**Shawna Jenkins**

**November 13, 2014**

**Case Study #3**

**DIE 3213-81395**

**Case 10 – Irritable Bowel Syndrome (IBS)**

**Questions:**

1. **IBS is considered to be a functional disorder. What does this mean? How does this relate to Mrs. Clarke’s history of having a colonoscopy and her physician’s order for a hydrogen breath test and measurements of anti-tTG? (3 points)**
* A functional disorder can be defined as disorders where the body’s normal activities are impaired, all organs are normal, but still shows signs of something wrong. In terms of IBS, movement through the intestines, sensitivity of intestinal nerves, and brain-gut interaction all are impaired. The Rome III criteria categorize the GI disorder’s boundaries and define symptoms for each tier.
* The patient presents a negative colonoscopy for active disease, but has exemplified multiple IBS symptoms lasting many years. The physician’s order for a hydrogen breath test and measurement of anti-tTG were due to further ruling out of causes of persistent diarrhea and constipation and other related IBS symptoms. Hydrogen breath tests are being used to investigate GI disorders by the production of hydrogen from anaerobic bacteria in the colon. Anti-tTG is a screening test for celiac disease. Symptoms of CD are similar to that of IBS and the test can be utilized to rule out CD.
* IFFGD. IBS and Non-GI Functional Disorders. International Foundation for Functional Gastrointestinal Disorders. Available at: www.aboutibs.org/site/what-is-ibs/other-disorders/non-gi-functional-disorders. Accessed on November 9, 2014.
1. **What are the ACG and the Rome III criteria? Using the information from Mrs. Clarke’s history and physical, determine how Dr. Cryan made her diagnosis of IBS-D. (2 point)**
* The Rome III criteria were designed to define boundaries for irritable bowel syndrome. To meet Rome III criteria, patient must display two or more of following symptoms: difficulty during at least ¼ of defecations, hard stools in at least ¼ of defecations, feeling of incomplete elimination for at least ¼ of defecations, feeling of blockage for at least ¼ of defecations, fewer than three defecations per week. Patient must also experience symptoms for at least six months and have experienced discomfort for at least three days a month, for the last three months.
* According to Mrs. Clarke’s history and physical, incidents of DI stress have been occurring persistently for many years. She is experiencing both bouts of diarrhea and constipation. Patient was referred by family physician. Physician found negative stool cultures eliminating the indication of the presence of disease-causing bacteria for prolonged diarrhea occurrence. Use of Lomotil prn may be reason for constipation, as it is prescribed to decrease number of bowel movements.
	+ Rome Foundation. Rome III Disorders and Criteria. Rome Foundation. Available at: http://www.romecriteria.org/criteria/. Accessed on November 9, 2014.
	+ Drugs and Medications: Lomotil. WedMD. Available at: http://www.webmd.com/drugs/2/drug-6876/lomotil/details/. Accessed on November 9, 2014.

1. **Discuss the primary factors that may be involved in IBS etiology. You must include in your discussion the possible roles of genetics, infection, and serotonin. (3 points)**
* Specific cause of IBS is unknown, but ongoing research is concentrated on the relationship of IBS with genetics, infection and serotonin levels. A mutation of the SCN5A genes has been linked to IBS disorder. Altered immune response due to distorted microbial environment has also been linked to a causal relationship with IBS. Seratonin-modulating drugs are one of the most favorable treatments for IBS. More than 95% of serotonin is found within the GI tract and is directly related to symptoms of IBS due to the effect on sensation sensitivity, muscle contraction and secretory function.
	+ Nelms M, Sucher K, Lacey K et al. Nutrition Therapy and Pathophysiology. Cengage Learning; 2010.
1. **Mrs. Clarke’s physician prescribed two medications for her IBS. What are they and what is the proposed mechanism of each? She discusses the potential use of Lotronex if these medications do not help. What is this medication and what is its mechanism? Identify any potential drug–nutrient interactions for these medications. (3 points)**
* Mrs. Clarke was prescribed 25 mg daily of Elavil and 1 tbsp of Metamucil in 8 oz of liquid twice a day. Elavil is a tricyclic antidepressant and is prescribed to reduce anxiety and reduce pain as a result of IBS. Patient is described as having an anxious appearance and complains of lower abdominal tenderness. Elavil should be taken before bedtime to lessen abdominal pain. Patient listed consumption of alcohol 3-4 times per week, which could alter effectiveness of prescription drug Elavil. Metamucil is a fiber supplement that is prescribed as an efficient laxative treatment. Metamucil can alter bowel movements for people who are suffering from either constipation or diarrhea.
* Lotronex is prescribed following inefficiency of other medications to alleviate IBS. It is usually prescribed to women who have been suffering from severe IBS and symptoms of diarrhea. Lotronex blocks the action of the neurotransmitter serotonin in the intestines and its side effects.
* Drug-nutrient interactions are inevitable if patient does not alter current dietary intake. Intake of carbonated beverages decrease effectiveness and have side effects of weight gain and increased appetite. Metamucil decreases cholesterol and LDL levels and can benefit the patient and her already increased laboratory values of cholesterol (201 mg/dL) and triglycerides (171 mg/dL).
	+ Nelms M, Sucher K, Lacey K et al. Nutrition Therapy and Pathophysiology. Cengage Learning; 2010.
	+ DailyMed. Lotronex (alosetron hydrochloride) Tablet. U.S. National Library of Medicine. Available at: http://dailymed.nlm.nih.gov/dailymed/archives/fdaDrugInfo.cfm?archiveid=4160. Accessed on November 12, 2014.
1. **For each of the following foods, outline the possible effect on IBS symptoms. (2 point)**
* Lactose: Many people experience GI distress due to intolerance of lactose. Lactose intolerance can create similar symptoms to those of IBS and also worsen IBS symptoms.
* Fructose: IBS symptoms are worsened if patient suffers from malabsorption of fructose, which is also known as fruit sugar. Formulations of natural fructose, such as high-fructose corn syrup, are being used for added sweetness in manufactured foods and are causing damage to GI tract.
* Sugar alcohols: Not easily absorbed and digested and are known to produce gas, bloating and cramping. Sugar alcohols, such as Sorbitol, cause more detrimental and uncomfortable side effects for patients with IBS because of SIBO (small intestinal bacterial overgrowth). The sugar alcohols are essentially nourishing the bacteria increasing symptoms of IBS.
* High-fat foods: Major trigger foods that cause IBS symptoms due to gastrocolic reflex and increase of intensity of colon contraction.
	+ IFFGD. What is the Effect of Diet on IBS? International Foundation for Functional Gastrointestinal Disorders. Available at: http://www.aboutibs.org/site/what-is-ibs/intro-to-ibs/diet. Accessed on November 11, 2014.
1. **What is FODMAP? What does the current literature tell us about this intervention? (2 point)**
* FODMAP is an acronym that stands for fermentable oligosaccharides, disaccharides, monosaccharides and polyols. It is a list of indigestible sugars that are found in many foods, and are poorly absorbed by the small intestine and contribute to digestive difficulties.
* FODMAP intervention is implemented to avoid trigger foods via a high/low scale. High FODMAP foods are those to avoid, while low FODMAP foods are more acceptable. Intervention is being employed as a core strategy for IBS control by steady production of beneficial bacteria in gut. It is unique and can be tailored to an individual’s lifestyle and dietary preferences.
	+ IBS Diets FODMAP Dieting Guide. FODMAP Food List. IBS Organization. Available at: http://www.ibsdiets.org/fodmap-diet/fodmap-food-list/. Accessed on November 13, 2014.
1. **Define the terms prebiotic and probiotic. What does the current research indicate regarding their use for treatment of IBS? (2 point)**
* Prebiotic: *oligosaccharide components of the diet that are preferred energy substrates of “friendly” microbes in the GI tract.* They are used to promote growth of beneficial intestinal bacteria.
* Probiotic: *food or concentrates of live organisms that contribute to a healthy microbial environment and suppress potential harmful microbes*. They are used to reestablish the presence of beneficial intestinal gut flora.
* Prebiotics and probiotics are synbiotic dietary supplements and are recommended to improve overall GI health. The precise mechanism of how prebiotics and probiotics aid in reduction of IBS symptoms is undetermined, but have presented favorable results in lessening symptoms.
	+ Mahan LK, Escott-Stump S, Raymond JL et al. Krause's Food & the Nutrition Care Process. Elsevier Health Sciences; 2012.
	+ Eat Right. Prebiotics and Probiotic: The Dynamic Duo. Academy of Nutrition and Dietetics. Available at: http://www.eatright.org/Public/content.aspx?id=6442477443. Accessed on: November 11, 2014.
1. **Assess Mrs. Clarke’s weight and BMI. What is her desirable weight? (3 points)**
* Mrs. Clarke is a 42-year-old female who is 5’5” and weighs 191 pounds. Her BMI is calculated to be 31.8, which is determined to be obese.
	+ BMI= ((191 lb)/ (65in2)) x 703 = 31.8
* Desirable body weight can be determined by the calculation of: IBW= 100 lbs for first 5 ft + 5 lbs for each inch over 5 feet
	+ IBW = 100 lbs + (5 lbs x 5) = 125 lbs
	+ CDC. Adult BMI Calculator. Centers for Disease Control and Prevention. Available at: http://www.cdc.gov/healthyweight/assessing/bmi/adult\_bmi/ html. Accessed on November 12, 2014.
	+ Hamwi Method. Ideal Body Weight Calculator. Available at: http://www.nafwa.org/hamwi.php. Accessed on November 12, 2014.
1. **Identify any abnormal laboratory values measured at this clinic visit and explain their significance for the patient with IBS. (3 points)**

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| **Lab Result** | **Ref. Range** | **6/30 1000** |
| Glucose (mg/dL) | 70-110 | 115 |
| Cholesterol (mg/dL) | 120-199 | 201 |
| Triglycerides (mg/dL) | 35-135 F | 171 |
| HbA1c (%) | 3.9-5.2 | 6.1 |

* Patient’s lab values are relatively normal with the exception of glucose, cholesterol, triglycerides and HbA1c. Some indications of these abnormal laboratory values suggest predisposition to Diabetes, which can contribute to her IBS symptoms. High levels of both cholesterol and triglycerides were recorded, supporting obesity and increase risk of stroke and heart attack. Increased levels of hemoglobin, alpha 1, also known as HbA1c, are a diagnostic of prediabetes. Although Mrs. Clarke is still considered a “non-diabetic” by this type of screening, continued diet and lack of exercise will not aid in prolonged health.
	+ ADA. How to Treat Diabetic Diarrhea? American Diabetes Association. Available at: http://www.diabetes.org. Accessed on November 13, 2014.
1. **List Mrs. Clarke’s other medications and identify the rationale for each prescription. Are there any drug–nutrient interactions you should discuss with Mrs. Clarke? (3 points)**
* Omeprazole 50 mg b.i.d.; prescribed for gastroesphageal reflux disease, similar to Prilosec, best to take 30-60 minutes before meal followed by cool water.
* Levothyroxine 25 mg; prescribed for low thyroid activity, best to take before first meal with glass of water to increase absorption, decreases calcium absorption.
* Vitamin D 600 IU; solution may be mixed with juice or soft food to avoid metallic taste, aids in calcium absorption, can contribute to both constipation and diarrhea, toxicity can occur and offer depression and headaches.
* Calcium 800 mg; prescribed to initiate constipation, suggested to take with a magnesium supplement to balance out diarrhea/constipation, taken to compensate for decrease of calcium absorption due to prescribed Levothyroxine.
* Lomotil prn; prescribed as antidiarrheal, suggested to take with food if GI distress occurs, needs to increase fluid and electrolyte consumption, taken as needed.
* I would recommend to Mrs. Clarke to follow suggestions of times and food intake for drug interactions appropriately, to ease and reduce IBS symptoms. If a diet of low FODMAP was followed, reduction and complete removal of some drugs may be possible.
	+ Pronsky ZM, Sr. JP. Food Medication Interactions. Food Medication Interactions; 2012.
1. **Determine Mrs. Clarke’s energy and protein requirements. Be sure to explain what standards you used to make this estimation. (3 points)**
* EER for Females 19 Years of Age and Older
	+ EER = 354 – 6.91 x age + PA x (9.36 x weight(kg) + 726 x height(m))
	+ PA = physical activity coefficient; 1.12 for low active
	+ EER = 354 – 6.91 x (42) + 1.12 x (9.36 x 86.64 + 726 x 1.65) = 2131 kcal/day
* Protein needs can be determined by using RDA recommendations for adult women, (0.8g/kg DBW)
	+ 0.8g/kg x 86.64kg = 69 g/day
	+ Nelms M, Sucher K, Lacey K et al. Nutrition Therapy and Pathophysiology. Cengage Learning; 2010.
1. **Assess Mrs. Clarke’s recent diet history. How does this compare to her estimated energy and protein needs? Identify foods that may potentially aggravate her IBS symptoms. (3 points)**
* With the use of the SuperTracker tool provided by the USDA, the patient is consuming roughly her recommended amount of calories of 2131 kcal/day and protein requirements of roughly 69 g/day, determined by the EER equation and RDA recommendations. Although patient is meeting caloric needs, food options are not ideal for minimizing IBS symptoms. Her consumption of empty calories and saturated fats are above recommended levels. According to the FODMAP, foods such as legumes, fruits that contain high amounts of fructose, pastas and breads, artificial sweeteners, beer and wine, and yogurt should all be avoided to reduce IBS symptoms, all of which Mrs. Clarke is regularly consuming.
	+ SuperTracker. United States Department of Agriculture. Available at: https://www.supertracker.usda.gov. Accessed November 10, 2014.
1. **Prioritize two nutrition problems and complete the PES statement for each. (5 points)**
* Altered GI function (NC-1.4) related to possible dietary carbohydrate intolerance as evidenced by long history of symptoms closely related to IBS.
* Unintended weight gain (NC-3.4) related to hypothyroidism as evidenced by obesity.
1. **The RD that counsels Mrs. Clarke discusses the use of an elimination diet. How may this be used to treat Mrs. Clarke’s IBS? (2 point)**
* Recommendation of elimination diets is to determine certain foods that may irritate and cause distress to GI tract as well as trigger IBS symptoms. A typical elimination diet is usually comprised of a 4 step, 12-week strict dietary intake:
1. Comprise a list of foods that aggravate and increase symptoms of IBS.
2. Eliminate foods on list, one at a time, for about 12 weeks and note any modification.
3. If no encouraging correction of symptoms is noticed, reintroduce that food and remove the next food on list.
4. Begin your elimination diet with fiber.
* IFFGD. 12-Week Elimination Diet for IBS. International Foundation for Functional Gastrointestinal Disorders. Available at: http://www.aboutibs.org/site/treatment/diet/12-week-elimination-diet. Accessed on November 13, 2014.
1. **The RD discusses the use of the FODMAP assessment to identify potential trigger foods. Describe the use of this approach for Mrs. Clarke. How might a food diary help her determine which foods she should avoid? (2 point)**
* According to Mrs. Clarke’s dietary recall, most nutrition consumed is considered high FODMAP foods. High FODMAP foods are foods to avoid because they have been distinguished to cause and worsen IBS symptoms. Some high FODMAP foods that she is regularly consuming include beans, asparagus, fruits with high fructose contents, dairy products with high lactose contents, carbonated beverages and artificial sweeteners. The addition of a food diary may help the patient become more aware of food choices, lessen symptoms of IBS as well as aid in overall weight loss. Not only will a food diary assist the patient, but also help the Physician or RD in determining future treatment options.
* IFFGD. Symptom Diary. International Foundation for Functional Gastrointestinal Disorders. Available at: http://www.aboutibs.org/site/signs-symtpoms/symtpom-diary. Accessed on November 13, 2014.
1. **Should the RD recommend a probiotic supplement? If so, what standards might the RD use to make this recommendation? (2 point)**
* The recommendation of addition of probiotic supplements would be inexpensive and beneficial to patient. Probiotic supplements have been shown to alleviate some common symptoms experienced with IBS such as abdominal pain, gas, and constipation. L. acidophilus is one of the most common and most agreeable probiotics and is recommended to help treat diarrhea and GI distress.
	+ UMM. Irritable Bowel Syndrome. University of Maryland Medical Center. Available at: <http://umm.edu/health/medical/altmed/condition/irritable-bowel-syndrome>. Accessed on November 13, 2014.
1. **Mrs. Clarke is interested in trying other types of treatment for IBS including acupuncture, herbal supplements, and hypnotherapy. What would you tell her about the use of each of these in IBS? What is the role of the RD in discussing complementary and alternative therapies? (2 point)**
* Complementary (in conjunction with) or alternative (instead of) treatments such as acupuncture, herbal therapy and hypnotherapy can be used if medical therapies are unsuccessful alone. Use of acupuncture is thought to redirect energy and promote positive flow to ensure a good state of health. Herbal therapy will sometimes be used in combination with acupuncture for patients with sever cases of IBS. Herbal therapy is individualized and is based on symptom patterns. Herbal therapies are not completely safe and drug-nutrient interactions should be discussed. Hypnotherapy is also a complementary treatment in reducing IBS symptoms. Although it has been shown to be an effective method, it can be costly for patient as well as time consuming.
* The RD should discuss all types of therapies for patient’s overall well being, but should not promote one over the other as to influence the patient.
	+ IFFGD. Complementary and Alternative Treatments. International Foundation for Functional Gastrointestinal Disorders. Available at: http://www.aboutibs.org/site/treatment/complementary-or-alternative-treatments/. Accessed on November 13, 2014.
1. **Write an ADIME note for your initial nutrition assessment with your plans for education and follow-up. (5 points)**

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| **Assessment** | * 42 y/o female
* Ht. 5’5”, Wt. 191#
* BMI: 31.8
* Labs: glucose (115 mg/dL), cholesterol (201 mg/dL), triglycerides (171 mg/dL), HbA1c (6.1%)
* EER: ~2100 kcal/day EPR: ~69 g/day
* Patient meets Rome III criteria for IBS-D. Negative stool cultures, colonoscopy negative for active disease. Complaints of abdominal discomfort and consistent diarrhea/constipation episodes.
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| **Diagnosis** | * Altered GI function (NC-1.4) related to possible dietary carbohydrate intolerance as evidenced by long history of symptoms closely related to IBS.
* Unintended weight gain (NC-3.4) related to hypothyroidism as evidenced by obesity.
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| **Intervention** | 1. Recommend modification of diet to incorporate increased consumption of low FODMAP foods, while reducing consumption of high FODMAP foods to decrease symptoms of IBS.
2. Suggest logging of dietary intake into a food diary.
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| **Monitoring/Evaluation** | 1. Monitor IBS symptoms, re-evaluate dietary recommendations if needed.
2. Monitor patient’s weight and BMI, re-evaluate dietary recommendations if needed.
3. Monitor patient’s original abnormal laboratory values.
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2. Rome Foundation. Rome III Disorders and Criteria. Rome Foundation. Available at: http://www.romecriteria.org/criteria/. Accessed on November 9, 2014.
3. Drugs and Medications: Lomotil. WedMD. Available at: http://www.webmd.com/drugs/2/drug-6876/lomotil/details/. Accessed on November 9, 2014.
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18. IFFGD. Complementary and Alternative Treatments. International Foundation for Functional Gastrointestinal Disorders. Available at: http://www.aboutibs.org/site/treatment/complementary-or-alternative-treatments/. Accessed on November 13, 2014.