

**Georgia State University  
Coordinated Program  
Evaluation of Written Assignments – Case Study**

Name Melissa Vigdor Date 3/10/14 Topic Acute Care Case Study  
 Evaluator Jessica Todd

	Comments
<b>Preparation (10 points)</b> Appearance is neat; assignment is legible; scheduled deadline met	10
<b>Introduction (5 points)</b> Provided a brief introduction to the topic	5
<b>Content (45 points)</b> Organized the information into appropriate sub-topics. Summarized the relevant research; identified the relationship and understanding between the existing knowledge, strengths and limitations of the current knowledge; comprehensive coverage of subject. The literature review was comprehensive and up-to-date. All components of the Nutrition Care Process were included. Applicable meds and labs were not only listed but discussed.	42 See notes throughout
<b>Conclusion (5 points)</b> Student discussed any changes based on the literature that should have been made.	5
<b>Style (25 points)</b> Assignment was organized; correct spelling and word usage; appropriate sentence structure; proper use of punctuation; first person is not used	Excellent writing! Minor mistakes 23
<b>Bibliography: (10 points)</b> All were references were listed and complete information was provided. The reference citation format was JAMA.	10
<b>Overall</b>  <b>Total Points _____/100 pts</b>	95

Melissa Vigdor  
Grady Memorial Hospital  
Acute Care Case Study  
February 19, 2014

### Introduction

Grady Memorial Hospital is a large, public hospital in Atlanta, Georgia. It primarily serves a low-income population and many of its patients are admitted with a host of co-morbidities. Patient social and economic issues, lack of insurance and poor lifestyle choices further complicate an already complex situation. From a nutrition perspective, the management of health conditions while in the hospital is most important, and often priority must be given to one of the many conditions a patient may have. This is the case with a patient infected with HIV/AIDS.

### Case Presentation

JJ is a 27 year-old male with HIV/AIDS, AIDS-related dementia, bipolar disorder, hypertension and a history of polysubstance abuse. He was admitted to the hospital on January 18th, 2014 for aggressive behavior and confusion, which was suspected to be connected to Wernicke's Encephalopathy (WE). *What is WE?*

JJ was diagnosed with HIV in April 2012 while incarcerated. Since this time, he has been in and out of the hospital for confusion, behavior disturbance and psychosis. Up until his current admission, he was non-compliant with his AIDS medications. His CD4 count has steadily declined to 12 cells/mm<sup>3</sup>. This is considered category 3 AIDS (CD4 below 200 cells/mm<sup>3</sup>)(1). His blood pressure was normal during his hospital stay suggesting his hypertension was well-controlled.

Prior to admission, he was living with his mother, but she is no longer comfortable caring for him due to his psychotic and delusional behavior. JJ is also unable to care for himself and will likely be discharged to a long-term care facility.

*is CD4 count the only descriptive for category 3 AIDS?*

### Nutrition Initial Assessment

#### Anthropometric Information:

Age/Gender: 27 years old, Male

Height: 172.7 cm (5'8")

Weight: 45.36 kg (100lb)

Body Mass Index (BMI): 15.21kg/m<sup>2</sup> (*underweight*)

% Weight change: Patient was not able to report due to confusion

~~Regular~~ Body Weight (RBW): 53.7 kg (118lb) based on BMI 18

*Recommended*

*this is still underweight, go to 18.5 @ least*

**Nutrition-Related Physical Findings:**

JJ was visibly wasted, but alert, somewhat confused and extremely outspoken. He had no complaints of diarrhea, constipation, or vomiting, but vocalized his dissatisfaction with the amount of food he was receiving in the hospital. Moreover, he had multiple dietary preferences. He had no complaints of typical AIDS nutrition-related symptoms such as decreased appetite, mouth sores, taste changes or bloating. JJ also indicated he was not receiving his medications at the appropriate times. This was an issue because several of his medications needed to be taken with food - specifically, Atazanavir, which was less effective without a high-fat meal. He reported feeling nauseous when his medications were administered, which may be attributed to non-compliance prior to admission, or the side effects of the medications. *OR not taking w/adequate meals*

**Significant Medications**

Medication Name	Medication Purpose	Food/Drug Interaction	Nutrition-Related Side Effects
Abacavir	HIV	N/A	Nausea, vomiting
Atazanavir	HIV	Take with food (high-fat)	N/A
Depakote	Bipolar disorder	Avoid alcohol	N/A
Diflucan	Candidiasis	N/A	Nausea, vomiting, taste changes
Ritonavir	HIV	Take with food	Diarrhea, nausea, vomiting
Thiamine	Wernicke's Encephalopathy	N/A	N/A
Metoprolol	Hypertension	Take with food; 2 hours before or after multivitamin	Shortness of breath, fatigue
Zyprexa	Antipsychotic	Avoid alcohol	N/A
Multivitamin	Treat vitamin deficiencies associated with illness	N/A	N/A

**Significant Labs**

Labs	Reference Ranges	Day 1 1/18/13	Day 13 1/30/13	Day 18 2/4/14	Day 21 2/7/14
Albumin	3.5 - 5.0 g/dL	3.4 g/dL	3.4 g/dL	N/A	3.5 g/dL
Glucose	70 - 125 mg/dL	86 mg/dL	85 mg/dL	N/A	69 mg/dL
Osmolality (OSMO)	275 - 300 mOsm/L	265 mOsm/L	273 mOsm/L	N/A	273 mOsm/L
Red Blood Cells (RBC)	4.40 - 5.90 M/mcL	3.20 M/mcL	3.08 M/mcL	N/A	3.38 M/mcL
Hemoglobin (Hgb)	13.5 - 17.5 g/dL	8.3 g/dL	8.5 g/dL	N/A	9.6 g/dL
Hematocrit (Hct)	40.0 - 50.0%	26.8%	27.3%	N/A	30.3%
Iron	65 - 150 mcg/dL	N/A	N/A	31 mcg/dL	N/A



### Laboratory Values

JJ's laboratory values indicated low levels of RBCs, Hgb and Hct implying anemia, which could be connected to malnutrition or malabsorption. Red blood cell production requires adequate intake of nutrients, as well as sufficient amounts of iron, vitamin B-12 and folic acid. Anemia in HIV/AIDS can also be related to hormonal alterations, infections and medications(1). An iron study reviewed JJ had low iron and a supplement was recommended in addition to the multivitamin he was already taking. ✓

On day 1, JJ's OSMO was low, 265mOsm/L. Low OSMO can be associated with decreased levels of sodium, but JJ's values were within normal limits (WNL). Another possible reason is that JJ could have been drinking too much fluid. During his hospital stay his OSMO trended upwards and was just below normal, which eliminated the need for concern.

or overhydration with IVs

The patient's albumin levels started out just below normal, but increased during his hospital stay and fell WNL. Albumin levels can be influenced by chronic inflammation, which is experienced in HIV/AIDS(1). All other laboratory values were WNL.

What about the low blood sugar on 2/7/14

**Nutrition Diagnosis:** Malnutrition NI-5.2 related to increased needs secondary to HIV and low BMI

**Nutrition Intervention:** General/healthful diet ND-1.1 and Commercial beverage ND 3.1.1

Since JJ was not having issues with suppressed appetite, hypertension or diet toleration and his BMI was below the underweight mark, he was placed on a general diet with double portions and Boost Breeze to supplement energy intake. Due to the patient's state of confusion, education outside of medication interaction was not an option during the initial assessment.

Another dietitian estimated energy needs (EEN) for JJ at 30 -35kcal/kg of RBW for category 3 AIDS patients. RBW was based on a BMI of 18 since JJ was severely underweight. Total calories were calculated to be 1,620 - 1,890kcal/day. Protein needs were based on 1.2 - 1.5g/kg of RBW, which equated to 64 - 81g/day.

### Plan:

1. Change diet to general diet with double portions and Boost Breeze. Honor patient diet preferences to optimize energy intake.
2. Monitor patient's by mouth (PO) intake.
3. Monitor electrolytes closely and replete as needed.

Did you agree?  
What does the research  
say?

### *Monitoring and Evaluation:*

**Nutrition Goal:** PO intake to meet 75 – 100% of nutrition needs within 24-72hours

**Monitor:** PO intake, appetite, weight, labs and mental status (to assess whether nutrition education is an option).

**Evaluate:** Whether the established goal was met.

### **Literature Review**

#### *HIV/AIDS*

Human immunodeficiency virus (HIV) is chronic disease that targets the immune system and attacks a person's CD4 cells. Eventually the immune system becomes so impaired that the virus progresses to acquired immunodeficiency syndrome (AIDS), which causes increased risk for infection and can be fatal if left untreated. Since nutritional status is associated with the immune system, nutrition therapy interventions can positively influence HIV/AIDS and work towards reestablishing adequate nutritional status(1).

There are numerous underlying issues that patients with HIV/AIDS may present with that can negatively influence their nutritional status such as financial/food insecurity, substance abuse, and additional co-morbidities. Each of these factors is important to consider when providing medical nutrition therapy (MNT) to the patient. Patients that are admitted with poor nutritional status, should be screened for malnutrition and AIDS-related wasting. These are serious problems that are difficult to reverse and are associated with higher death rates. It is important for the healthcare team to catch these conditions soon after diagnosis to slow disease progression(2).

Patients infected with HIV/AIDS have increased resting energy expenditure (REE), which means they require a higher energy intake than a healthy person. In patients with HIV, REE is approximately 10% higher than in a healthy person. This percent is even higher in patients with HIV wasting(3), which is defined as "any unintentional weight loss, characterized by loss of muscle mass in men and a loss of both muscle and fat mass in women, which is predictive of disease progression and mortality"(4). Alternatively, the Centers for Disease Control and Prevention (CDC) defines AIDS-related wasting syndrome as "as a 10% weight loss from baseline in a 6-month period accompanied by diarrhea or chronic weakness and fever for more than 30 days without a known cause"(2). Research has also shown REE to be higher than 10% in HIV-infected patients with additional opportunistic infections or symptomatic AIDS. Evidence does not link nutrition intervention with improved mortality in HIV wasted patients. However, some data shows body weight and lean body mass increase with proper nutritional support(3).

Research conducted by Baum et al. agrees that nutrient intake levels recommended for the general population are not sufficient for HIV infected patients. HIV-infected adults require an additional 10 - 15% more energy each day and approximately 50 - 100% more protein(5). Due to increased metabolic demands, the recommended calorie and protein needs for individuals with AIDS are 35 to 40 kcal/kg and 1.5 - 2.0 g/kg of <sup>Good</sup> protein based on the patient's current body weight(6). The Georgia Dietetic Association Diet Manual suggests increasing calories to up to 45kcal/kg of current body weight for symptomatic AIDS patients(7).

This calorie and protein level was effective in a population of hospitalized AIDS patients with opportunistic diseases and weight loss of greater than 10% in the previous six months or BMIs under 18.5 kg/m<sup>2</sup>. Participants were fed six meals per day and three snacks based on the recommended calorie and protein guidelines for individuals with AIDS. To optimize intake, meals were planned with each person's food preferences in mind. In addition to meals, a high protein, high calorie supplement was administered throughout the day. Weight, BMI, triceps skinfold (TSF), arm circumference (AC), albumin and lymphocytes all significantly improved after 19 days of intervention. These findings illustrate the positive impact of dietary intervention in malnourished AIDS patients(6). ✓

Maximizing food intake is the principle focus for nutrition intervention. It is important to collaborate with the patient on their individual preferences, as this will encourage energy intake. High calorie and high protein foods should be promoted(4).

Alternatively, the American Dietetic Association (ADA) found limited evidence supporting increasing protein levels in HIV/AIDS patients. Protein may help maintain body cell mass, but research does not exist on specific protein needs, turnover rate, and increasing protein intake(2). *Yet we have specific recs we use based on symptomatic/asymptomatic; is this controversial?*

Malnutrition, defined as "the cellular imbalance between supply of nutrients and energy and the body's demand for them to ensure growth, maintenance, and specific functions," is a substantial concern for infected patients since it is associated with hastening the progression of HIV to AIDS. This is because malnutrition further weakens the immune system(5). Malnutrition is often seen in this population since nausea, diarrhea, vomiting, lesions in esophagus and mouth, decreased appetite, and malabsorption are common symptoms associated with HIV/AIDS(8). Research shows that optimal nutrition permits the body to resist infection and disease, and maintain a healthy energy level. Nausea and vomiting can also be caused by medications and may lead to malnutrition. Additionally, patients with AIDS related dementia, may have difficulty to preparing meals and take care of themselves(5). ✓

Malnutrition in HIV/AIDS patients can either be primary or secondary. Primary malnutrition is associated with unhealthy eating habits or inadequate intake of food and important nutrients. This could be due to food being unavailable or inaccessible. Secondary malnutrition is the result of an infection or disease that leads to increased energy expenditure or malabsorption(9). ✓



HIV wasting is less common today due to the advent of antiretroviral therapy medications (ARV), which are designed to lessen viral load. However, it is still prevalent among individuals facing food insecurity, with low-income levels, abusing drugs or with high viral loads. It is important to perform a thorough nutrition assessment two to three times a year when working with HIV/AIDS patients. This way, wasting or wasting-related risks can be detected. One assessment technique is called the ABCD method: anthropometric, biochemical, clinical and dietary. BMI should be calculated using weight in kilograms divided by height in meters squared. A patient with a BMI under 20 is a concern and should be evaluated for loss of lean body mass, which indicates wasting. Labs should be taken and special attention must be paid to hemoglobin and blood glucose levels. Research has shown low levels of these lab values may have a negative affect on immune function and contribute to wasting(4). Inflammatory markers such as C-reactive protein, and nutritional status markers such as albumin and transferrin should also be assessed. However, HIV/AIDS is a chronic inflammatory state, that may impact these labs(1). During the assessment it is also important to evaluate the patient's diet and discuss drug-nutrient interactions(4). Monitoring a patient's weight and BMI are critical in identifying AIDS-related wasting(2). ✓

Positive outcomes have been associated with nutrition education and counseling in this population. A meta-analysis of 45 clinical trials revealed wasted patients that received nutrition counseling gained weight, improved body composition and increased grip strength, which is an indicator of nutrition status. For maximum benefit, counseling should focus on maintaining body weight, eating healthy foods, drug-nutrient interactions, managing AIDS-related symptoms and barriers the patient may have(4).

Nutritional supplements may be effective for HIV patients facing food insecurity. Supplements may improve nutritional status, and decrease weight loss. Maintaining healthy levels of micronutrients is also important for HIV/AIDS patients. Low levels of micronutrients can cause fatigue, anemia, decreased immunity, and increased mortality. According to The World Health Organization (WHO), individuals with HIV/AIDS should receive supplements based on the Recommended Dietary Allowances (RDA). Previous studies have shown multivitamins are effective at improving hemoglobin concentration, reducing anemia risk and increasing CD4 counts, thus contributing to the delay of disease progression. Research has not shown significant better outcomes related to multivitamin supplementation higher than the RDA (10).

The medications HIV/AIDS patients take can also influence nutritional status. ARV therapy often allows patients to improve quality of life and live longer. Patients on ARVs may even reverse malnutrition, improve viral load and decrease loss of muscle mass. Unfortunately, ARVs are not without their own complications. It is important to monitor patients for lipodystrophy, weakened bones, dyslipidemia, and insulin resistance as these conditions may lead to cardiovascular disease and diabetes(9). Additionally, vitamin and mineral levels should be closely monitored. ARVs have been shown to increase the breakdown of vitamin D in the body. As a result, the National

You need  
reference  
in these  
studies

Endocrine Society recommends patients on ARVs take two to three times the recommended amount to avoid vitamin D deficiency(10). *interesting*

#### *AIDS and JUVEN*

JUVEN is a nutrition supplement designed to support immune function and help build lean body mass in people with HIV/AIDS. Composed of CaHMB (HMB), arginine (Arg) and glutamine (Gln), each component has a unique function. Arginine is an amino acid that helps build muscle and develop immune cells, HMB helps muscle cells remain strong, and glutamine is an amino acid that builds muscle and helps immune function(11). Interestingly, while AIDS-related wasting is associated with loss of both lean body mass and fat mass, often, fat mass is preserved while lean mass is lost. While it is not certain, it is thought that wasting is due to the increased rate of muscle breakdown that exceeds the rate of protein synthesis in AIDS patients. Arginine, glutamine and HMB have been shown to decrease the rate of muscle catabolism. An 8-week study revealed participants in the intervention group that took HMB/Arg/Gln gained 2.6kg more than the control group. Additionally the intervention group increased lean tissue by 2.6kg while the control group lost .7kg of lean tissue. The HMB/Arg/Gln group also decreased their viral loads while at the same time positively influencing CD4 levels illustrating overall improved immune function(12). ✓

#### *AIDS and Hypertension*

A 2011 study conducted by Leite and Sampaio evaluated the relationship between dietary calcium, dairy food intake and metabolic parameters in a population with HIV/AIDS on ARVs. The results showed individuals with a lower consumption of dietary calcium were two times as likely to suffer from hypertension. This suggests a diet higher in calcium may serve as a safeguard for hypertension in HIV/AIDS patients. However, it must be noted that a 24-hour recall was used to measure the participants' calcium intake, which creates an environment for over or under-reporting consumption. Moreover, future studies are needed to illustrate a cause and effect relationship between dietary calcium and hypertension(13). ✓

*I wonder if you'd find the same with potassium*

#### *HIV-Associated Dementia*

Currently, there is no effective treatment for HIV-Associated Dementia (HAD). However, ARVs help with prevention of HAD and may also improve the symptoms associated with it(14). ✓

#### *Wernicke's Encephalopathy*

WE is a neurological disorder that often presents itself in conjunction with alcoholism or AIDS. The condition is directly linked to thiamine deficiency and can be fully reversible if a patient receives proper treatment through thiamine supplementation. Magnesium deficiency can also cause WE since it is needed for the conversion of thiamine to its biologically active form. Thiamine deficiency has multiple causes, some of the most common are: alcohol abuse, increased metabolic requirements (AIDS), and



decreased intake of thiamine-containing foods. Additionally, decreased thiamine absorption is often seen in malnourished individuals. This is because thiamine absorption occurs via active transport. This necessitates adequate energy intake, which a malnourished person lacks(15). ✓

### *Strengths and Limitations of the Literature*

A large body of general research on HIV/AIDS exists that establishes the need for adequate nutrition in this population. However, many of the targeted intervention studies were conducted in developing countries, which cannot be generalized to the United States. As medications continue to increase longevity, additional studies are warranted. This will result in a deeper understanding of how nutrition influences this population. Likewise, it is important to note that even though studies have been conducted that prove the effectiveness of the components in JUVEN for AIDS-related wasting none of these studies are recent. As treatment advances and new therapies are introduced, it is important to keep the evidence current in order to ensure it continues to apply to the population.

GOLD

### Evaluation of Intervention

JJ fits the criteria for AIDS-related wasting due to his 15.2kg/m<sup>2</sup> BMI. Evidence supports increasing energy and protein intake to support weight gain and increase BMI. Therefore, providing double portions in combination with Breeze Boost supplements was appropriate to help JJ gain weight and increase his BMI. Evidence also supports collaborating with the patient on individual preferences to encourage adequate intake. This was accomplished through catering to JJ's many food requests.

JJ was placed on a multivitamin since studies have shown them to be effective in reducing anemia, improving hemoglobin concentration and increasing CD4 counts. He was also ordered thiamine to treat WE. On 2/4/14 labs showed JJ's iron level was low (31 mcg/dL), and providing an iron supplement was suggested to help raise levels and combat anemia. However, the patient was discharged before the supplement was ordered.

Nutrition follow-ups with JJ uncovered a strong desire to gain weight. His appetite remained strong and he was consuming all of the food and supplements provided, but his weight was not increasing very much. JUVEN was introduced to the patient to help slow muscle breakdown and improve immune function. JJ increased his weight from 102.5lb to 106.5lb over a three-day timespan and as a result, his BMI increased to 16.2kg/m<sup>2</sup>. This weight increase may not be directly associated with JUVEN, but it seemed to give the patient hope that he would be able to continue to gain weight.

4lbs = fluid?

### Conclusion

According to the literature, the nutrition care plan that was implemented for JJ was evidenced-based. However, further measures beyond BMI calculation should have

been taken to evaluate JJ for loss of lean body mass and AIDS-related wasting. Also, calorie and protein calculations were based on RBW for asymptomatic HIV/AIDS patients, but JJ was symptomatic, so levels should have been calculated using 45kcal/kg according to the literature. However, if JJ was eating his entire double portion tray and drinking his supplements, he would have far exceeded either calorie requirement. ✓

Labs are always monitored while caring for a patient, but HIV/AIDS patients on ARVs are at risk for elevated blood glucose levels and triglycerides. They are also at risk for decreased vitamin D levels. These labs should have been added to the nutrition note in the monitor section. ✓

Additionally, the intervention fell short because nutrition education was not effectively provided. This is an important intervention for patients with HIV/AIDS and JJ was in need of instruction on the importance of taking his medicine, food-drug interactions, eating a healthy diet and getting enough calories/protein. He also could have benefitted from food safety information since his immune system was compromised. Although several attempts at formal education were made, the patient's mental status did not allow him to retain the information. Hopefully, his behavior will stabilize enabling him to learn about his condition and ways to improve his quality of life while living with the disease. ✓

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