

KNH 411 Case Study Presentation

Case Study #3: Malnutrition

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1. Outline the metabolic changes that occur during starvation that could result in weight loss.

A. Hormones, acute-phase proteins, the immune system, and altered cellular metabolism direct the physiological changes that characterize metabolic stress. Stress and injury can activate the hormones that direct a “flight or fight” response, including glucagon, cortisol, epinephrine, and norepinephrine. They act to mobilize nutrient stores to meet the immediate energy demand. Increased levels of glucagon serve to increase glucose production from amino acids (gluconeogenesis). Cortisol increases both gluconeogenesis and free fatty acid mobilization and decreases overall protein synthesis with an increased catabolism of skeletal muscle. Epinephrine and norepinephrine increase energy availability by stimulating glycogenolysis and increasing the release of fatty acids. Release of either glucagon or cortisol can result in hyperglycemia during the stress response. The increased rate of gluconeogenesis creates reliance on protein as a source of glucose. The need for the amino acids alanine and glutamine is increased and since alanine is the primary substrate required for gluconeogenesis, there is an increased catabolism of skeletal muscle to make alanine available to the liver. In injury and stress, the synthesis rate of glutamine, a non-essential amino acid, may be unable to accommodate to the increased requirements. Overall, the changes in metabolism that occur during starvation include: an overall decrease in energy

needs, 20-25 kcal/kg/d decrease in metabolic rate, greater than 90% of kcal come from fat storage, energy from protein is less than 10% for gluconeogenesis, and hormone adaptation preserves protein stores (Nelms, Sucher, Lacey, & Roth, 2011, pp. 684-685).

2. Identify current definitions of malnutrition in the United States using the current ICD codes.

A. Malnutrition is defined by the *International Dietetics and Nutrition Terminology* as, “Inadequate intake of protein and/or energy over prolonged periods of time resulting in loss of fat stores and/or muscle wasting including starvation-related malnutrition, chronic disease-related malnutrition, and acute disease or injury related malnutrition.” Malnutrition is diagnosed through the codes of the *Clinical Modification of the International Classification of Diseases* (ICD-CM). The 2014 ICD-10-CM diagnosis codes of malnutrition include (these codes will replace the ICD-9-CM codes beginning October 1, 2014):

- i. E40 Kwashiorkor
- ii. E41 Nutritional Marasmus
- iii. E42 Marasmic kwashiorkor
- iv. E43 Unspecified severe protein-calorie malnutrition
- v. E44 Protein-calorie malnutrition of moderate and mild degree
- vi. E45 Retarded development following protein-calorie malnutrition
- vii. E46 Unspecified protein-calorie malnutrition

Malnutrition includes codes E40-E46 and is categorized as type 1 or type 2. Type 1 excludes intestinal malabsorption and sequelae of protein-calorie malnutrition, and

type 2 excludes nutritional anemias and starvation. (2014 ICD-10-CM, n.d.; Marcason, 2012)

3. Current definitions of malnutrition use biochemical markers as a component of the diagnosis criteria. Explain the effect of inflammation on visceral proteins and how that may impact the clinician's ability to diagnose malnutrition. What laboratory values will confirm the presence of inflammation?

A. Visceral protein assessment indirectly measures the non-skeletal protein stores that make up the organs, structural components, erythrocytes, granulocytes, lymphocytes, and other proteins found in the blood. A change in serum protein levels should be consistent with changes in visceral protein status; however, the synthesis rate of these transport proteins can be affected by factors other than protein intake or protein requirements. In general, transport protein synthesis is inhibited when the acute-phase protein synthesis rate is increased in response to inflammation, stress, or trauma. In the acute setting, where most patients are affected by these conditions, using transport proteins to measure protein status becomes difficult. Therefore, positive acute-phase proteins are often used as markers of the stress response. These include fibronectin, C-reactive protein (CRP), ceruloplasmin, and serum amyloid A. An acute-phase protein is defined as one whose plasma concentration increases (positive acute-phase proteins) or decreases (negative acute-phase proteins) by at least 25% during inflammatory disorders. Cytokines and other communication molecules within the immune system regulate the release of these proteins. Cytokines include interleukins-IL-1 and IL-6, leukotrienes, tumor necrosis factor, and interferons. IL-6 directly affects

protein metabolism by decreasing acute-phase protein such as albumin and prealbumin and increasing other acute-phase proteins such as CRP. CRP is a common indicator for inflammation and stress that has also been correlated with visceral protein markers. Increasing levels of CRP indicates acute inflammation, which is consistent with lower visceral protein makers. Cytokine production is induced by injury or stress, which can result in loss of appetite, fever, inflammation, and metabolic abnormalities such as hyperglycemia and catabolism (Nelms, Sucher, Lacey, & Roth, 2011, pp. 54, 685-686).

4. What does the AND evidence analysis indicate regarding the correlation of albumin/pre-albumin with visceral protein status and risk of malnutrition during periods of prolonged protein-energy restriction?
 - A. The Academy's Evidence Analysis Library analyzed reduction and/or change in serum albumin and prealbumin with weight loss in prolonged protein energy restriction anorexia nervosa, non-malabsorptive gastric partitioning bariatric surgery, calorie restricted diets, starvations, low-calorie diets, and nitrogen balance. The analysis indicated that these acute-phase proteins do not consistently or predictably change with weight loss, calorie restriction, or nitrogen balance. They appear to better reflect severity of the inflammatory response rather than poor nutritional status. These laboratory tests are probable indicators of inflammation, but do not indicate malnutrition and do not respond to feeding interventions in the setting of active inflammatory response (White, 2012).
5. Read the article: Jensen et al. Adult starvation and disease-related malnutrition: A proposal for etiology-based diagnosis in the clinical practice setting from the

International Consensus Guideline Committee. *Clinical Nutrition* 29 (2010):151-153.

Explain the differences between malnutrition associated with chronic disease and malnutrition associated with acute illness and inflammation.

- A. Chronic disease-related malnutrition is when the degree of inflammation is mild to moderate and is chronic. Examples of this syndrome include organ failure, pancreatic cancer, rheumatoid arthritis, or sarcopenic obesity. Acute disease or injury-related malnutrition is when inflammation is acute and of severe degree. Examples of this syndrome include major infection, burns, trauma, or closed head injury (Jensen, 2010).
6. Mr. Campbell was ordered a mechanical soft diet when he was admitted to the hospital. Describe the modifications for this diet order.
- A. A mechanical soft diet is designed for individuals who have difficulty chewing or are unable to eat hard foods. Foods are mechanically altered by whipping, blending, grinding, chopping, or mashing, to allow the food to be swallowed safely. This diet is designed to prevent individuals from tiring, allowing them to eat more and obtain the nutrients they need to heal. Very hard or large chunks of food should be avoided. The National Dysphagia Diet Guidelines describe a mechanical soft diet on a three level system, based on the varied needs of an individual. A level 1 mechanical soft diet consists of “pudding-like” foods that should be easily moved with the tongue. This diet consists of pureed, consistent, and unified foods with smooth and uniformed textures. Foods provided to an individual on this diet should not need to be chewed. A level 2 mechanical soft diet consist of moist, soft-textured foods that can easily be chewed and

swallowed. Meats and vegetables should be ground or finely cut to be less than ¼ inch in size. All pureed foods from level 1 are also okay to eat. Foods included on a level 3 mechanical soft diet are those that are nearly normal, excluding very hard, sticky, or crunchy foods. Foods should not be overly dry and should still be moist and bite sized (Dixon, 2012).

7. What is Ensure Plus? Determine additional options for Mr. Campbell that would be appropriate for a high-calorie, high protein beverage supplement.
 - A. Ensure Plus is a ready-to-drink, oral nutritional supplement for people with, or at risk of developing, disease-related malnutrition. Each 8 fluid ounce bottle contains 350 kcal, 13 grams of protein, 50 grams of carbohydrates, and 11 grams of fat. Additional ready-to-drink nutritional supplement options for Mr. Campbell would include: Boost Plus or Carnation Instant Breakfast Plus. Boost Plus contains 360 kcal, 14 grams of protein, 45 grams of carbohydrates, and 14 grams of fat per 8 fluid ounce bottle. Carnation Instant Breakfast Plus contains 375 kcal, 13.1 grams of protein, 44.1 grams of carbohydrates, and 16.2 grams of fat in each 8 fluid ounce serving (Nestle Nutrition, n.d.).
8. Assess Mr. Campbell's height and weight. Calculate his BMI and % usual body weight.
 - A. Mr. Campbell's height is 6'3" and he has a current weight of 156 pounds. With his diagnosis of cancer 5 years ago, and even after the completion of radiation therapy, Mr. Campbell indicates his weight held steady at 220 pounds. Over the course of the past 1-2 years, he has lost over 60 pounds (Nahikian-Nelms & Roth, 2013, pp. 24-28).
 - i. $BMI = \text{weight (kg)} / [\text{height (m)}]^2$

- Weight= 156 lbs./2.2kg= 70.9 kg
- Height= 75 inches x .0254m= 1.9m
- BMI= 70.9 kg/1.9m²= **19.6 kg/m²**

a. BMI of 18.5-24.9 indicates a normal weight

ii. %UBW= (current weight/UBW) x 100

- %UBW= (156 lbs./220 lbs.) x 100= **70.9%**
- % Weight change= (220 lbs.-156 lbs./220 lbs.) x 100= 29.1%

iii. IBW for Men= 106 lbs. for 5 foot + 6 lbs. per inch over 5 foot

- 106 lbs. + 6 lbs. (15 inches)= 196 lbs.

(Nelms, Sucher, Lacey, & Roth, 2011, pp. 48)

9. After reading the physician's history and physical, identify any signs or symptoms that support the diagnosis of malnutrition.

A. Identification of two or more of the follow characteristics is recommended for the diagnosis of adult malnutrition: insufficient energy intake, weight loss, loss of muscle mass, loss of subcutaneous fat, localized or generalized fluid accumulation that may sometimes mask weight loss, and diminished functional status as measured by hand grip strength (White, 2012). In Mr. Campbell's history and physical, it is indicated that he has lost weight, that he feels weak, and that he does not have the energy to do anything. The physical indicates that the patient looks cachetic and appears older than his current age. It is noted that the patient has temporal wasting, reduced neurologic strength, decreased muscle tone with normal range of motion, and loss of lean mass in his quadriceps and gastrocnemius. According to his hematology results, his RBC, hemoglobin, and

hematocrit levels are all below normal, which are indicative of malnutrition

(Sonora Quest Laboratories, 2013; Nahikian-Nelms & Roth, 2013, pp. 24-28).

10. Evaluate Mr. Campbell's initial nursing assessment. What important factors noted in his nutrition assessment may support the diagnosis of malnutrition?

A. In the past 1-2 years, Mr. Campbell has lost over 60 lbs. and is 70.9% of his usual body weight. Mr. Campbell's intake percent of meals is indicated at less than 5%, with sips of liquids. The patient's recommended fluid requirements are 2000-25000 mL/day, however, the patient was only consuming 360 mL without I.V. intervention. The patient's usual intake for the past several months has been insufficient to meet his nutritional requirements (Nahikian-Nelms & Roth, 2013, pp. 24-28).

11. What is a Braden score? Assess Mr. Campbell's score. How does this relate to his nutritional state?

A. A Braden scale is used to score a patient's level of risk for developing pressure ulcers. It measures functional capabilities of the patient that contribute to either higher intensity and duration of pressure or lower tissue tolerance for pressure. The Braden Scale measures six risk factors: sensory pressure, moisture, activity, mobility, nutrition, and friction/shear, which are scored on a scale of 1-4 (1 for low level of functioning and 4 for the highest level or no impairment). Total scores range from 6-23 (friction/shear is scored with values of 1-3, only). The subscales measure functional capabilities of the patient that contribute to either higher intensity and duration of pressure, or lower tissue tolerance for pressure. Lower levels of functioning indicate higher levels of risk for pressure ulcer

development. Mr. Campbell's Braden score was measured at a 17, indicating that he is at low risk for developing a pressure ulcer. A Braden score assesses a patient's usual food intake pattern, ranking it from very poor to excellent.

Inadequate caloric intake can result in weight loss and a decrease in subcutaneous tissue, allowing bony prominences to compress and restrict circulation, increasing the incidence of a pressure ulcer (U.S. National Library of Medicine, 2013).

12. Identify any signs or symptoms from the physician's history and physical and from the nursing assessment that are consistent with dehydration.

A. In Mr. Campbell's assessment, he expresses that he feels lethargic and it is indicated that his skin displayed tenting during a skin turgor test. His nutrition assessment states that Mr. Campbell is only meeting 360 mL of his 2000-2500 mL fluid requirements. Mr. Campbell's lab results are also consistent with dehydration, with elevated sodium and chloride levels, and low potassium and calcium levels. Elevated sodium levels can indicate increased fluid loss and elevated chloride levels can indicate metabolic acidosis, which can result from severe dehydration. Low potassium levels are commonly caused by antibiotics, diarrhea or vomiting, chronic kidney disease, diuretic medicines, eating disorders, low magnesium level, and sweating. Low calcium levels may be a result of hypothyroidism, kidney failure, liver disease, magnesium deficiency, disorders that affect absorption of nutrients from your intestines, osteomalacia, pancreatitis, and/or vitamin D deficiency. Mr. Campbell also has increased BUN and creatinine serum levels. BUN or blood urea nitrogen forms when proteins break down. Higher-than-normal levels can indicate dehydration. Creatinine is formed

when creatine, an important part of muscle, is broken down. High creatinine serum levels can indicate dehydration. His urinalysis indicated slightly elevated specific gravity, also indicative of dehydration (U.S. National Library of Medicine, 2011).

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

A. Protein requirements are affected by metabolic stress, trauma, and disease. If patients are receiving adequate kcal, protein requirements can be met by providing 1.0-1.5 g protein/kg/day (Nelms, Sucher, Lacey, & Roth, 2011, pp. 61). However, A.S.P.E.N. and ADA recommend that protein requirements for individuals who are critically ill to be estimated at 2 g protein/kg/ideal body weight and energy needs be estimated at 22-25 kcal/kg of actual body weight (Nelms, Sucher, Lacey, & Roth, 2011, pp. 688). To calculate Mr. Campbell's energy requirements, I took his current weight of 70.9 kg and multiplied that by 22 and 25 kcal/kg, to establish his estimated minimum and maximum requirements. I then added 250 kcal to these estimations in order to promote a ½ pound weight gain for Mr. Campbell per week to help him reach his ideal body weight of 196 pounds. Because his albumin and prealbumin levels were extremely low (1.8 g/dL and 9 mg/dL, respectively), Mr. Campbell's protein needs were estimated to be 1.5-2.0 g protein/kg of his current body weight.

i. Estimated Energy Requirements= 1,850- 2,050 kcal

- 22 kcal/kg x 70.9 kg= 1,560 kcal
- 25 kcal/kg x 70.9 kg= 1,773 kcal

- Adding 250 kcal/day for a ½ lb. weight gain/week
- ii. REE for males: $10 W \text{ (kg)} + 6.25 H \text{ (cm)} - 5 \text{ Age} + 5$
 - $10(70.9) + 6.25 (190) - 5(68) + 5 = 1,562 \text{ kcal} \times 1.1 = 1,718 \text{ kcal}$
 - Activity factor 1.1= confined to bed

iii. Estimate Protein Requirements= 106-142 g/day

- $1.5 \text{ g} \times 70.9 \text{ kg} = 106.4 \text{ grams protein/day}$
- $2.0 \text{ g} \times 70.9 \text{ kg} = 141.8 \text{ grams protein/day}$

14. Determine Mr. Campbell's fluid requirements. Compare this with the information on the intake/output report.

A. Fluid Requirements= 1,850- 2,050 mL

- i. $1 \text{ mL/kcal} \times 1,850 \text{ kcal} = 1,850 \text{ mL}$
- ii. $1 \text{ mL/kcal} \times 2,050 \text{ kcal} = 2,050 \text{ mL}$
 - (Nelms, Sucher, Lacey, & Roth, 2011, pp. 123)

According to Mr. Campbell's intake/ouptake report, he is consuming 360 mL orally while receiving 2,160 mL per day through an I.V. His total output was 1,444 mL, resulting in a net I/O of +1,076 mL (Nahikian-Nelms & Roth, 2013, pp. 26).

15. From the nutrition history, assess Mr. Campbell's usual dietary intake. How does this compare to the requirements that you calculated for him?

- A. After calculating Mr. Campbell's estimated dietary intake through the USDA's SuperTracker, if he consumed the amounts listed in the chart below, he received a total of 582 calories, 30 grams of protein, 72 grams of carbohydrates, and 30% of his total calories came from fat. Mr. Campbell consumed over 1,000 less calories

then his recommended amount of 1,850-2,050 kcal/day and he needed to consume 103 grams more of protein to meet his minimum estimated requirements (USDA, 2013).

Breakfast	Calories
½ large egg fried	37
4 oz. regular coffee	1
½ slice of 100% whole wheat bread	34
10 am	
½ can Ensure Plus	178
Lunch	
½ cup chicken noodle soup	31
¼ cup 2% milk	30
Dinner	
1 thin slice beef pot roast	49
¼ cup mashed potatoes	43
Snack	
½ can Ensure Plus	178
Total	582 kcal 30 g PRO

16. Identify the pertinent nutrition problems and the corresponding nutrition diagnoses and write at least two PES statements.

A. Malnutrition (NI-5.2) (Academy of Nutrition and Dietetics, 2013, pp. 190-191)

i. Malnutrition related to chronic disease (squamous cell carcinoma of tongue) as evidenced by patient's unintentional weight loss of 29.1% of his usual body weight in the past 1-2 years, patient's insufficient energy intake over the past several months, patient's lack of appetite, patient's decreased muscle tone and loss of lean mass in his quadriceps and gastrocnemius, and patient's prealbumin level of 9 mg/dL.

B. Unintended Weight Loss (NC-3.2) (Academy of Nutrition and Dietetics, 2013, pp. 252-253)

- i. Unintended weight loss related to client's inability to consume sufficient energy as evidenced by a 29.1% weight change within the last two years, client's decreased appetite over the last several months, patient's decreased muscle tone and loss of lean mass in his quadriceps and gastrocnemius, and patient's partial glossectomy 5 years ago.

C. Inadequate Energy Intake (NI-1.2) (Academy of Nutrition and Dietetics, 2013, pp. 154-155)

- i. Inadequate energy intake related to patient's decreased ability to consume sufficient energy as evidenced by patient's 29.1% weight change within the last two years, client's decreased appetite over the last several months, patient's failure to consume estimated needs from diet, and patient's partial glossectomy 5 years ago.

17. Determine the appropriate intervention for each nutrition diagnosis.

A. Since Mr. Campbell is unable to meet his nutritional needs through the oral route, enteral nutrition (EN) is needed. A.S.P.E.N. 2009 guidelines document Grade B evidence that enteral nutrition should be started early within the first 24-48 hours following admission (Nelms, Sucher, Lacey, & Roth, 2011, pp. 688). The goals of therapy are to achieve and maintain healthy lean body mass and body fat. Patients with cancer need nutrition with high protein to help maintain and rebuild loss muscle (Hamilton & Boyce, 2013). Since Mr. Campbell has been unable to meet his nutrition needs orally for the past several months, enteral nutrition is necessary to help him meet his needs, regain lean body mass, and promote healthy weight gain to reach his ideal body weight. This will be accomplished by

providing Mr. Campbell with 1,500 mL of Isosource HN, a 1.2 kcal/mL, high protein formula. Mr. Campbell will be started at 32 cc/hr and increased by 10 cc every 3 hours until his goal rate of 63 cc/hour is reached. After tolerance is established by monitoring his I/O and GI tolerance, Mr. Campbell will be progressed to bolus feedings. He will first receive 250 cc, 6 times/day, and once he is able to tolerate this, he will be provided with 375 cc, 4 times/day. Over a 24-hour period, Mr. Campbell will receive 1,800 kcal, 80 grams of protein, 240 grams of carbohydrates, and 58.5 grams of fat from this formula. Since Mr. Campbell has been consuming small quantities of food orally, I would also order Mr. Campbell to a level 1 mechanical soft diet, to encourage him to meet the rest of his needs through oral intake. I would recommend for him to drink lots of fluids and continue to consume a nutritional beverage supplement.

18. Based on the criteria established in Jensen et. al.'s article as well as the consensus statement from AND and ASPEN, what type of malnutrition is Mr. Campbell experiencing? Provide the specific criteria that support your diagnosis.

A. Mr. Campbell is experiencing chronic-disease related malnutrition. This is supported by the client's energy intake of <75% of estimated energy requirement for more than one month, his 29.1% weight change in the past 1-2 years, and his decreased muscle tone and loss of lean mass in his quadriceps and gastrocnemius. Mr. Campbell's lab results indicate inflammation with an elevated C-reactive protein level of 2.4 mg/dL and low albumin (1.8 g/dL) and pre-albumin (9 mg/dL) levels (White, 2012).

19. Identify the steps you would take to monitor Mr. Campbell's nutritional status while he is hospitalized. How would this differ if you were providing follow-up care through his physician's office?

A. While Mr. Campbell is hospitalized, it is important to monitor his weight, evaluate his albumin and prealbumin laboratory levels, and evaluate his oral versus enteral calorie intake, to decide if bolus feedings can be lowered to increase oral intake. When providing follow-up care through his physician's office, the main focus would be to monitor his weight and evaluate his calorie intake to ensure he is meeting his nutritional needs, gaining appropriate weight, and rebuilding muscle.

20. Write your ADIME note for this initial nutrition assessment for Mr. Campbell.

A.

Assessment:

- i. Patient diagnosed with squamous cell carcinoma of tongue five years ago.
Patient previously treated with radiation therapy- no treatment x 3 years.
Partial glossectomy five years ago.
- ii. 68 yo male DX: Patient admitted to acute care for possible dehydration, weight loss, generalized weakness, and malnutrition. Patient ordered to receive 0.9% sodium chloride with potassium chloride 20 mEq 125 mL/hr and vancomycin 1 g in dextrose 200 mL IVPB.
- iii. Height: 6'3" Weight: 156# BMI: 19.6 kg/m²

- iv. Physical assessment: decreased neurologic strength; decreased muscle tone with normal ROM; loss of lean mass noted quadriceps and gastrocnemius; skin turgor= TENT; Braden score=17
- v. Lab values: Sodium 150 mEq/L; Potassium 3.4 mEq/L; Chloride 118 mEq/L; BUN 36 mg/dL; Creatinine serum 1.27 mg/dL; Calcium 8.4 mg/dL; Total Protein 5.8 g/dL; Albumin 1.8 g/dL; Prealbumin 9 mg/dL; CRP 2.4 mg/dL; Cholesterol 92 mg/dL; RBC $2.4 \times 10^6/\text{mm}^3$; Hemoglobin 8.1 g/dL; Hematocrit 24.1%; Mean Cell Volume $100.6 \mu\text{m}^3$; Mean cell Hgb 33.6 pg; RBC distribution 18%; Lymphocyte 11%; Specific gravity 1.033; Protein 100 mg/dL; Ketones +; Pro chk +; Bact +
- vi. EER: 1,850- 2,050 kcal EPR: 106-142 grams Fluid Requirements: 1,850- 2,050 mL

Diagnosis:

- i. Malnutrition related to chronic disease (squamous cell carcinoma of tongue) as evidenced by patient's unintentional weight loss of 29.1% of his usual body weight in the past 1-2 years, patient's insufficient energy intake over the past several months, patient's lack of appetite, patient's decreased muscle tone and loss of lean mass in his quadriceps and gastrocnemius, and patient's prealbumin level of 9 mg/dL.
- ii. Unintended weight loss related to client's inability to consume sufficient energy as evidenced by a 29.1% weight change within the last two years, client's decreased appetite over the last several months, patient's

decreased muscle tone and loss of lean mass in his quadriceps and gastrocnemius, and patient's partial glossectomy 5 years ago.

- iii. Inadequate energy intake related to patient's decreased ability to consume sufficient energy as evidenced by patient's 29.1% weight change within the last two years, client's decreased appetite over the last several months, patient's failure to consume estimated needs from diet, and patient's partial glossectomy 5 years ago.

Intervention:

- i. Begin patient on enteral nutrition, 1500 cc of Isosource HN/day with a goal rate of 63 cc/hour. Patient will be started at 32 cc/hr with an increase of 10 cc every 3 hours until a goal rate of 63 cc/hour is reached. After tolerance is established, Mr. Campbell will be progressed to bolus feedings. He will first receive 250 cc, 6 times per day. Once this is tolerated, he will be progressed to 375 cc, four times/day. This will provide him with 1,800 kcal, 80 grams of protein, 240 grams of carbohydrates, and 58.5 grams of fat. In order to meet the rest of his recommended needs, Mr. Campbell will be ordered a level 1 mechanical soft diet and encouraged to consume Ensure Plus, Boost Plus or Carnation Instant Breakfast Plus. Overall, the goal is to normalize his protein markers and increase his weight to reach his ideal body weight of 196 lbs.

Monitoring/Evaluation:

- i. Mr. Campbell's renal function will be monitored to ensure his kidney's can handle the amount of protein he is being recommended. This will

be evaluated through his urine output, BUN, and creatinine serum levels. His protein status will be evaluated through his albumin and prealbumin laboratory results. His weight needs to be monitored to evaluate his progress towards his ideal body weight of 196 pounds and as well as his fluid status to prevent further dehydration.

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