ensure patients receive adequate levels of nutrients in their limited diet.

Hypoglycemia is another common nutritional implication of a Roux-en-Y procedure. The surgery creates a shorter transit time for nutrients, which causes significant alterations in gut hormone responses. In a recent study by Khoo et al, it was found that pt's who recently had a Roux-en-Y procedure may be more reliant on gluconeogenesis with fewer gluconeogenic substrates than pt's with a normal GI structure and function. The study showed that plasma levels of pyruvate, lactate, and alanine were decreased in roux-en-y pts when compared to pts with a normal GI structures. When fewer gluconeogenic substrates are available, blood glucose levels can drop too low without a method of replenishing them (Khoo, 2013). SR's history of DM and high blood sugars could counteract this risk of hypoglycemia. However, it is important to check blood glucose levels more often to ensure hypoglycemia is not a problem.

If SR decides to proceed with chemotherapy as an outpatient, there would be further nutritional implications from the cancer treatment. Chemotherapy can significantly decrease appetite, alter tastes, as well as affect absorption and motility of the stomach. Since a nutritional goal for SR is to maintain his weight, these nutritional issues would need to be addressed. At the point of discharge, SR and his family were still deciding if they would proceed with chemotherapy.

Current Practice Guidelines

Current practice guidelines for gastric bypass patients includes encouraging protein supplement drinks, multivitamin, Calcium supplement, Iron supplement, Vitamin B12 supplement, small frequent meals following a diet progression. The importance of vitamin and mineral supplements are discussed above. A protein-based supplement liquid or drink is important due to increased protein needs for healing and a decreased ability to take in large volumes of food. This supplement may be needed long term, depending on the patient's needs. Current practice recommendations from bariatric surgeons at St. Alexius is to provide Ensure HP or Carnation Instant Breakfast since these supplements have less fiber than regular Ensure or Glucerna.

The diet progression recommended post-surgery includes starting with a clear liquid diet and progressively increasing textures until a general diet is reached. For a laparoscopic procedure, the progression can usually advance at a quicker rate than an open procedure due to the less invasive nature of the surgery. The rate of progression based on the Academy of Nutrition and Dietetics is as follows.

1. Day 1 after surgery consists of 30 ml meals of clear liquids each hour or so as tolerated. Sugar-free, non-carbonated, low-fat liquids are recommended to prevent dumping syndrome.
2. Days 2 and 3 post surgery can progress to full liquids. High sugar, high fat, and carbonated foods should still be avoided. The volume of liquids may be increased to 60 ml per hour as tolerated. High protein foods should be added to the diet.
3. 2 weeks after surgery can increase the volume per meal to about 1/4 cup. Fluids, especially a high-protein drink, should be sipped throughout the day.
4. 3 and 4 weeks post-surgery can progress to a pureed diet. The foods should be pureed to grade 1 baby food consistency. Protein foods should be consumed first to ensure adequate protein intake. 6 cups of fluids should be consumed over the course of the day.
5. 5 weeks post-surgery can advance to to a soft diet. These foods include soft proteins such as fish, tender meats and poultry, cottage cheese, eggs, and tofu. Raw vegetables and soft breads should still be avoided.
6. Patients should always eat slowly and drink liquids between meals. High fat, high sugar foods should also be avoided to prevent dumping syndrome. Vitamin and mineral supplements should be continued. Protein supplement drinks may also be needed to ensure adequate protein intake.

Bibliography

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* All patient information was gathered from medical chart, Meditech program, or reports from St. Alexius Medical Center Staff.