CONDITION

Celiac disease

Learn how celiac disease affects the small intestine, which symptoms it can cause, how it is diagnosed, and how a gluten-free diet supports recovery.

WHAT IT IS
Long-term autoimmune condition triggered by gluten

BODY SYSTEM
Digestive system

MAIN SYMPTOMS
Diarrhea or constipation, abdominal pain and bloating, tiredness, weight loss

WHAT CAUSES IT
Genetic susceptibility and abnormal immune response

HOW IT IS DIAGNOSED
Antibody blood tests and small-intestinal biopsy

MAIN TREATMENT
Strict lifelong gluten-free diet

CAN IT BE CURED?
No, lifelong diet controls it

IS IT AN EMERGENCY?
Sometimes, with severe dehydration

LONG-TERM OUTLOOK
Intestine often heals with treatment

Overview

Celiac disease is a long-term autoimmune condition triggered by gluten. Gluten is a group of proteins found in wheat, barley, and rye. "Sprue" is an older term for the condition.

When a person with celiac disease eats gluten, the immune system mistakenly attacks the lining of the small intestine. This damages tiny, finger-shaped structures called villi. Villi help the body absorb nutrients from food. When they are injured, the body may not absorb enough iron, calcium, vitamins, and other nutrients.

Celiac disease can cause digestive symptoms, but it may also affect the skin, bones, nervous system, blood, and reproductive health. Some people have few or no noticeable symptoms even though intestinal damage is present.

Celiac disease is different from a wheat allergy and from non-celiac gluten sensitivity. A wheat allergy is an allergic reaction to wheat proteins and can sometimes cause rapid symptoms. Non-celiac gluten sensitivity may cause symptoms after eating gluten or wheat, but it does not cause the same autoimmune intestinal injury.

Diagnosis matters because untreated celiac disease can lead to nutritional deficiencies and other health problems. The main treatment is a strict, lifelong gluten-free diet. The intestine often heals after gluten is removed, although recovery may take time.

Symptoms

Symptoms vary widely. They may begin in childhood or adulthood and can change over time. Digestive symptoms are common, but some people mainly have symptoms outside the digestive system.

Possible digestive symptoms include:

Symptoms related to poor nutrient absorption or inflammation may include:

Some people develop dermatitis herpetiformis. This is an intensely itchy, blistering rash linked to celiac disease. It most often appears on the elbows, knees, buttocks, back, or scalp.

Children may also have poor growth, delayed puberty, irritability, dental enamel changes, or difficulty gaining weight. Some children are overweight, so body size alone cannot confirm or exclude the condition.

These symptoms have many possible causes. They do not establish a diagnosis of celiac disease.

Seek routine medical evaluation for persistent digestive symptoms, unexplained anemia, poor growth, ongoing weight loss, or a recurring itchy blistering rash. Seek urgent care for signs of serious dehydration, repeated vomiting with an inability to keep down fluids, severe or worsening abdominal pain, fainting, or bloody or black stools. These symptoms are not specific to celiac disease and may have another cause that needs prompt assessment.

- Ongoing diarrhea or constipation
- Abdominal pain, bloating, or excess gas
- Nausea or vomiting
- Pale, greasy, bulky, or unusually foul-smelling stools
- Unexplained weight loss
- Reduced appetite

- Tiredness or weakness
- Iron-deficiency anemia, which means too few healthy red blood cells because of low iron
- Headaches
- Mouth ulcers
- Bone or joint pain
- Tingling or numbness in the hands or feet
- Problems with balance
- Difficulty concentrating or "brain fog"
- Mood changes
- Menstrual or fertility problems

Causes and risk factors

Celiac disease develops from a combination of genetic susceptibility, gluten exposure, and an abnormal immune response. Almost everyone with celiac disease carries certain versions of immune-system genes called HLA-DQ2 or HLA-DQ8. However, many people carry these genes and never develop celiac disease. Genetic susceptibility alone is not a diagnosis.

The condition can run in families. Parents, children, and siblings of a person with celiac disease have a higher risk and may be offered testing even if they feel well.

Celiac disease is also associated with certain other conditions, including:

A person can develop celiac disease after years of eating gluten without obvious problems. The exact reason symptoms begin at a particular time is often unclear.

Celiac disease is not caused by eating too much bread, stress, or personal food choices. It is also not contagious.

- Type 1 diabetes
- Autoimmune thyroid disease
- Selective immunoglobulin A, or IgA, deficiency
- Down syndrome
- Turner syndrome
- Williams syndrome

- Autoimmune liver disease

Diagnosis

Testing should usually occur while the person is still eating gluten. Starting a gluten-free diet before testing can allow antibodies and intestinal injury to improve, making results harder to interpret. Anyone who has already removed gluten should discuss the next steps with a clinician rather than restarting it without guidance.

Blood testing is generally the first step. The preferred initial test for most people is the tissue transglutaminase IgA antibody, often written as tTG-IgA. A total IgA level is commonly checked at the same time because IgA deficiency can make an IgA-based test falsely negative.

If IgA is low, a clinician may use IgG-based tests, such as tTG-IgG or deamidated gliadin peptide IgG. An endomysial antibody test may help clarify some results. No blood test should be interpreted without considering symptoms, medical history, gluten intake, and possible IgA deficiency.

Most adults with positive or strongly suspicious tests are referred for an upper endoscopy. During this procedure, a flexible camera is passed through the mouth into the first part of the small intestine while the person receives sedation. Several tiny tissue samples, called biopsies, are collected. A pathologist examines them for villous damage and other characteristic changes.

Some children may be diagnosed without a biopsy if they meet strict laboratory and clinical criteria. This approach should be directed by a pediatric gastroenterology specialist. The criteria are not simply a single positive antibody result.

A skin biopsy from normal-looking skin next to a rash can help diagnose dermatitis herpetiformis. People with this rash are treated as having celiac disease even if digestive symptoms are absent.

HLA-DQ2 and HLA-DQ8 genetic testing is not a routine confirmation test because these genes are common. A negative result makes celiac disease very unlikely, so testing can be useful when blood tests and biopsies disagree or when someone started a gluten-free diet before evaluation.

Other tests may look for effects of the disease. These can include a complete blood count, iron studies, liver tests, and levels of folate, vitamin B12, vitamin D, calcium, or other nutrients. Bone density testing may be appropriate for some people.

Treatment and management

The treatment for celiac disease is a strict, lifelong gluten-free diet. This stops the immune reaction, allows the small intestine to heal, and lowers the risk of complications. Feeling better after avoiding gluten does not by itself confirm celiac disease, and people should ideally complete diagnostic testing first.

Wheat, barley, and rye must be avoided. Foods made with related ingredients, including malt made from barley, also contain gluten. Common sources include many breads, pastas, cereals, baked goods, beers, sauces, soups, and processed foods.

Naturally gluten-free foods include fruits, vegetables, plain meat and fish, eggs, dairy products, beans, nuts, rice, corn, potatoes, quinoa, and buckwheat. Packaged versions still need label review because gluten-containing ingredients or cross-contact may be present.

Oats do not naturally contain the same gluten proteins, but ordinary oats are often contaminated with wheat, barley, or rye during farming or processing. Only oats labeled gluten-free should be considered. A small number of people may not tolerate oats even when they are uncontaminated, so their introduction should be discussed with the care team.

Meeting with a dietitian experienced in celiac disease can make the diet safer and more practical. A dietitian can explain labels, balanced nutrition, eating away from home, and ways to prevent cross-contact. Cross-contact happens when gluten-free food touches gluten through shared toasters, cutting boards, utensils, fryers, bulk bins, or preparation surfaces.

In the United States, foods labeled "gluten-free" must meet the Food and Drug Administration's labeling standard. However, not every naturally gluten-free food needs to carry that label. Meat, poultry, and certain egg products are regulated under different labeling systems, so asking a dietitian how to read different labels can be useful.

Medicines, vitamins, and supplements should also be reviewed. Gluten is uncommon in most medicines, but ingredients and manufacturing processes can change. A pharmacist or manufacturer can help verify uncertain products.

Nutrient deficiencies may need treatment. The choice and amount of iron, vitamin D, calcium, folate, vitamin B12, or other supplements should be based on test results and professional advice rather than self-treatment.

Dermatitis herpetiformis improves with a gluten-free diet, but the rash may take time to settle. A clinician may prescribe medication for faster symptom control. These medicines require medical supervision and laboratory monitoring.

If symptoms continue despite a gluten-free diet, the first step is often a detailed review for hidden gluten exposure. A clinician may also investigate other causes, such as lactose intolerance, irritable bowel syndrome, microscopic colitis, pancreatic problems, or small

intestinal bacterial overgrowth. Rarely, intestinal injury continues despite careful gluten avoidance; this is called refractory celiac disease and requires specialist care.

Complications

Untreated or poorly controlled celiac disease may cause iron-deficiency anemia, low vitamin levels, weight loss, and protein-calorie malnutrition. Reduced calcium and vitamin D absorption can contribute to osteopenia or osteoporosis, meaning lower bone strength and a greater fracture risk.

Children may have delayed growth or puberty. Adults may experience fertility or pregnancy-related problems, although these symptoms have many possible causes.

Nerve problems, liver test abnormalities, and reduced spleen function can occur. Persistent intestinal inflammation is also associated with a higher risk of certain uncommon cancers, including intestinal lymphoma and small-bowel cancer. The overall risk for an individual cannot be predicted from symptoms alone, and effective treatment appears to reduce important long-term risks.

Follow up

Follow-up helps confirm that symptoms are improving, nutritional problems are being corrected, and gluten exposure is being minimized. An early visit is often used to review the diet, laboratory results, and access to a knowledgeable dietitian. Further visits are based on symptoms, test results, age, and recovery.

Celiac antibody levels are commonly repeated over time. Falling levels support reduced gluten exposure, but a normal result does not prove that the intestine has fully healed. Persistently elevated levels may suggest ongoing exposure and should prompt a careful review rather than blame.

Blood counts, iron, vitamins, liver tests, or bone health may be monitored when they were abnormal at diagnosis. Some adults may need a repeat endoscopy and biopsy, especially if symptoms or laboratory abnormalities continue. Children are often followed for growth, development, and nutritional status.

Close relatives should ask their own clinicians whether screening is appropriate. They should not begin a gluten-free diet only because one family member has been diagnosed.

Contact the care team routinely if symptoms do not improve, return after improving, or make it difficult to eat a balanced diet. More urgent assessment is appropriate for severe weakness,

significant dehydration, repeated vomiting, fainting, severe abdominal pain, or gastrointestinal bleeding.

Sources

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