

Gluten-Free Strategies for Clients with Multiple Diet Restrictions

SECOND EDITION

Tricia Thompson, MS, RD



Academy of Nutrition and Dietetics
Pocket Guide to

Gluten-Free Strategies for Clients with Multiple Diet Restrictions

Second Edition

Tricia Thompson, MS, RD

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Reviewers

Pamela Cureton, RDN, LDN
Clinical/Research Dietitian, University of Maryland School of
Medicine, MassGeneral Hospital for Children
Elliott City, MD

Amy Jones, MS, RDN, LD
Chief Clinical Dietitian, Mary Rutan Hospital
Bellefontaine, OH

Jacalyn See, MS, RDN, LD
Clinical Dietitian, Mayo Clinic
Rochester, MN

Carren Sellers, MMSc, RDN, LD, CDE, CLT
Sandy Springs, GA

Suzanne Simpson, RDN
Clinical Dietitian, Celiac Disease Center at Columbia
University
New York, NY

About the Author

Tricia Thompson, MS, RD, is an internationally recognized expert on celiac disease and the gluten-free diet. A nutrition consultant, researcher, and writer, she has authored numerous publications for both scientific and popular readerships, including articles published in the *Journal of the Academy of Nutrition and Dietetics*, *European Journal of Clinical Nutrition*, *Journal of Human Nutrition and Dietetics*, and *New England Journal of Medicine*. She is the author of a variety of books and book chapters on the gluten-free diet, including *The Gluten-Free Nutrition Guide* (McGraw-Hill), and the Academy of Nutrition and Dietetics booklet *Celiac Disease Nutrition Guide*.

Tricia has also been a workgroup member of the Association's Evidence Analysis Library project on celiac disease. She is the creator of the Gluten-Free Dietitian website (www.glutenfreedietitian.com) and the founder of Gluten Free Watchdog (www.glutenfreewatchdog.org).

Tricia has a MS degree in nutrition from Tufts University in Boston, MA, and a BA degree in English Literature from Middlebury College, VT. She completed her dietetic internship at the Frances Stern Nutrition Center at the New England Medical Center in Boston, MA.

Terminology and Abbreviations

ADI	Acceptable Daily Intake
AI	Adequate Intake
AL	alpha-linolenic acid
AWM	Adult Weight Management
BMI	body mass index
CBC	complete blood count
CD	celiac disease
CFR	Code of Federal Regulations
CGM	continuous glucose monitoring
cGMP	current Good Manufacturing Practices
CHD	coronary heart disease
CKD	chronic kidney disease
CPG	compliance policy guide
CoQ10	coenzyme Q10
CRP	C-reactive protein
CVD	cardiovascular disease
DASH	Dietary Approaches to Stop Hypertension
DFE	dietary folate equivalents
DHA	docosahexaenoic acid
DKD	Diabetic Kidney Disease
DLM	disorders of lipid metabolism
DM	diabetes mellitus
DRI	Dietary Reference Intakes
EBNPG	evidence-based nutrition practice guideline
EFA	essential fatty acids

EPA	eicosapentaenoic acid
FALCPA	Food Allergen Labeling and Consumer Protection Act
FDA	Food and Drug Administration
FSIS	Food Safety and Inspection Service
GFR	glomerular filtration rates
GI	glycemic index
GRAS	generally recognized as safe
HbA1c	hemoglobin A1c
HDL	high-density lipoprotein
HDLC	high-density lipoprotein cholesterol
HLA	human leukocyte antigen
HTN	hypertension
IBS	irritable bowel syndrome
ICD	implantable cardioverter defibrillators
LDL	low-density lipoprotein
LDLC	low-density lipoprotein cholesterol
LOV	lacto-ovo vegetarian
LV	lacto-vegetarian
MDI	multiple daily injections
MI	myocardial infarction
MMA	methylmalonic acid
MNT	medical nutrition therapy
NIH	National Institutes of Health
NHLBI	National Heart, Lung, and Blood Institute
RCT	randomized controlled trial
RDA	Recommended Dietary Allowance
RMR	resting metabolic rate

SFAL	saturated fat
SMBg	self-monitoring of blood glucose
TC	total cholesterol
TFA	<i>trans</i> fatty acids
TTB	Alcohol and Tobacco Tax and Trade Bureau
USDA	US Department of Agriculture
VN	vegetarian nutrition
WC	waist circumference
WHR	waist-to-hip ratio

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Preface

Celiac disease affects approximately 1% of the US population. Although only a small percentage of people (around 17%) who actually have celiac disease know that they have it, more and more people are being diagnosed each day. Chances are you are seeing increasing numbers of patients with celiac disease in your practice.

The only treatment for celiac disease is a gluten-free diet. This diet is complicated enough. When it is added to dietary protocols that are either necessary for other medical conditions or due to patient preference, the added restrictions can make adherence that much trickier.

This pocket guide provides easy-to-access information on combining the gluten-free diet with restricted diets for food allergies, diabetes, disorders of lipid metabolism, lactose intolerance, weight management, and vegetarianism. This second edition has been updated throughout, including thorough discussions of the Food and Drug Administration's gluten-free labeling rule and the interim policy of the Alcohol and Tobacco Tax and Trade Bureau on gluten content statements on the labels of alcoholic beverages. The chapter on celiac disease and vegetarianism has been expanded to include information from the Academy of Nutrition and Dietetics Evidence Analysis Library (EAL).

Five areas of interest—celiac disease, diabetes, disorders of lipid metabolism, vegetarian nutrition, and weight management—are covered in the EAL. While the executive summaries of the Evidence-Based Nutrition Practice Guidelines for each of these conditions have been included in this pocket guide, I strongly encourage you to familiarize yourself with the *complete* recommendations available on the EAL website. This is especially important for the celiac disease recommendations.

Throughout the book, specific products are identified as gluten-free and/or free of other ingredients of concern. Brand names are provided as a convenience. Consumers should be advised to always check labels as manufacturers can change product formulations at any time.

If you have any questions about celiac disease and the gluten-free diet, please don't hesitate to contact me at triciathompson@glutenfreedietitian.com.

Tricia Thompson, MS, RD

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Chapter 1

An Introduction to Celiac Disease

Celiac Disease

Celiac disease is a genetically based autoimmune disease.^{1,2} When a person with celiac disease eats gluten, certain sequences of amino acids trigger an immune response that damages the mucosa of the small intestine. This damage results in the following:

- Increased intraepithelial lymphocytes (white blood cells found in the mucosa of the gastrointestinal tract)
- Increased crypt hyperplasia (elongated crypt portion of the mucosal epithelium)
- Villous atrophy (decrease in the length of the villous portion of the mucosal epithelium)

The loss of absorptive surface in the small intestine may result in signs and symptoms of malabsorption. See Box 1.1 for a list of signs and symptoms of celiac disease. Currently the only treatment for this disease is a gluten-free diet (see Chapter 2). For a list of populations at an increased risk for celiac disease, see Box 1.2 (page 3). Diagnosis of celiac disease is discussed in Box 1.3 (page 3).

Box 1.1 Selected Signs and Symptoms of Untreated Celiac Disease^{a,2-9}

Gastrointestinal^b

- Abdominal bloating
- Abdominal pain
- Constipation
- Delayed gastric emptying
- Diarrhea or loose stool
- Heartburn or acid reflux
- Malabsorption (which may lead to vitamin and mineral deficiencies, including iron, vitamin B-12, folate, calcium, and vitamin D)

Continued on next page.

Box 1.1 (cont.) Selected Signs and Symptoms of Untreated Celiac Disease^{a,2-9}

- Nausea
- Reduced gut motility
- Vomiting
- Weight loss (unintentional)

Bone density

- Reduced bone mineral content
- Reduced bone mineral density

Skin

- Dermatitis herpetiformis

Hematological parameters

- Iron deficiency (ferritin concentrations, transferrin saturation)
- Iron deficiency anemia (hemoglobin concentrations)

Pregnancy outcomes

- Increased risk of
 - Infertility
 - Abnormal menstruation
 - Spontaneous abortion and miscarriage

Neurological

- Cerebellar ataxia
- Depression
- Headaches and migraines
- Neuropathy

Pediatric

- Delayed menarche
- Delayed puberty
- Dental enamel defects
- Short stature (unexplained) or poor growth

Other

- Fatigue
- Aphthous ulcers
- Abnormally high liver enzymes

^aList is not all-inclusive.

^bIf you have a patient diagnosed with irritable bowel syndrome (IBS) who has never been screened for celiac disease, it is highly recommended that he or she be tested. According to the American College of Gastroenterology Guidelines on the Diagnosis and Management of Celiac Disease, 20% to 50% of patients with celiac disease met the Rome criteria for IBS.

Box 1.2 Selected Populations at Increased Risk for Celiac Disease^{a,2,3,5,6}

- First- and second-degree relatives of individuals with diagnosed celiac disease
- Individuals with any of the following diseases/conditions:
 - Addison's disease
 - Autoimmune liver disease
 - Autoimmune thyroid disease
 - Down syndrome
 - Microscopic colitis
 - Rheumatoid arthritis
 - Sjogren's syndrome
 - Turner's syndrome
 - Type 1 diabetes mellitus

^aList is not all-inclusive.

Box 1.3 Steps in Diagnosis of Celiac Disease^{a,5,7-9}**Step 1: Serologic testing**

- First-line testing: IgA tTG and/or IgA EMA (IgA DGP also may be used)
- Individuals with confirmed or suspected IgA deficiency: IgG tTG^b

Step 2: Intestinal biopsy

- Histologic findings characteristic of celiac disease^c:
 - Increased intraepithelial lymphocytes
 - Crypt hyperplasia
 - Partial to total villous atrophy

^aFor more information on diagnosis, see reference 5.

^bThe IgG DGP (when available) has become the test of choice among some clinicians when IgA deficiency is suspected or confirmed.⁸ This test also may be useful in the pediatric population.⁹

^cWhile either human leukocyte antigen (HLA) DQ8 or HLA DQ2 is almost always necessary for the development of celiac disease, having either one of these genes does not mean that an individual will develop celiac disease. Approximately 40% of the US population has one of these genes, but only approximately 1% has celiac disease. Because of the high negative predictive value, HLA testing can be used to rule out celiac disease.^{7,9}

Dermatitis Herpetiformis

Dermatitis herpetiformis is the skin form of celiac disease.¹ When a person with dermatitis herpetiformis eats gluten, certain sequences of amino acids trigger an immune response that causes painful skin lesions. These lesions are usually found on both sides of the body in a symmetric pattern and are most often located on pressure points of the skin, such as the elbows and knees. Most people with dermatitis herpetiformis also have damage to the mucosa of the small intestine, although they may not experience gastrointestinal symptoms.

Dermatitis herpetiformis is diagnosed via a biopsy of the skin. Treatment includes a gluten-free diet and possibly medication to control the skin rash.

The medication dapsone (and sulfapyridine for patients who do not tolerate dapsone) may be used to treat skin lesions. Patients taking dapsone must be monitored for side effects, including anemia.¹⁰ Dapsone should not be taken by nursing mothers, and its use is questionable during pregnancy, so the risks and benefits must be weighed.^{10,11} It is important to note that dapsone does not treat or prevent intestinal damage due to gluten ingestion. Only a gluten-free diet will prevent both the skin lesions and damage to the intestinal mucosa.

Non-Celiac Gluten Sensitivity

Non-celiac gluten sensitivity is considered a nonallergic and nonautoimmune response to gluten.^{1,12} Gluten sensitivity does not cause inflammation of the mucosa of the small intestine. However, it may cause gastrointestinal symptoms similar to celiac disease, such as abdominal pain and diarrhea.

Diagnosis of gluten sensitivity remains a diagnosis of exclusion. If an individual tests negative for celiac disease and wheat allergy but is still suspected of having an adverse response to gluten, a trial period on a gluten-free diet can be tried. If symptoms resolve on a gluten-free diet, the individual may be gluten sensitive.

Currently the treatment for non-celiac gluten sensitivity is a gluten-free diet (see Chapter 2). It is important to note that very little research has been conducted on this condition and opinions vary on etiology and treatment. Certain carbohydrates and components of wheat grain other than gluten may play a role in its development.

Academy of Nutrition and Dietetics Evidence-Based Nutrition Practice Guideline for Celiac Disease

Boxes 1.4 through 1.22 (pages 5 to 14) present the major recommendations and ratings for the Academy of Nutrition and Dietetics evidence-based nutrition practice guideline for celiac disease.¹³ The full text of the recommendations is available from the Academy's Evidence Analysis Library (EAL) (www.andeal.org). The EAL is available free of charge to Academy members (see Appendix A for EAL access instructions and Appendix B for a key to the recommendation ratings).

Screening and Referral

Box 1.4 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Medical Nutrition Therapy

Medical nutrition therapy (MNT) provided by a registered dietitian nutritionist (RDN) is strongly recommended for individuals with celiac disease. Consultation with an RDN as part of a team-based approach results in improved self-management.

Rating: Consensus, Imperative

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Nutrition Assessment

Box 1.5 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Assessment of Food/Nutrition-Related History

The RDN should assess the food and nutrition-related history of individuals with celiac disease, including (but not limited to) the following:

- Food and nutrient intake (eg, diet history, diet experience, and macronutrient or micronutrient intake, specifically calcium, iron, vitamin B complex, and vitamin D)
- Medication and herbal supplement use
- Knowledge, beliefs, or attitudes (eg, readiness to change nutrition-related behaviors)
- Behavior (eg, social network)
- Factors affecting access to food and food- and nutrition-related supplies (eg, safe food and meal availability).

Assessment of the above factors is needed to effectively determine nutrition diagnoses and plan the nutrition intervention. Intake of gluten may result in gastrointestinal symptoms, malabsorption, and villous atrophy.

Rating: Strong, Imperative

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Box 1.6 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Assessment of Biochemical Data and Results of Medical Procedures

The RDN should assess the biochemical data and review the results of medical procedures in individuals with celiac disease, regardless of presentation and clinical symptoms, including (but not limited to) the following:

- Gastrointestinal profile (eg, intestinal biopsy [or skin biopsy in the case of dermatitis herpetiformis] and celiac antibodies)
- Nutritional anemia profile (eg, folate, ferritin, and vitamin B-12)
- Vitamin profile (eg, thiamin, vitamin B-6, and 25-hydroxyvitamin D)
- Mineral profile (eg, copper and zinc)
- Lipid profile
- Electrolyte and renal profile

Untreated celiac disease results in villous atrophy and malabsorption. The use of effective techniques to assess nutritional status is essential to the prevention and treatment of malnutrition and the presence of iron deficiency anemia.

Rating: Strong, Imperative

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Box 1.7 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Bone Density Screening

The RDN should recommend bone density screening for adults with celiac disease within the first year. Clinical trials and cross-sectional studies have reported reduced bone mineral content and bone mineral density in untreated adults with celiac disease.

Rating: Strong, Conditional

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Box 1.8 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Assessment of Factors Affecting Quality of Life

The RDN should assess the factors affecting the quality of life of individuals with celiac disease when completing a comprehensive client history, which includes a medical history (eg, gastrointestinal, immune, neurological, and psychological) and social history (eg, socioeconomic factors, religion, social and medical support, and daily stress level). Individuals with celiac disease may not attain the same level of quality of life as the general population, due to social inconveniences of following a gluten-free dietary pattern.

Rating: Strong, Imperative

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Box 1.9 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Assessment of Gastrointestinal Symptoms

The RDN should assess gastrointestinal symptoms (such as type, frequency, and volume of bowel function; abdominal pain and bloating; nausea or vomiting; reduced gut motility; and delayed gastric emptying) in individuals with celiac disease. Several studies have reported that people with celiac disease (treated and untreated) are more likely to experience gastrointestinal symptoms than are healthy control subjects.

Rating: Strong, Imperative

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Box 1.10 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Assessment of Other Disease States

The RDN should assess for the presence of other disease states, such as thyroid conditions, other autoimmune and endocrinologic disorders, and diabetes when implementing MNT. Identification of all nutritional issues is optimal to integrate MNT into overall disease management for individuals with celiac disease.

Rating: Consensus, Imperative

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Nutrition Intervention**Box 1.11 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Gluten-Free Dietary Pattern**

The RDN should advise and educate individuals with celiac disease to be compliant with a gluten-free dietary pattern. Research on individuals with celiac disease reports that longterm compliance with a gluten-free dietary pattern improves outcomes related to bone density, iron deficiency anemia, villous atrophy, gastrointestinal and neurological symptoms, pregnancy outcomes, and quality of life.

Rating: Strong, Imperative

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Box 1.12 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Consumption of Whole/Enriched Gluten-Free Grains and Products

The RDN should advise individuals with celiac disease to consume whole or enriched gluten-free grains and products such as brown rice, wild rice, buckwheat, quinoa, amaranth, millet, sorghum, teff, and so on. Research reports that adherence to the gluten-free dietary pattern may result in a diet that is low in carbohydrates, iron, folate, niacin, zinc, and fiber.

Rating: Strong, Imperative

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Box 1.13 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Addition of Multivitamin and Mineral Supplement

If usual food intake shows nutritional inadequacies that cannot be alleviated through improved eating habits, the RDN should advise individuals with celiac disease to consume a daily, gluten-free, age- and sex-specific multivitamin and mineral supplement.

Rating: Strong, Conditional

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Box 1.14 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Inclusion of Gluten-Free Oats as Tolerated

The RDN should advise individuals with celiac disease who enjoy and can tolerate gluten-free oats to gradually include them in their gluten-free dietary pattern. Research on individuals with celiac disease reports that incorporating oats uncontaminated with wheat, barley, or rye at intake levels of approximately 50 g dry oats per day is generally safe and improves compliance with the gluten-free dietary pattern.

Rating: Fair, Conditional

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Box 1.15 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Calcium/Vitamin D for Reduced Bone Density

For adults with reduced bone density or reduced serum levels of 25-hydroxyvitamin D, the RDN should advise the consumption of additional calcium and vitamin D through food or gluten-free supplements. Studies in adults have shown that a gluten-free dietary pattern improves, but may not normalize, bone mineral density.

Rating: Strong, Conditional

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Box 1.16 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Iron Supplementation for Iron Deficiency Anemia

For individuals with iron deficiency anemia and celiac disease, the RDN should advise the consumption of a daily gluten-free multivitamin with iron or additional individualized therapeutic doses of iron. Studies report that iron supplementation may be necessary to achieve normal values of hematological parameters.

Rating: Strong, Conditional

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Box 1.17 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Provide Resources and Education on Label Reading

The RDN should provide resources and educate individuals with celiac disease about reviewing the ingredients on labels of food and supplements using current publications, including those from the US Food and Drug Administration, for identification and avoidance of sources of gluten, namely wheat, rye, barley, malt, and oats (unless oats are gluten-free). Education about the disease is optimal to integrate MNT into overall disease management for individuals with celiac disease.

Rating: Consensus, Imperative

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Box 1.18 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Coordination of Care

The RDN should implement MNT and coordinate nutrition care with a team of clinical professionals. Depending on the coexisting conditions of the individual with celiac disease, consultation with gastroenterologists, endocrinologists, allergists, dermatologists, hepatologists, pharmacists, social workers, and so on, may be warranted. An interdisciplinary team approach is optimal to integrate MNT into overall disease management for individuals with celiac disease.

Rating: Consensus, Imperative

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Box 1.19 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Education on Food Cross-Contamination

The RDN should educate individuals with celiac disease regarding cross-contamination in gluten-free food preparation within manufacturing plants, restaurants, and home kitchens. Education about the disease is optimal to integrate MNT into overall disease management for individuals with celiac disease.

Rating: Consensus, Imperative

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Nutrition Monitoring and Evaluation

Box 1.20 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Dietary Compliance

The RDN should monitor the following to evaluate dietary compliance:

- Gluten-free dietary pattern
- Antibody levels
- Potential exposure to cross-contamination
- Hidden sources of gluten in foods, medications, and supplements

Intake of gluten may result in gastrointestinal symptoms, malabsorption, and villous atrophy.

Rating: Strong, Imperative

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

Box 1.21 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Factors Affecting Quality of Life

The RDN, at every encounter, should monitor and evaluate the factors affecting the quality of life of individuals with celiac disease, reviewing changes in client status, which includes medical status (eg, gastrointestinal, immune, neurological, and psychological) and social status (eg, socioeconomic factors, religion, social and medical support, and daily stress level). Individuals with celiac disease may not attain the same level of quality of life as the general population due to social inconveniences of following a gluten-free dietary pattern.

Rating: Strong, Imperative

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Box 1.22 Evidence-Based Nutrition Practice Guideline for Celiac Disease: Gastrointestinal Symptoms

The RDN, after ruling out gluten exposure, should monitor and evaluate persistent gastrointestinal symptoms in individuals with celiac disease, such as bloating, gas, constipation, and diarrhea, as there may be other potential causes, such as leaky gut; lactose, fructose, and carbohydrate intolerances; bacterial overgrowth; refractory sprue; related cancers; and other gastrointestinal diseases and conditions. Several studies have reported that people with celiac disease (treated and untreated) are more likely to experience gastrointestinal symptoms than healthy controls; compliance with a gluten-free diet reduces but may not eliminate these symptoms.

Rating: Fair, Imperative

Reprinted with permission from Academy of Nutrition and Dietetics Evidence Analysis Library. Celiac Disease (CD) Guideline (2009). www.andeal.org/topic.cfm?menu=5279&cat=3677.

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Chapter 2

The Gluten-Free Diet

Definition of Gluten

From the standpoint of celiac disease, dermatitis herpetiformis, and non-celiac gluten sensitivity, **gluten** is considered an umbrella term for certain sequences of amino acids found in the grains wheat, barley, and rye. In actuality, gluten is a protein found only in wheat that is made up of the prolamin **gliadin** and the glutelin **glutenin**. The **prolamins** of barley and rye are termed **hordein** and **secalin**, respectively. Prolamins (ie, storage proteins in grains) are found in many grain foods, including those that are inherently gluten-free, such as corn and rice.

Only the grains whose prolamins (and glutelins) contain amino acid sequences harmful to individuals with celiac disease must be avoided. See Box 2.1 for a list of grains containing gluten.

Box 2.1 Grains Containing Gluten

- All types of wheat, including spelt, einkorn, emmer, kamut, and durum
- Barley
- Rye
- Triticale (a hybrid grain made from wheat and rye)

Definition of the Gluten-Free Diet

As followed in the United States, a gluten-free diet is free of all but miniscule amounts of protein from the grains wheat, barley, and rye. Under the US Food and Drug Administration's (FDA) rule for gluten-free labeling (discussed later in this chapter), food labeled as gluten-free in the United States must contain less than 20 parts per million (ppm) of gluten.¹ Box 2.2 (pages 18–19) provides a list of selected naturally gluten-free grains, flours, and starches.²⁻⁶

Appendix A

Quick Guide to Accessing the Evidence Analysis Library

It is very important that all registered dietitian nutritionists (RDNs) counseling clients with celiac disease familiarize themselves with the celiac disease topic and evidence-based nutrition practice guidelines available on the Academy of Nutrition and Dietetics Evidence Analysis Library (EAL). Follow these step-by-step instructions to access the information:

1. Go to <http://www.andeal.org/>.
2. Login or register (it is free for Academy of Nutrition and Dietetics members).
3. The first tab on the far left is “Projects.” To access the celiac disease topic, click on “Celiac Disease.”
4. From this page you can access both the Celiac Disease Evidence Analysis Project and the Celiac Disease Evidence-Based Nutrition Practice Guideline.
5. In the left-hand corner, you will see a box with various headings under celiac disease. Clicking on the headings will bring you to a separate page (to go back, just hit the back button on your computer).
6. For example, if you click on “Effectiveness of a Gluten-Free Dietary Pattern,” you will be able to click on the topics covered under this heading: Bone Density, Iron Deficiency Anemia, Villous Atrophy, Pregnancy Outcomes, Neurological Outcomes, Gastrointestinal Outcomes, and Quality of Life.
7. Clicking on each of these headings will bring you to a page containing the evidence analysis question, the conclusion statement for that question, evidence summary, and search plan and results.

8. To access the Nutrition Practice Guidelines developed from these research questions and conclusion statements, click on the “Guidelines” tab at the top of the page (next to the “Library” tab).
9. To access the celiac disease guideline, click on “Celiac Disease Guideline.”
10. To access the recommendations, click on “Major Recommendations” in either the box on the left-hand side of the screen or the link in the body of the page.

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Gluten-Free Strategies for Clients with Multiple Diet Restrictions

SECOND EDITION

The second edition of the *Academy of Nutrition and Dietetics Pocket Guide to Gluten-Free Strategies for Clients with Multiple Diet Restrictions* provides important updates to the successful first edition while continuing to provide recommendations, food lists, menus, and resources the registered dietitian nutritionist needs to combine a gluten-free diet with meal planning for :

- Food allergies
- Diabetes
- Disorders of lipid metabolism
- Lactose intolerance
- Weight management
- Vegetarianism

This new edition includes information on the US Food and Drug Administration's gluten-free labeling rules and the Alcohol and Tobacco Tax and Trade Bureau's interim policy on gluten content statements on the labels of alcoholic beverages.



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