Celiac Disease & Gluten Intolerance

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Disclosures

• I have no financial disclosures or conflicts of interest
The “Rules”

- The slides are to spark discussion points.
- If I am not explaining something well, please stop me.
- There will be time for questions (index cards).
Learning Objectives

• Understand how healthy carbohydrate digestion works
• Define gluten, celiac disease, gluten intolerance and how they all relate
• Discuss daily living with celiac disease and gluten intolerance
Basics of Digestion
The Basics: Is it all just plumbing and pipes?

How Digestion Works
Healthy Digestion

*It’s all just plumbing, right?*

**Digestion**: act or process of converting food into chemical substances that can be absorbed and assimilated

**Motility**: the spontaneous peristaltic movements that aid in digestion, moving food through the digestive tract
Requirements for digestion and motility

- **Nerves** to respond to **hormones** and **move** things through the digestive tract
- Smooth **muscle** to squeeze and grind
- Healthy cells to line the organs and secrete **digestive juice**
- Ability to absorb nutrients

Many things can go wrong
Small Intestine

- Responsible for nutrient absorption
- Moves undigested particles to the colon
- Different areas absorb vitamins and minerals
- Cannot live without the small intestine
Carbohydrate digestion

- Requires enzymes in the small intestine to chemically break down into simple sugars
- Enzymes sit on the surface of the small intestine. These are called the “villi”
- When carbohydrates are not properly digested, diarrhea, bloating, and gas can result
WHAT IS GLUTEN?
DEFINE CELIAC DISEASE
Gluten

- A protein found in wheat, barley, and rye
- Helps bread dough rise and helps food stick together
- Added to foods to enhance protein content as well as to improve texture
- Not just in bread
Celiac Disease

- An autoimmune disease
  - Immune system attacks native organs
- Body reacts to gluten, attacking the small intestine
- 1 in 133 Americans
- 3 million Americans have celiac
- Often takes 4 years of symptoms prior to diagnosis being made
- 97% of people with celiac in the United States do not know they have the health problem
Investigators do not know every detail of how the immune system wreaks havoc with the intestinal lining of celiac patients, but they have identified a number of likely processes (below). Colored arrows indicate events that might be blocked by interventions now being investigated [see table on opposite page].
What are the common symptoms of celiac disease?

- Disrupted bowel behavior
  - Diarrhea or constipation
- Abdominal pain
- Anemia
- Fatigue
- Weight loss
### Nongastrointestinal nonmalignant symptoms of celiac disease

- Infertility
- Rheumatic disorders
  - Vitamin D and calcium deficiency
    - Osteomalacia
    - Osteoporosis
- Neurologic disorders
  - Depression - 10.6 percent
  - Epilepsy - 3.5 percent
  - Migraine headaches - 3.2 percent
  - Anxiety - 2.6 percent
  - Suicidal tendency - 2.1 percent
  - Carpal tunnel syndrome - 1.8 percent
  - Myopathy - 1.5 percent

Many of the symptoms may indicate other health issues as well

- Irritable bowel syndrome
- Crohn’s Disease
- Ulcerative colitis
- Gallbladder issues
- Liver or pancreas problems
- Thyroid disease
DIAGNOSIS OF CELIAC DISEASE
Celiac Disease - Diagnosis

Testing needs to be performed on regular diet

- Lab Tests
- Samples (biopsies) of the small intestine by a procedure called an endoscopy
Celiac Disease- Lab Tests

- Tissue transglutaminase (TTG)
  - Most accurate lab test
- Endomysium (EMA) and Gliadin Antibodies
  - Older Tests; less accurate
Celiac Disease-Endoscopy and Biopsy

- Able to assess the damage to the intestines
- Confirms the diagnosis
- Doctor needs to take multiple samples (6) in order to properly make or rule out the diagnosis
  - Important question to ask

Arch Pathol Lab Med. 2012;136:735–745;
“Villous Atrophy”
Taking Enough Biopsies is Important

**Figure 1.** Histogram of number of specimens of small-bowel biopsies among individuals not known to have celiac disease undergoing upper GI endoscopy with duodenal biopsy (n = 132,352).

**Figure 2.** Number of specimens submitted and the probability of the diagnosis of celiac disease (Marsh IIIA/B/C, P for trend < .0001).

Gross findings (OR 3.67; 95% CI, 2.86-4.72) than for those with normal gross findings (OR 1.91; 95% CI, 1.38-2.63). Among physicians who submitted duodenal biopsy
What if I am already on a gluten free diet?

- Consider a “gluten challenge” for testing
- 3 grams of gluten a day for 4 weeks (one piece of bread)

- If you cannot stop the diet there is a genetic test. “HLA typing”
Human Leukocyte Antigen

All patients with celiac disease have HLA-DQ2 or HLA-DQ8

A negative test means celiac disease is near impossible

If the test is positive it does not necessarily mean anything

25-30% of people have HLA-DQ2 or HLA-DQ8
I tested positive, now what?

RISKS OF CELIAC DISEASE
Treatment

- Gluten free diet
- No medications are available currently
- Monitoring of the diet and blood work with your doctor
- Monitoring for nutrition issues
Health risks of celiac disease

- Coping with the symptoms
- Coping the diet
- Nutritional deficiencies
  - Vitamin D
  - Iron
  - Vitamin B12
  - Folic Acid
- Osteoporosis (bone density issues)
I tested negative, now what?

GLUTEN INTOLERANCE
What is gluten intolerance?

- Symptoms from eating gluten or wheat in a person who tests negative for celiac disease
- May be an issue with how the body tolerates certain carbohydrates
- Evaluation for other digestive health disorders needs to be considered
Research on the diet in IBS
# Celiac vs Gluten Intolerance

<table>
<thead>
<tr>
<th>Celiac Disease</th>
<th>Gluten Intolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immune reaction causing destruction of the small intestine</td>
<td>Inability to digest certain carbohydrates. Lining of intestine is healthy</td>
</tr>
<tr>
<td>Causes severe GI distress and other symptoms</td>
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</tr>
<tr>
<td>Diet must be 100% without gluten</td>
<td>Diet can contain some gluten as tolerated</td>
</tr>
<tr>
<td>Risk of nutritional problems</td>
<td>No nutritional risk as long as diet remains balanced</td>
</tr>
<tr>
<td>Risk of bone density issues</td>
<td>No risk of bone density issues</td>
</tr>
<tr>
<td>Small risks of cancer</td>
<td>No risk of cancer</td>
</tr>
<tr>
<td>Family members at risk of the problem</td>
<td>Family members not at risk of the problem</td>
</tr>
</tbody>
</table>
What are the odds of a family member having Celiac Disease?

- Twins: 75%
- Two 1\textsuperscript{st} degree relatives: 17%
- One 1\textsuperscript{st} degree relative: 5-11%

Symptomatic relatives should be tested

Is there a health benefit to going “gluten free”

- Not necessarily
- Risk of low dietary fiber from the diet
- Substitute foods contain more calories
- Celebrities on the diet are eating more fruit and lean protein; less carbs; hence the weight loss
Where to start

GLUTEN FREE LIVING
NOW WHAT?!?

- This may be a relief after years of symptoms
- This will be overwhelming
- There will be a learning curve
NOW WHAT?!?

This problem likely has been going on for a long time. Issue needs attention, but will take time to correct. Mistakes will happen.

Goal is zero tolerance by at least 4 months

Lifestyle changes take time

Focus on the big picture; not the minutia

Do not intentionally cheat
Identify Food Already in your diet

Identifying foods you already eat that are gluten free.

- Favorite meat, vegetables
- Dairy bothers some patients. Yogurt and cheese less lactose than ice cream and milk.

You do not only have to shop at a special store for all of your food. Do not raid the gluten free aisle. It will turn you off to the diet.
Step 2: Get resources

Get resources to educate yourself. Start reading

“Gluten Free for Dummies”

University of Chicago:  
http://www.cureceliacdisease.org/

Celiac Disease Foundation  
http://www.celiac.org/

Ask questions and advocate for yourself
Step 3: Learn Food Labels

- Pay attention to what you are eating
- Additives can contain gluten- sauces, seasonings and some preservatives
- Get a safe additive list and put in your kitchen pantry
- Not everything that is gluten free is labeled as such
- Things actually labeled “Gluten Free” are safe under new federal legislation
Step 4: Start a log

- Log foods that you like and know to be gluten free
- Write down brands when you make recipes
Step 5: Go out to eat

- Call ahead of time and do some research ahead of time so things go smoothly.
- When making a reservation notify them of the celiac disease and ask about cross contamination.
- Look ahead to get an idea of what may be safe.
- Tell waiter again on arrival and ask them to make note to the kitchen staff.
Step 6: Consider baking

- Different baked goods require different mixtures of flour
- Land ‘O Lakes has a good mix
- “Cup for Cup flour”
- Many cookbooks will require complex flour mixtures to make one recipe; do not start here
Step 7: Examine non food items

- Toothpaste, mouthwash, lipstick/balm
- Make up (debatable)
Step 8: Medications

- Very difficult
- Not all medications are gluten free
- Some use gluten in the capsule to bind the medication together

- A daily multivitamin and Vitamin D supplement is typically advised
  - Brands are labeled
Step 9: Cross-Contamination

- Do not worry about this until the diet is mastered
- Slowly replace pots, pans, and cutting boards
- Stainless steel holds less residue
Step 10: Live your life

- Having a chronic health issue is difficult and life changing
- You deserve to be in good health
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