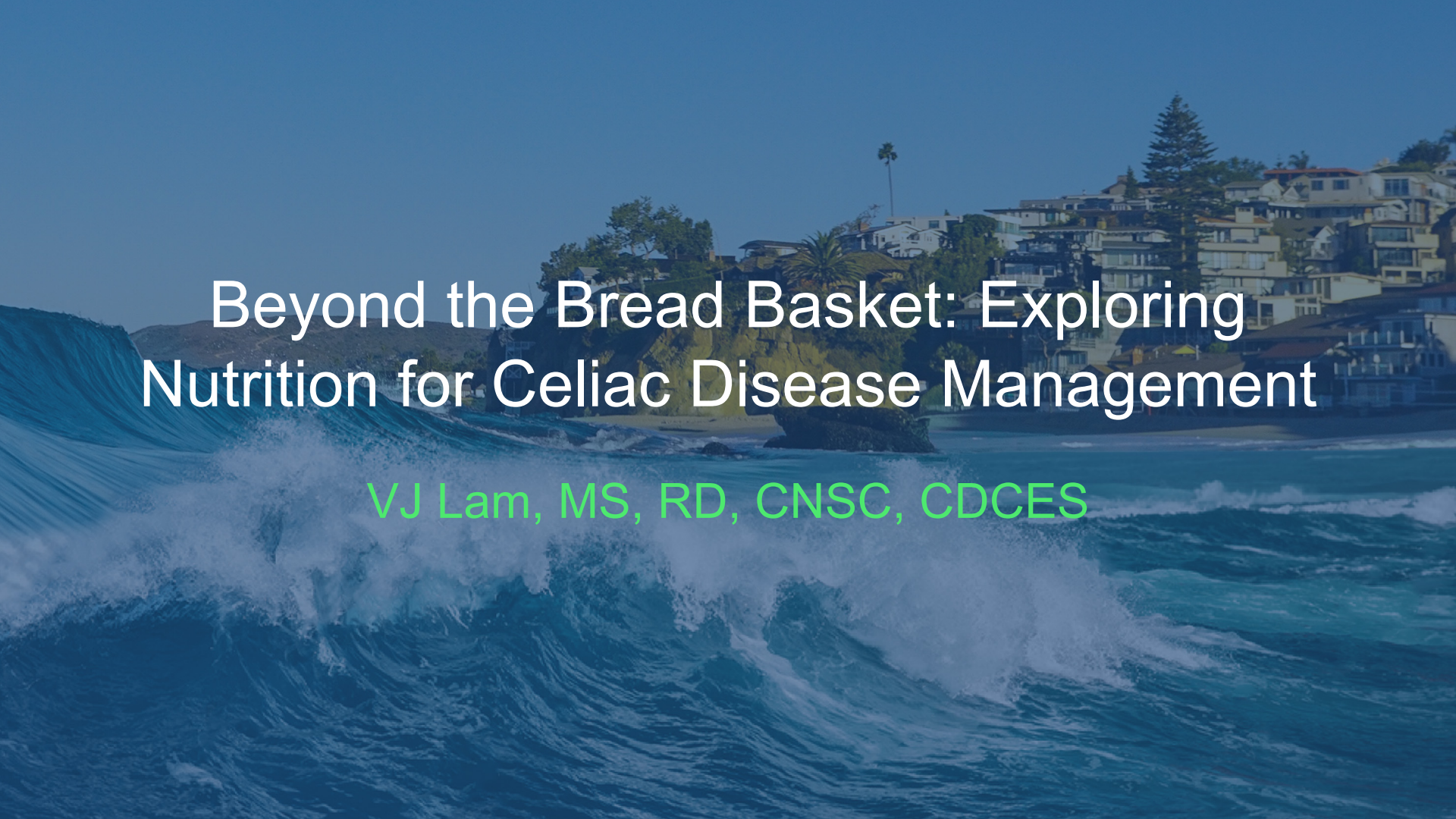


2023 SCSG LGI SYMPOSIUM



A coastal scene with waves in the foreground and houses on a cliff in the background. The image is overlaid with a semi-transparent blue filter. The text is centered over the image.

Beyond the Bread Basket: Exploring Nutrition for Celiac Disease Management

VJ Lam, MS, RD, CNSC, CDCES

Disclosure



- I have no financial disclosure or conflicts of interest with the presented material in this presentation.

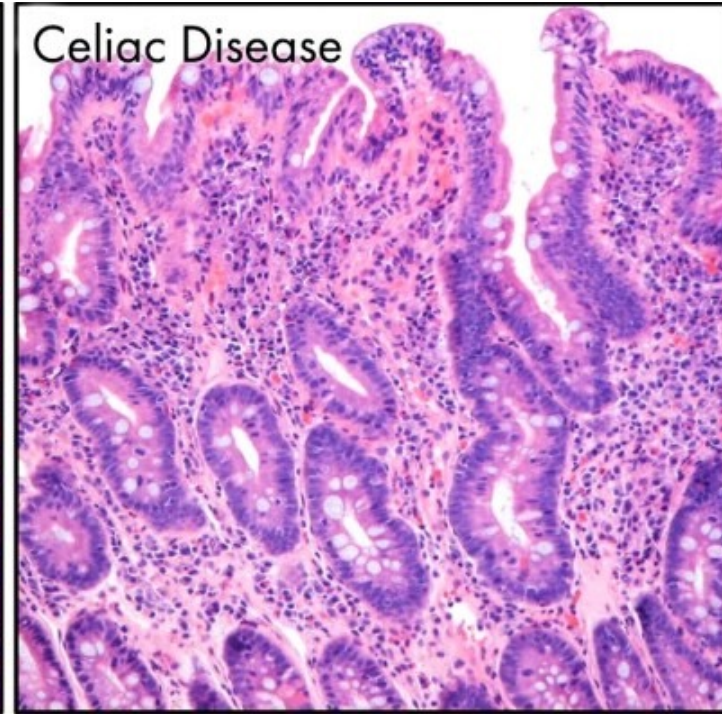
Objectives

1. Identify the clinical presentations of celiac disease, including typical and atypical symptoms.
2. Identify potential sources of gluten in food products.
3. Understand the nutritional implications of celiac disease, and provide strategies based on evidence-based approaches.
4. Recognize the challenges faced by patients in adhering to a gluten-free diet.

Introduction

- Chronic immune-mediated inflammatory disease that damages the small intestine
 - Affects absorption of other nutrients
- Genetically predisposed individuals with sensitivity to gluten
 - Close association with the HLA-DQ2 and DQ8 genes
 - Global prevalence ~1%
 - 1 in 133 Americans

Pathophysiology



Clinical manifestations

| Gastrointestinal | Extraintestinal |
|---|---|
| <p>Diarrhea or steatorrhea Constipation Flatulence Bloating Abdominal pain Weight loss Anorexia</p> | <p>Iron deficiency anemia Osteopenia or osteoporosis Dermatitis herpetiformis Liver and biliary tract disease Neurological disorders Reduced fertility Delayed puberty Failure to thrive Dental enamel hypoplasia</p> |

Clinical manifestations



Differential diagnoses

- Inflammatory bowel disease
- Irritable bowel syndrome
- Cystic fibrosis
- Autoimmune enteropathy
- Wheat allergy
- Protein intolerance
- Lactose intolerance
- Intestinal lymphoma
- Enteritis

Diagnosis

- Serological testing:
 - Anti-tissue transglutaminase antibodies (TTG)
 - Anti-endomysial antibodies (EMA)
 - Human leukocyte antigen (HLA)
- Biopsies:
 - Skin (for those with dermatitis herpetiformis)
 - Intestinal (gold standard)
- Genetic testing
 - HLA-DQ2 and HLA-DQ8

Screening

- High-risk populations:
 - First and second-degree relatives with celiac disease
 - Autoimmune disorders and other conditions:
 - Type 1 diabetes
 - Lupus
 - Rheumatoid arthritis
 - Hashimoto's thyroiditis
 - Graves' disease
 - Down's syndrome

Recommended treatment

Consultation with a skilled dietitian

Education about the disease

Lifelong adherence to a gluten-free diet

Identification and treatment of nutritional deficiencies

Access to an advocacy group

Continuous long-term follow-up by a multidisciplinary team

Recommended treatment

- Cornerstone of treatment is...**a gluten-free diet (GFD)!**
 - Lactose-free diet may be needed initially
- Associated outcomes:
 - ↑ height and weight
 - ↑ bone mineralization
 - ↑ mental well-being
 - Normalization of laboratory parameters
 - GI symptoms can improve within weeks

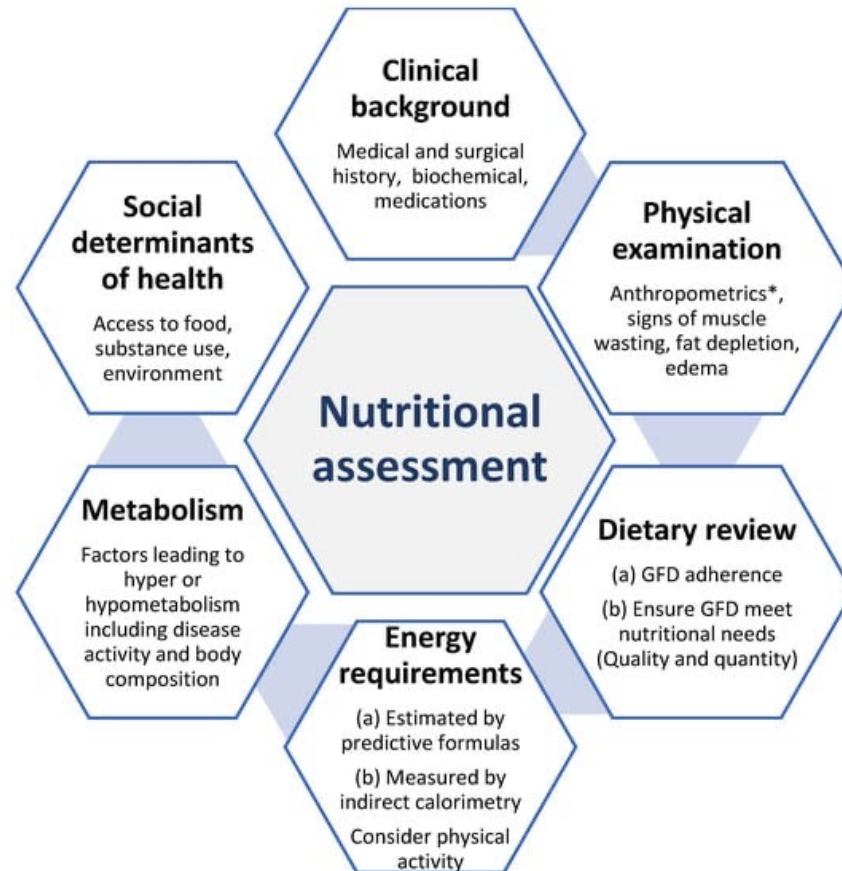
Role of a registered dietitian

- Provide patient education on:
 - What foods to avoid and add
 - Food preparation and shopping
 - Reading food labels
 - Avoiding cross-contact
- Consider:
 - Food preferences and allergies
 - Culture and lifestyle
 - Nutrient requirements for other conditions



*"I'm putting you on a high fiber diet.
You can start by eating this brochure."*

Role of a registered dietitian



What is gluten?

- Structural protein found in certain grains
 - Wheat: Gliadin and glutenin
 - Rye: Secalin
 - Barley: Hordein
- Creates a “chewy” texture
 - Viscosity and extensibility
 - Affected by amount of liquid and movement



Gluten-containing foods

- Any foods containing wheat, rye or barley
 - Pasta
 - Bread
 - Flour tortillas
 - Pizza
 - Cereal
 - Crackers
 - Baked goods
 - Breaded foods



Gluten-containing foods

- Other sources to consider:
 - Canned or boxed soups
 - Gravy, salad dressings
 - Soy sauce and ready-made sauces
 - Beer and malt-containing products
 - Imitation crab
 - Licorice and candy
 - Granola bars
 - Dietary supplements



Natural gluten-free foods

- Fruits
- Vegetables
- Meat and poultry
- Fish and seafood
- Dairy
- Beans, legumes, and nuts



- When in doubt, check the ingredient label!

Gluten-free grains, starches and seeds

- Amaranth
- Arrowroot
- Buckwheat
- Cassava
- Chia
- Chickpea flours
- Corn
- Flax
- Gluten-free oats*
- Millet
- Nut flours
- Potato
- Quinoa
- Rice
- Sorghum
- Soy
- Tapioca
- Taro



Are oats gluten-free?

- Short answer: **YES...if pure and uncontaminated!**
 - Cross-contact issues during harvesting and processing
- Always use oats that are certified “gluten-free”!
 - Up to ½ cup dry rolled oats per day is mostly well-tolerated
- Avenin sensitivity
 - Similar protein to gluten found in oats
 - Avoid oat products if present

Tips on replacing gluten

Flour tortillas



Corn tortillas

Cake or pie
for dessert



Fresh fruit or gelatin

Wheat based pasta



Chickpea pasta or
zucchini noodles

Wheat based cereals



Gluten-free oats
or pseudocereals

Crackers and
cookies



Raw veggies with
hummus, or popcorn

Beware of cross-contact!

- Colanders
- Toasters
- Cutting boards
- Flour sifters
- Airborne flour particles
- Shared containers
- Oven



Gluten-free shopping

- Always read the ingredient list
 - When in doubt – ***do not eat!***
- Check for “gluten-free” label
 - Less than 20 ppm of gluten
 - Bread ~2500 ppm
 - Not all gluten-free foods are labelled
 - FDA: “Free of gluten”, “no gluten”, “without gluten”
 - “Wheat-free” is NOT the same!



Gluten-free shopping

- Wheat and wheat flour
- Bulgur
- Durum
- Semolina
- Rye
- Barley
- Oats or oat flour
- Malt
- Brewer's yeast
- Spelt

| | |
|--------------------------------|-----|
| Fibre / Fibres 2 g | 8 % |
| Sugars / Sucres 6 g | |
| Protein / Protéines 6 g | |
| Vitamin A / Vitamine A | 0 % |
| Vitamin C / Vitamine C | 0 % |
| Calcium / Calcium | % |
| Iron / Fer | % |

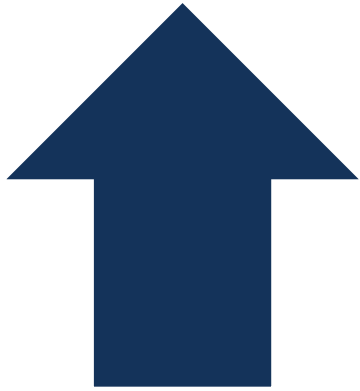
Gluten-containing ingredients (highlighted)

Ingredients: UNBLEACHED ENRICHED FLOUR (WHEAT FLOUR), NIACIN, REDUCED IRON, THIAMINE MONONITRATE {VITAMIN B1}, RIBOFLAVIN {VITAMIN B2, FOLIC ACID}, SOYBEAN OIL, SUGAR, PARTIALLY HYDROGENATED COTTONSEED OIL, SALT, LEAVENING (BAKING SODA AND/OR CALCIUM PHOSPHATE), HIGH FRUCTOSE CORN SYRUP, SOY LECITHIN, MALTED BARLEY FLOUR, NATURAL FLAVOR.
CONTAINS WHEAT, SOY.

“Gluten-free” labels



Gluten-free products

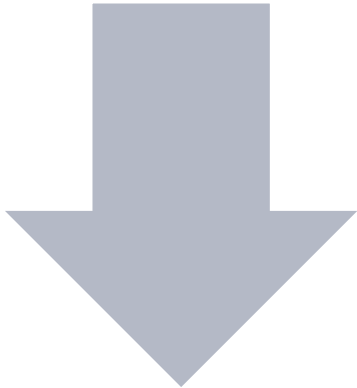


High in...

- Fat
- Sugar
- Sodium
- Cost

Low in...

- Folate
- Zinc
- Iron
- Vitamin B12
- Vitamin D and calcium
- Fiber



Micronutrient deficiencies

| Micronutrient | Common manifestations |
|---------------|-------------------------------------|
| Calcium | Osteopenia Osteoporosis |
| Vitamin D* | |
| Folate | Elevated homocysteine Neuropathy |
| Vitamin B12 | |
| Iron* | Iron deficiency anemia |
| Magnesium | Fatigue, muscle cramps |
| Zinc* | Poor growth |
| Vitamin K | Easy bleeding, bone loss |

*Common in children upon diagnosis

Achieving a balanced GFD

| Proposed Recommendation | Outcome |
|--|--|
| ↑plant-based foods (fruits, vegetables, legumes, nuts, pseudocereals) | ↑fiber and ↑complex carbohydrates ↑vitamins and ↑minerals |
| ↓ultra-processed gluten-free products | ↓saturated fat and ↓sugars |
| Fortify micronutrients in naturally gluten-free foods or provide supplementation | ↑vitamins and ↑minerals |
| ↑dairy products | ↑calcium and ↑vitamin D |
| Continuous monitoring by healthcare team | ↑diet adherence |

Tips on increasing fiber in a GFD

- Replace white rice with gluten-free whole grains (brown or wild rice, quinoa)
- Incorporate cooked legumes into meals
- Replace potato chips with crunchy veggie sticks or popcorn
- Limit rice-based cereals
- Try chickpea or quinoa-based pasta
- Add psyllium supplementation
- Meet daily requirements for fruit and vegetable intake
- Drink plenty of fluids when increasing fiber intake!

Nutrition monitoring

- Every 3-6 months after starting a GFD
 - Diet adherence
 - Growth parameters
 - Onset of new symptoms
 - Complete blood count
 - Liver chemistries
 - Folate, B12
 - Vitamin A, D, E, K
 - Magnesium
 - Iron studies



Non-responders to a GFD

- Defined as individuals with persistent symptoms after 2 years on a GFD
 - 5% are true non-responders (“refractory celiac disease”)
- **#1 reason is poor adherence to a GFD!**
 - ~90% of non-responding cases
 - Children: school setting, social events, low access to safe foods
 - Adults: lack of food prep skills, low knowledge of GFD, low education, late diagnosis, cultural factors, high cost, low motivation

Improving adherence to a GFD

↑ knowledge
of a GFD

Joining a CD
association

↑ patient
education

↑ income
support

↑ self-
efficacy

Patient resources

- Beyond Celiac: beyondceliac.org
- Celiac Disease Foundation: celiac.org
- National Celiac Association: nationalceliac.org
- Gluten Intolerance Group: gluten.org
- Academy of Nutrition and Dietetics: eatright.org/health/health-conditions/celiac-disease
- National Institute of Diabetes and Digestive and Kidney Diseases: niddk.nih.gov/health-information/digestive-diseases/celiac-disease

Summary

- Key treatment for CD is a gluten-free diet
 - Refer to a registered dietitian
- Patient education regarding safe foods is essential
 - Food labeling and how to achieve a balanced GFD
- Regularly assess and monitor for CD-associated symptoms and nutritional deficiencies
 - Supplementation may be needed

Thank you!



Schwadron
" ANOTHER NICE THING ABOUT A MARTINI--
IT'S GLUTEN FREE."