

## Celiac Disease Case Study

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- 1. The small biopsy results state, “flat mucosa with villus atrophy and hyperplastic crypts—inflammatory infiltrate in lamina propria.” What do these results tell you about the change in anatomy of the small intestine?**

For a person with celiac disease the small biopsy will show villi of a reduced height and a flattened appearance, while the crypts remain at a greater height (Nelms, Sucher, Lacey, & Roth, 2011). This will in turn decrease the absorptive surface area in the small intestine.

- 2. What is the etiology of celiac disease? Is anything in Mrs. Gaine’s history typical of patients with celiac disease? Explain.**

Celiac Disease is an autoimmune disease that is brought on by genetic, environmental, and autoimmune elements. This is consistent with Mrs. Gaine’s account of family members having “funny stomachs.” Also, celiac disease may be brought on or initiated by things like pregnancy, childbirth and emotional stress (U.S. Department of Health and Human Services, 2012), all of which Mrs. Gaine has experienced in the last six months.

- 3. How is celiac disease related to the damage to the small intestine that the endoscopy and biopsy results indicate?**

In response to consuming foods that contain gluten the immune system of people with celiac disease starts to destroy villi, which can be seen with a biopsy of a sample of the small intestine (The American Society for Gastrointestinal Endoscopy, 2012).

- 4. What are AGA and EMA antibodies? Explain the connection between the presence of antibodies and the etiology of celiac disease.**

AGA=anti-Gliadin antibody      EMA=Anti-endomysial antibody

A positive test for AGA will reveal a gliadin allergy and a positive EMA test will indicate the presence of autoantibodies. These autoantibodies aim to destroy body tissues like the mucosal cells of the small intestine. These are consistent with the etiology of celiac disease because these autoantibodies cause the damage to the villi in the small intestine (The Environmental Illness Resource, 2012).

**5. What is a 72-hour fecal fat test? What are the normal results for this test?**

The patient ingests 100 grams of fat each day, collecting stool for three days. Normal results are 5-7 grams of fat in stool per 24 hours (Nelms, Sucher, Lacey, & Roth, 2011).

**6. Mrs. Gaines laboratory report shows that her fecal fat was 11.5g fat/24 hours. What does this mean?**

This indicates fat malabsorption is present. A diagnosis of steatorrhea can be made.

**7. Why was the patient placed on a 100-gram fat diet when her diet history indicates that her symptoms are much worse with fried foods?**

To determine if patient is malabsorbing fat through a 72-hour fecal fat test.

**8. Gluten restriction is the major component of the medical nutrition therapy for celiac disease. What is gluten? Where is it found?**

Gluten is a form of protein mainly found in wheat, rye, barley, malt, and sometimes in oats due to contamination. It is also found in various non-food sources as well. It is important that someone with celiac disease know how to identify gluten in the label of products (The American Society for Gastrointestinal Endoscopy, 2012).

**9. Can patients on a gluten-free diet tolerate oats?**

As long as the oats are pure and uncontaminated up to most people with celiac disease can tolerate ½ cup of dried oats. Oats can become contaminated by their processing on same equipment with products with gluten or by addition as customary of some companies (Celiac Disease Foundation, 2012).

**10. What sources other than foods might introduce gluten to the patient?**

Gluten can also be found in medications, stamps, envelopes, vitamin/mineral supplements, and additives in things such as lipstick (Celiac Disease Foundation, 2012).

**11. Can patients with celiac disease also be lactose intolerant?**

Patients can be temporarily lactose intolerant. Due to the damage of the villi, brush border enzymes, like lactase, are decreased. Once the patient consumes a gluten free diet and their villi repair, the lactose intolerance may go away.

**12. Calculate the patient's percent UBW and BMI, and explain the nutritional risk associated with each value.**

$\%UBW = (92/112) * 100 = 82\% \rightarrow$  which indicates moderate weight loss

$BMI = (92 * 703) / (63^2) = 16.3 \rightarrow$  underweight

This patient is at risk for osteoporosis and anemia due to the perceived lack of consumption of nutrients, like calcium and iron. Also, at risk for fertility problems due to amenorrhea (loss of period) and delayed wound healing (Washington State Department of Social and Health Services, 2011).

**13. Calculate this patient's total energy and protein needs using the Harris-Benedict equation or Mifflin-St. Jeor equation.**

$BEE = 655 + (9.6 * 41.8\text{kg}) + (1.8 * 160\text{cm}) - (4.7 * 36) = 1175 * 1.3 = 1528$  kcals

Protein:  $41.8\text{kg} * 1.5 = 63$  grams/day

**14. Evaluate Mrs. Gaines 24-hr recall for adequacy.**

Mrs. Gaines 24-hour recall is not adequate in calories and other necessary nutrients, such as protein.

**15. From the information gathered within the intake domain, list possible nutrition problems using the diagnostic term.**

- Inadequate energy intake (NI-1.4)
- Inadequate oral intake (NI-2.1)
- Inadequate protein intake (NI-5.7.1)
- Malnutrition (NI-5.2)

**16. Evaluate Mrs. Gaines laboratory measures for nutritional significance. Identify all laboratory values that support a nutrition problem.**

LOW albumin (2.9 g/dL), prealbumin (13 mg/dL), and total protein (5.5g/dL) which indicated depleted protein stores.

LOW RBC (9.5 g/dL) and ferritin (12mg/dL) indicate anemia.

**17. Are the abnormalities identified in question 16 related to the consequences of celiac disease? Explain.**

Celiac disease can cause malabsorption, which can result in depleted visceral protein stores and anemia due to the damage to the villi and inability to completely absorb nutrients.

**18. Are any symptoms from Mrs. Gaine's physical examination consistent with her laboratory values? Explain.**

Anemia can cause pale skin, lack of energy or feeling tired often. This can be related to her statement about not being able to get off the couch. Depleted protein and calories can also

results in muscle wasting, which can make one feel weak as well (Nelms, Sucher, Lacey, & Roth, 2011).

**19. Evaluate Mrs. Gaines other anthropometric measurements. Using the available data, calculate her arm muscle area.**

$AMA = [18 - (3.14 * .75)^2] / (4 * 3.14) = 19.48 - 6.5 (\text{for correction}) = 12.99 \rightarrow$  Mrs. Gaines is below average when it comes to arm muscle area (Perry, 2007).

**20. From the information gathered within the clinical domain, list possible nutrition problems using the diagnostic term.**

- Underweight (NC-3.1)
- Unintended weight loss (NC-3.2)
- Altered GI function (NC-1.4)

**21. Using the VA nutrition screening form, what is this patient's nutrition status level?**

Mrs. Gaine has an overall nutritional status of three.

**22. Select two high-priority nutrition problems and complete the PES statement for each.**

- Food and nutrition related knowledge deficit (NB-1.1) related to new diagnosis of celiac disease and no prior education for a gluten free diet as evidenced by positive EMA and AGA and patients recent diagnosis of celiac disease.
- Altered GI function (NC-1.4) related to damage of villi in small intestine as evidenced by small intestine biopsy, low albumin, prealbumin, total protein, and ferritin levels.

**23. For each of the PES statements that you have written, establish an ideal goal (based on the signs and symptoms) and an appropriate intervention (based on the etiology).**

- Skill development of identifying gluten on product labels
- Adherence to gluten free diet.
- Use of Ensure Plus, a commercial beverage, to provide extra calories and protein during weight gain and healing.
- Making sure that the patient has social support from friends and family during lifestyle change.

**24. What type of diet would you initially begin when you consider the potential intestinal damage that Mrs. Gaines has?**

I would start on a low fat diet and increase as tolerated. I would also start on a lactose free diet as the patient may be temporarily lactose intolerant and increase as tolerated. I would also recommend a gluten free, low fat and lactose free diet.

**25. Mrs. Gaines nutritional status is so compromised that she might benefit from high – calorie, high-protein supplementation. What would you recommend?**

I would recommend a supplementation of Ensure Plus to confirm that the patient is receiving enough calories and protein.

**26. Would glutamine supplementation help Mrs. Gaines during the healing process? What form of glutamine supplementation would you recommend?**

I would recommend a gluten free L-glutamine supplement. This will help her body fuel her enterocytes, since she was below average, and keep up her energy levels while healing.

**27. What result can Mrs. Gaines expect from restricting all foods with gluten? Will she have to follow this diet for very long?**

Within a few weeks of restricting all foods with gluten Mrs. Gaines should experience relief from most of her symptoms. However, repair to her villi may take multiple months. She will have to follow a gluten free diet for the rest of her life so that the symptoms and damage do not return (Celiac Disease Foundation, 2012).

**28. Evaluate the following excerpt from Mrs. Gaine’s food diary. Identify the foods that might not be tolerated on a gluten/gliadin-free diet. For each food identified, provide an appropriate substitute.**

<b>Foods</b>	<b>Appropriate Substitute</b>
Cornflakes	Read label OR sub with rice flakes
Bologna Slices	Read label OR sub with fresh meat like turkey
Lean Cuisine—Ginger Garlic Stir Fry with Chicken	Read label-especially for soy sauce Sub for frozen meal with no sauce and patient can add own sauce that is gluten free
Skim Milk	Soy if not tolerated
Cheddar cheese spread	Read label OR sub with sliced block cheese
Green Bean Casserole (mushroom soup, onions, green beans)	Read label (especially for soup) OR sautéed green beans with mushrooms
Coffee	Tolerated
Rice Crackers	Tolerated
Fruit Cocktail	Tolerated
Sugar	Tolerated
Pudding	Gluten free pudding
V8 Juice	Tolerated
Banana	Tolerated
Cola	Tolerated—limit

(Nelms, Sucher, Lacey, & Roth, 2011)

\*\*\*Very important to check all food labels to make sure no gluten\*\*\*

## References

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