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The difference between celiac disease, non-celiac gluten intolerances and allergies to wheat can be very confusing. Gluten intolerance, gluten allergy and celiac disease all share a common treatment plan at this time; however with the advent of potential medications for celiac disease, this could change.

Why does it matter what you are dealing with? First, if you have celiac disease, in a few years there may be alternative drug therapies available to you. Drug therapy is designed to create specific reactions based on the disease it is treating. Since non-celiac gluten intolerances are not the same as celiac disease, these therapies will not be available to them. Further, research studies focus on specific admission criteria. To date, these revolve around celiac disease as defined by medical standards. Researchers are beginning to acknowledge and recognize that there are people who have a gluten intolerance that is not diagnosable as celiac disease according to the accepted definition of diagnosis – small intestine (or skin) biopsy consistent with celiac disease and a return to health on a gluten-free diet.

Food sensitivities are defined as having an adverse reaction to a food or a food group. Sensitivities may be caused by different types of food reactions, such as true allergies, intolerances or some other type of reaction, such as food poisoning. Food aversions generally are a psychological reaction to food. The first division of food sensitivities is into allergies and intolerances.

Allergies can be of two types: IgE mediated and T-cell mediated.

Allergies: Allergies affect the lives of millions of people (up to 8% of children and 4% of adults) around the world and appear to be growing at an alarming rate. The true incidence of food allergies is lower than the number of reported allergies by patients, approximately 11 million Americans. One out of three people either believe they have a food allergy or will modify their or their family's diet accordingly and without a formal diagnosis.

The foods to which adults or children usually react are those foods they eat often. In Japan, for example, rice allergy is frequent. In Scandinavia, codfish allergy is common. A food allergy is an abnormal reaction to a food triggered by the body's immune system. Common food allergies are an immune system reaction.

IgE-mediated allergies is the group of food allergies that we are most familiar with. IgE-mediated allergies are also known as "common allergies." IgE (immunoglobulin E) is an antibody, a type of protein that works against a specific food. The FDA identifies the following as the top eight allergens – wheat, eggs, soy, milk, peanuts, tree nuts, shell fish and fish, although there are hundreds of foods that have been identified as allergens. Most children with common food allergies to milk, eggs, soy, and wheat will outgrow their allergy, however adults usually keep their allergies for life. Allergies to peanuts, tree nuts, and fish are usually life-long. Shellfish allergies often develop during later childhood or adulthood. The most common food allergy among adults is shellfish. Peanuts and tree nuts account for most of the severe cases of food allergy.

Wheat allergy or gluten allergy: Depending on what you read and whom you talk with in the allergy research community, you may hear that there is no such thing as a gluten allergy, the reaction in IgE-mediated reactions to wheat are to different proteins. Others say that wheat allergies don't exist and that what people with a wheat allergy have is an IgE reaction to gluten. So, it is possible that there may be a form of non-celiac gluten intolerance that is a true IgE allergic reaction and not celiac disease. Celiac disease is a T-cell-

Allergies are immune reactions to proteins and can be life threatening or cause damage to the intestine. Intolerances are not immune reactions and do not cause death or damage to the intestines.

mediated immune reaction, but also has an autoimmune component.

Intolerances: Food reactions that don't involve the immune system are commonly called food intolerances. Of all the individuals who have any type of food sensitivity, most have food intolerances. Food intolerances that are toxic include bacterial food poisoning which can cause diarrhea, nausea and vomiting. Non-toxic non-immunologic reactions can be divided into three categories: metabolic, pharmacological, and idiopathic reactions.

Metabolic reactions: Metabolic intolerances involve a change in the body's ability to breakdown a food or food substance. The best-known metabolic intolerance is lactose intolerance. In this condition, the body is not able to produce the enzyme needed to effectively breakdown the milk sugar lactose found in dairy foods. People with lactose intolerance may experience gas, bloating, and abdominal pain if they eat too much milk products. It is possible that some people just don't digest wheat or other gluten grains well. This supports the theory that our digestive tract was never designed to eat grains such as wheat. It is therefore possible to have a form of non-celiac gluten intolerance in which the body is unable to adequately digest grains with gluten.

Pharmacological reactions: These occur when a naturally occurring food component in a food causes a chemical or 'drug-like' reaction between the gut and brain. An example would be the "burning" sensation experienced when eating foods such as chili peppers. MSG can cause flushing, sensations of warmth, headache, chest discomfort, and feelings of detachment. Sulfites sometimes pose problems for people with severe asthma. Alcohol and caffeine are other examples of foods/food components that give people pharmacological reactions. The use of a gluten-free diet as part of the treatment in autism deals with the theory of gluten (and casein) having a drug-like effect. Therefore this could be another form of non-celiac gluten intolerance. Similar preliminary research has been published related to a gluten-free diet with multiple sclerosis and rheumatoid arthritis. Testing of these people shows that they do not have celiac disease.

Idiopathic reaction: There are some reactions that are unexplainable and unconfirmed by science at this time. So we just don't know why some people experience fatigue, behavior problems, and many other symptoms that they attribute to foods. Some examples of idiopathic reactions are to specific food colors, dyes, and flavors. Of course, non-celiac gluten intolerance also fits here. There are just some things we don't know, including why some people just feel better when they don't eat gluten.

Aspartame, monosodium glutamate, and several food dyes have been studied extensively. Scientific evidence shows they do not cause allergic reactions. Studying food intolerances is more challenging and it would be difficult to know if non-toxic, non-immune reactions actually occur.

Do I have celiac disease or non-celiac gluten intolerance?

Diagnosis is key to knowing the answer to this question. This is also the most important reason not to start a gluten-free diet before being tested and getting a diagnosis. Diagnosis for celiac disease involves blood screening followed by small intestine biopsy. The gold standard of diagnosis for celiac disease is the small intestine biopsy. Without it as proof of diagnosis, people wanting to participate in celiac drug studies usually do not meet the criteria for inclusion.

Diagnosis of IgE food allergies is done through RAST or skin prick testing and a double-blind placebo test using the allergen. Double-blind placebo test is not done as often as it should be and cannot be done with persons experiencing anaphylactic reactions. This limits the ability to do research on allergens.

Diagnosis of food intolerances is a differential diagnosis, basically ruling out other possible causes of the symptoms. This might include testing for other conditions, such as celiac disease, keeping a food diary and trying an elimination diet to determine the offending food.

Non-celiac gluten intolerance is real. It is a condition that we need to study more. Knowing what you are dealing with could determine how you control your condition. As you can see in Table 1 (page 11), with celiac disease and IgG food allergies, strict adherence to a gluten-free diet is required. That may not be the case for persons with non-celiac gluten intolerance. It is possible that one day, when we have a better understanding of non-celiac gluten intolerance, that we will see gluten-free diets that model diabetes or renal diets where the diet prescription is individualized based on the type of diagnosis of the gluten-sensitive person. Maybe it is possible that natural gluten enzymes will help persons with non-celiac disease digest gluten better, similar to those who use Lactaid to help with lactose intolerance. There are a lot of unanswered questions and the potential for further changes in how various gluten sensitive conditions are managed in the future.

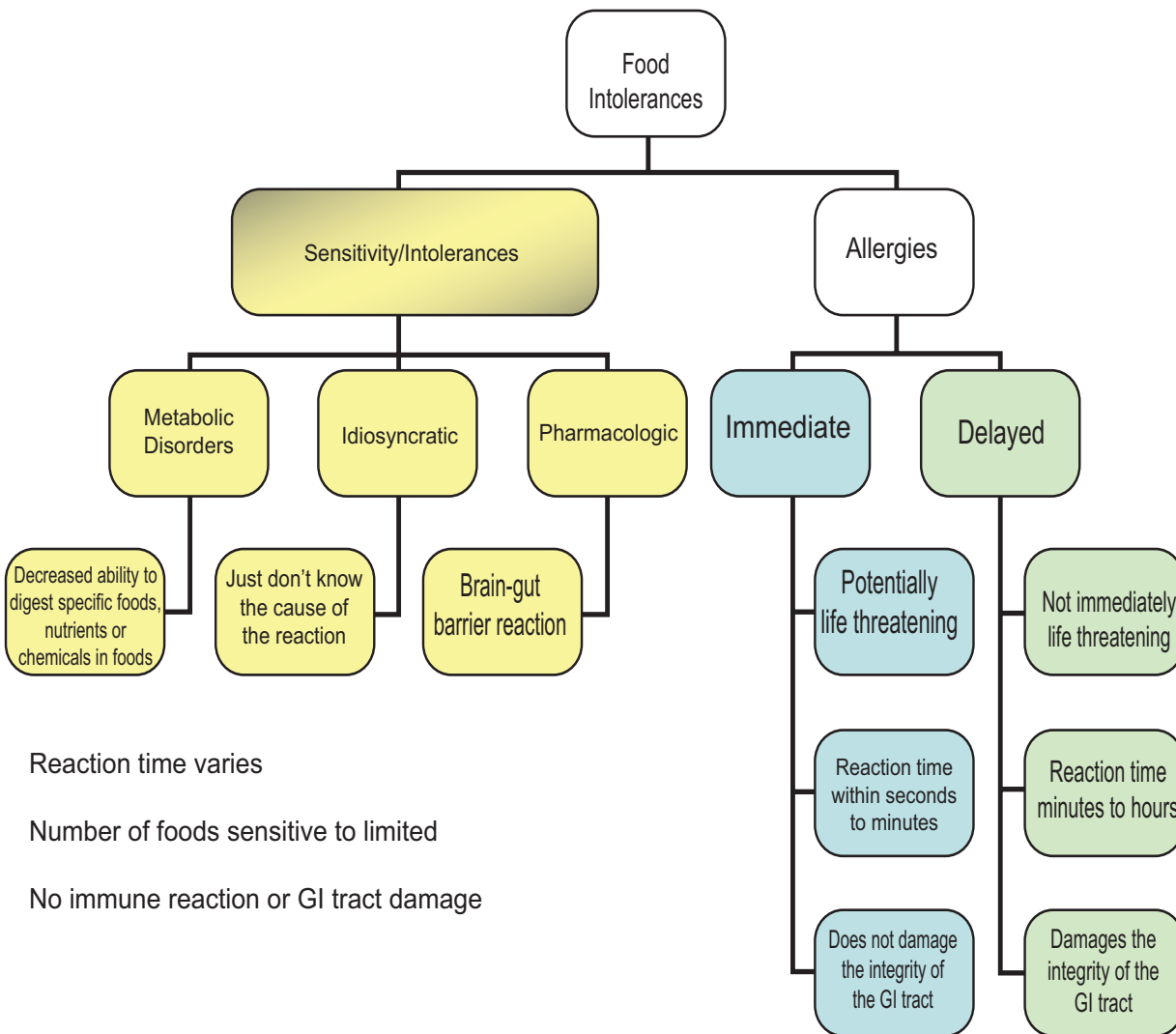
Celiac, Allergy or Non-Celiac Gluten Intolerance: What is the Difference? | continued



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Table 1: Comparing allergies, celiac disease and food intolerances

	IgE Allergy	Celiac Disease	Non-celiac Gluten Intolerance
Reaction to:	Proteins or a chemical in the food IMMUNE	Proteins – gliadin and glutenins IMMUNE (also autoimmune)	Proteins, carbohydrates, other chemicals in the food Average 4-5 foods Not immune or autoimmune
Reaction time	FAST Immediate: Minutes to hours Exposure – reaction may vary in severity, time of onset, and may be affected by when the food was eaten Can be exercise-induced in some	SLOW Delayed: Approx 30 minutes to 24 hours	SLOW Delayed reactions up to several hours Difficult to detect Not well understood
Reactions	May affect different areas of the body with different exposures. Potentially deadly. GI - IBS, indigestion, abdominal pain, bloating, nausea, vomiting, and diarrhea Systemic - fever, fatigue, sweating, and chills Lungs - food-induced bronchitis and asthma, sneezing, runny nose, and shortness of breath Joints - food related arthritis Muscles and connective tissue - pain, stiffness, and swelling Skin - itching, rashes, hives, redness, swelling, and scaling as in eczema and psoriasis Brain - disorganized, disturbed or foggy thinking, constant headaches, migraines. Anaphylaxis - affects several areas of the body at the same time. These might include the skin: flushing, itching, or hives; the airway: swelling of the throat, difficulty talking or breathing; the intestines: nausea, vomiting, or diarrhea; and the heart – low blood pressure or unconsciousness and possibly death.	May affect different areas of the body with different exposures or a change in reaction symptoms over time. Damages the intestine. Does not cause death GI - IBS, indigestion, abdominal pain, bloating, nausea, vomiting, and diarrhea Systemic - fever, fatigue, sweating, and chills Lungs - food-induced bronchitis and asthma, sneezing, runny nose, and shortness of breath Joints - food related arthritis Muscles and connective tissue - pain, stiffness, and swelling Skin - itching, rashes, hives, redness, swelling, and scaling as in eczema and psoriasis Brain - disorganized, disturbed or foggy thinking, constant headaches, migraines.	May affect different areas of the body with different exposures. An irritant. Does not cause damage to the intestine nor death. GI - IBS, indigestion, abdominal pain, bloating, nausea, vomiting, and diarrhea Systemic - fever, fatigue, sweating, and chills Lungs - food-induced bronchitis and asthma, sneezing, runny nose, and shortness of breath Joints - food related arthritis Muscles and connective tissue - pain, stiffness, and swelling Skin - itching, rashes, hives, redness, swelling, and scaling as in eczema and psoriasis Brain - disorganized, disturbed or foggy thinking, constant headaches, migraines.
Detection	RAST, Skin prick, Double-blind placebo	Screening: Blood (tTG and/or, EMA to IgE. IgG optional) Positive biopsy consistent with celiac disease or DH	Differential diagnosis, “rule out”, elimination diet trial
Treatment	Strict avoidance of allergen food Life long or until allergen gone as shown with testing	Strict avoidance of gluten Life long avoidance	Avoidance or limitation of food



Reaction time varies

Number of foods sensitive to limited

No immune reaction or GI tract damage

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Other helpful information is available at www.GLUTEN.net.

Advances in celiac disease are fast-paced. If this document is more than 2 years old, please visit our Web site for updated documents.

This information should not be used to diagnose or treat anemia or celiac disease. For questions about anemia and celiac disease consult your healthcare team when considering this information.

Please consider your local GIG branch as another resource.

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GIG is a nonprofit 501c3 national organization providing support for persons with gluten intolerances, in order to live healthy, productive lives. GIG Branches provide support at a local level.

To make a donation or become a volunteer to GIG, visit our Web site or call the office at 253-833-6655.

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