

## Endoscopy

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### Key Points

- It is widely accepted that detecting small intestinal villous atrophy (decrease in size, or wasting) is a core step in confirming the diagnosis of celiac disease.<sup>1</sup> Biopsies of the small intestine are obtained with the help of a safe and quick procedure called an esophago-gastro-duodenoscopy (EGD) or endoscopy.
  - An endoscopy is routinely used to evaluate gastrointestinal symptoms and allows direct visualization of the upper gastrointestinal tract (esophagus, stomach, beginning portion of the small intestine called the duodenum) through a flexible, narrow tube with a camera attached at the end called an endoscope. The endoscope is inserted through the mouth and moved through the stomach into the duodenum.
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### Prior to Endoscopy:

- Before having an endoscopy for celiac disease, it is important to continue to eat gluten-containing food items. In the absence of gluten in your diet, your small intestinal villi can heal, leading to non-specific findings on the biopsies taken during the exam.
- This test is performed on an empty stomach and you are asked to take nothing by mouth after midnight, the night before the procedure. You are also required to arrange for someone to drive you home after the procedure since you will receive sedation through your peripheral veins. In most cases, you may need to take half a day or a full day off of work.

### On the Day of Endoscopy:

- After arrival at the hospital/endoscopy center, you will change into a procedure gown. A quick evaluation of your physical condition and vital signs (pulse, blood pressure, temperature) will be done. A doctor will explain the risks and benefits of the procedure to you and you will be asked to sign a consent form. An intravenous cannula (a thin plastic tube for insertion into the body to draw off fluid or to introduce medication) will be placed and you will receive fluids and sedatives through it. A bite block will be placed in your mouth to protect your teeth from the endoscope.

## Endoscopy:

- The procedure will be performed in a darkened room after you have received adequate sedation. A thin, flexible endoscope will be inserted into your mouth and advanced to your duodenum under direct visualization. After careful inspection of the tissue of your small intestine, multiple biopsies (two biopsies from the duodenal bulb and at least six biopsies from the second portion of the duodenum)<sup>1</sup> will be taken, using biopsy forceps. Biopsies are the size of quinoa grains.
- The test lasts anywhere between 10 – 15 minutes in most cases. Immediately after the test you can expect to receive a printed report with pictures of your gastrointestinal tract and recommendations, if any.
- Pathologists review the biopsies taken during your endoscopy for the presence of celiac disease. Most skilled pathologists can identify changes in the tissue of your small intestine that show celiac disease. In certain cases, however, findings of celiac disease can overlap with other gastrointestinal illnesses.<sup>2</sup> In such cases, it is very important that the pathologist has skilled training and experience in gastrointestinal pathology, typically found in a medical center with specialized care.
- An initial or baseline evaluation provides a valuable point of comparison if the patient is later resistant to treatment.<sup>3</sup>

## Post Endoscopy:

- After the procedure, you will be brought to the recovery area. While the peak effect of sedation occurs during the exam, you may feel groggy for the next few hours. You will be able to eat and drink after the exam and resume your daily activities. However, due to the effect of sedation, you should not operate machinery, sign important documents such as legal documents, or drive a car, among other restrictions. As a result, you will need to arrange for someone to bring you home.

## Possible Risks:

- While an endoscopy is a relatively safe procedure, in extremely rare cases patients can have complications such as a tear called a perforation, an infection, and/or bleeding from the procedure. In some cases, these complications may require surgical correction.

## In The Future:

Scientists and clinicians are working hard to reduce the need for endoscopy in the diagnosis of celiac disease. The ultimate goal is to reduce the cost and burden of celiac disease diagnosis through the use of non-invasive tests. A consensus guideline produced by the European Society of Pediatric Gastroenterology, Hepatology, and Nutrition recently proposed a triple test strategy to avoid intestinal biopsies for children.<sup>4</sup>

Candidates for diagnosis **without** biopsy should have symptoms, have an IgA tTG level greater than 10 times above the upper limit of normal, test positive for anti-EmA in a separate blood sample, and have the HLA DQ2 gene. The World Gastroenterological Association guidelines recommended a no-biopsy algorithm for countries with limited health care resources.<sup>2</sup> The table below shows features of various societies' guidelines:

Guideline	Guideline Design: Population	Intestinal Biopsy	Recommended Blood Tests	Comments and Remarks	References
ESPGHAN	Expert consensus (children)	Standard but not mandatory in all cases (see comments /remarks)	Total IgA and Anti-tTG	<p>Recommends against anti-DGP for initial testing; IgG-based test indicated if total IgA is low/undetectable</p> <p>If anti-tTG &gt;10x upper level of normal (ULN) and family agrees, biopsy not necessary provided EMA-IgA tests are positive in second blood sample. If anti-tTG &lt;10x ULN, biopsy should be considered. Tests for HLA DQ2/8 not obligatory criteria.</p>	2
WGO	Expert Consensus (Adults)	Standard but not mandatory in all cases (see comments /remarks)	Anti-tTG, anti-EMA and anti-DGP	Uses a diagnostic cascade based on available local resources. Allows for diagnosis without biopsy	3

				under certain conditions	
ACG	Expert consensus evidence-based (children and adults)	Mandatory	Anti-tTG for individuals >2 y; if high probability of CD, anti-tTG, anti-DGP, total IgA	Recommends combining Anti-tTG and anti-DGP to screen children <2 y	1
BSG	Expert consensus evidence-based (adults)	Mandatory	Anti-tTG, anti-EMA, and anti-DGP	Recommends that biopsy is essential for diagnosis and cannot be replaced by serology alone.	4
ESSCD	Expert consensus evidence based (adults)	Mandatory	Anti-tTG	Duodenal biopsy is an essential component of the diagnostic evaluation for adults with suspected CD and is recommended to confirm the diagnosis.	5
AGA	Expert consensus evidence based (adults)	Standard but not mandatory in all cases (see comments /remarks)	Anti-TTG and anti-EMA on a second bloodwork	TG2-IgA, at high levels (>10 upper normal limit) is a reliable and accurate test for diagnosing active CD. When such a strongly positive TG2-IgA is combined with a positive endomysial antibody in a second blood sample, the positive predictive value	6

				for CD is virtually 100%. In adults, esophagogastroduodenoscopy (EGD) and duodenal biopsies may then be performed for purposes of differential diagnosis, such as evaluation of other potential disorders.	
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ACG, American College of Gastroenterology; BSG, British Society of Gastroenterology; ESPGHAN, European Society of Pediatric Gastroenterology, Hepatology and Nutrition; WGO, World Gastroenterological Organization.

#### References:

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7. Husby S, Murray JA, Katzka DA. AGA clinical practice update on diagnosis and monitoring of celiac disease—changing utility of serology and histologic measures: expert review. *Gastroenterology*. 2019;156(4):885-9.