

Diagnosis of eosinophil associated gastrointestinal disorders (EGID)

Eosinophilic esophagitis, eosinophilic gastroenteritis, eosinophilic colitis

1. Symptoms

Symptoms of EGID can vary depending on the part of the gastrointestinal tract that is involved and the severity of the disease. Symptoms may also vary based on age. These symptoms include:

- Nausea or Vomiting
- Diarrhea
- Failure to thrive (poor growth or weight loss)
- Abdominal or chest pain
- Reflux that does not respond to usual therapy (which includes proton pump inhibitors, a medicine which stops acid production)
- Difficulty swallowing (dysphagia)
- Food impactions (food gets stuck in the throat)
- Delayed emptying of the stomach (gastroparesis)
- Anorexia (poor appetite)
- Bloating
- Anemia
- Blood in the stool
- Malnutrition

Since none of these symptoms are specific for EGID, and many occur at times in healthy children or adults, the diagnosis is generally sought only after the symptoms have failed to resolve.

2. Diagnosis

Diagnosis of EGID may be made when the following are present:

- Abnormal gastrointestinal symptoms as defined above
- **Eosinophilic infiltration in 1 or more areas of the GI tract.** In healthy people small numbers of eosinophils may be present in many areas of the GI tract. Small numbers of eosinophils may be found in the esophagus with reflux. Higher numbers are seen with eosinophilic esophagitis
- Absence of another identified cause of eosinophilia (such as a parasite infection)
- No eosinophilic involvement of other organs

Biopsy is the ONLY way to confirm the diagnosis of EGID.

3. What tests are commonly performed?

Laboratory

- Complete blood count with differential – eosinophils counts are often mildly elevated, but may be normal. Anemia (low blood count) may be present
- Serum IgE, allergy testing
- Stool for infection, blood, fat, protein

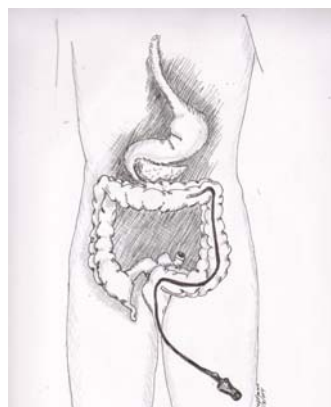
Endoscopy and Biopsy

The diagnosis of EGID must be confirmed with tissue biopsies done at the time of endoscopy. **Typically, the endoscopy and biopsies are performed after treatment for possible gastroesophageal reflux disease (GERD) with proton pump inhibitors or H2 blockers to minimize confusion between the two diseases.** Depending on the symptoms, biopsies may be

obtained by an [upper endoscopy](#), a [lower endoscopy](#) or both. **Biopsy is the only way to diagnose eosinophil associated gastrointestinal disorders.**



Upper endoscopy



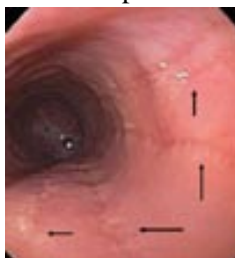
**Lower endoscopy:
colonoscopy**

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The gastroenterologist will look at the GI tract and take multiple small samples (biopsies) which are sent to the pathology laboratory for further examination. Multiple biopsies will be taken from each area of the GI tract, including areas that may appear normal. The pathologist will look at the samples under the microscope and describe any abnormalities. A high number of eosinophils (counted per high power field) suggests the diagnosis of EGID. The pathologist will also look for the location of the eosinophils, changes in the tissue layers (basal layer hyperplasia), and degranulation (spilling of the contents of the eosinophils). Eosinophils may be normally found in small numbers in all areas of the GI tract except the esophagus. Pathology findings in eosinophilic esophagitis are discussed in detail by Dr. Margaret Collins in the 2006 first quarter issue of *EoSolutions*, [available in the newsletter section of the website. \(LINK\)](#)

Generally, the physician will exclude infection as the cause by sending biopsy and stool specimens to test for giardia or other parasites, which can cause eosinophils in the GI tract. In some situations, elevated blood levels of eosinophils may lead to further evaluation for [hypereosinophilic syndrome](#). High levels of blood eosinophils do not mean hypereosinophilic syndrome is present.

The examples below are of endoscopic findings that may be seen in eosinophilic esophagitis*



A. Furrows



B. Rings



C. White plaques

*Images courtesy of Dr. Chris Liacouras, Children's Hospital of Philadelphia

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For more detailed information on colonoscopy and upper endoscopy visit

- the **American Gastroenterological Association** <http://www.gastro.org/> patient center
- **Children's Hospital of Philadelphia**
- http://www.chop.edu/consumer/your_child/condition_section_index.jsp?id=-8602
- Cincinnati Children's Hospital and Medical Center
<http://www.cincinnatichildrens.org/health/info/abdomen/procedure/gi-endoscopy.htm>

Allergy Testing (skin prick, RAST and patch testing)

Once the diagnosis of EGID is confirmed, allergy testing will usually be requested. In many situations, avoiding 'allergens' that trigger the eosinophils will be effective treatment. The reactions to foods are not always "immediate hypersensitivity" (IgE-mediated). This means that a food can be consumed with no obvious reaction to it, but over a period of days to weeks the eosinophils triggered by the food will cause inflammation and injury to the intestines and esophagus. For this reason, food logs (keeping track of foods and symptoms) may not identify the offending food. Allergy testing will include skin prick testing and may also include patch testing (to look for delayed reactions).

- **Skin prick** testing is for IgE- mediated reactions ('immediate hypersensitivity'). Skin prick testing involves 'scratching' small amounts of pure food or environmental allergens into the skin. A 'wheal' (bump) greater than the negative control indicates a positive test. Both a positive control (one that should cause a wheal) and negative control (should not cause a wheal) are used.
- **Skin patch** testing can be used when testing for delayed food reactions. Skin patch testing is most commonly used to test for dermatologic (skin) reactions. When used for food reactions, small amounts of a pure food are placed in tiny cups, which are then taped to the back. The foods will be chosen based on the patient's diet, previous reactions, and prior skin prick test results. The patches are removed after 48 hours and read at 72 hours.



Example of patch testing

- **RAST** (Radioallergosorbent test) is not as helpful for identifying foods that cause EGID. Instead, RAST may be used to confirm an immediate reaction to a food (for instance, hives following a peanut butter sandwich). RAST testing identifies IgE antibodies for a specific food.

The results of these tests will be used to guide treatment. [Elimination and elemental diets](#) are discussed in more detail in the treatment section. Sometimes, no allergens are identified and the disease is thought to be ‘non-allergic’ or due to unidentified allergens.

A detailed discussion of food allergy testing by Dr. Sampson can be found in the second quarter 2006 Apfed *EoSolutions* newsletter. ([LINK](#))

4. Why is it so difficult to obtain a diagnosis?

EGID is a relatively uncommon disorder that doctors may not be familiar with. The diagnosis of EGID is often delayed, sometimes for years, because there are no ‘classic symptoms’ or findings of EGID. Blood eosinophil levels may or may not be elevated. There is no typical endoscopic appearance. Histopathologic criteria have not yet been widely accepted.

Although doctors may have minor disagreements concerning specific criteria, the diagnosis can be confirmed with biopsies in the majority of cases. In rare situations, it may be difficult to distinguish eosinophilic esophagitis from gastroesophageal reflux disease (GERD), or other secondary forms of EGID. Working closely with your health care team is the best way to ensure a proper and timely diagnosis.

5. Related problems & treatment complications (reflux, gastroparesis, osteoporosis, inflammatory bowel disease)

Reflux (GERD)

EGID, particularly EE, can also be associated with reflux. The cause of specific symptoms may be difficult to determine when both EE and reflux have been diagnosed together. If there is question of reflux contributing to symptoms, other studies may be done. This may include a barium swallow or pH probe.

- **Barium swallow**, sometimes referred to as an upper GI series, involves drinking a chalky-tasting liquid (barium) that is visible on x-rays. The anatomy of the esophagus, stomach and intestine can be seen, but a barium swallow is not the diagnostic test for reflux. No drinking or eating is allowed before the test. Pictures are taken with the x-ray machine while you lie on a table. The doctor may ask you to hold your breath or turn while the pictures are being taken.
- **pH probe** involves placing a small flexible tube through the nose and into the esophagus. Acid levels (pH) will be measured for 24 hours to determine how often reflux is occurring. You may not eat or drink before the test. You may be asked to stop certain medications (proton pump inhibitors or H2-blockers) before the test.

Gastroparesis (delayed emptying)

Eosinophilic gastroenteritis may also cause delayed emptying of the stomach (gastroparesis)

- A **Gastric emptying study** can confirm if this is present. This involves eating/drinking a meal that is ‘tagged’ with a radioactive substance. Pictures are then taken with a special camera to record the amount of time it takes the meal to leave the stomach. The patient’s emptying time is compared to the expected normal time for liquids and/or solid food.

Osteoporosis (brittle bones from bone loss) is a complication of both malnutrition (inadequate intake or absorption of important nutrients) and of long-term treatment with steroids.

- **Bone density** studies (DEXA scan) look for osteoporosis. The DEXA scan uses special x-rays to determine the density (thickness) of the bones. The results are compared to normal values for age and gender.

6. Other tests and terminology

Eosinophilic inflammation of the small and large intestines may cause malabsorption (inadequate absorption of essential nutrients). Rarely, the possibility of inflammatory bowel disease is raised, in which case additional blood work and testing may be performed. Information on the diagnosis of Crohn's disease and ulcerative colitis can be found at the Crohn's and Colitis Foundation of America. <http://www.ccfa.org/>

- The Apfed [glossary](#) contains an alphabetical listing describing medical terms
- A description of commonly performed gastroenterology tests can be found listed alphabetically at:
http://www.chop.edu/consumer/your_child/condition_section_index.jsp?id=-8602

Diagrams of endoscopy procedures are available from the American Gastroenterological Association website (brochures)

<http://www.gastro.org/>

and from The Children's Hospital of Philadelphia <http://www.chop.edu/consumer/index.jsp>

7. Future Directions

- Diagnostic criteria for eosinophilic esophagitis
- Non-invasive tests to diagnose and follow disease activity

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