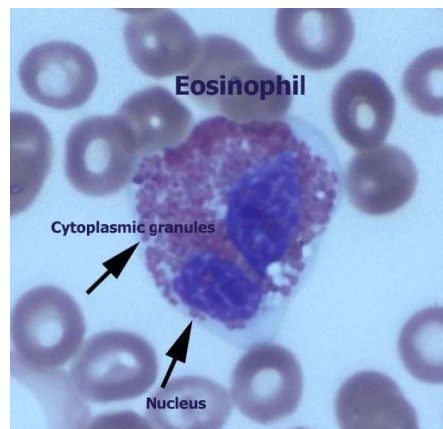


## Eosinophilic Esophagitis (EE)

### What is an Eosinophil?

Eosinophils, a type of white blood cell, are an important part of the immune system, helping us fight off certain types of infections, such as parasites. Many different problems can cause high numbers of eosinophils in the blood including allergies (food and environmental), certain infections (caused by parasites), eosinophil associated gastrointestinal disorders, leukemia, and other problems. When eosinophils occur in higher than normal numbers in the body, without a known cause, an eosinophilic disorder may be present.

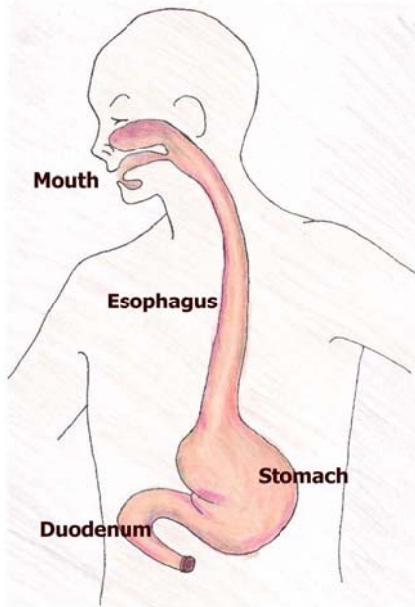
Eosinophilic disorders are further defined by the area affected. For instance, eosinophilic esophagitis means abnormal numbers of eosinophils in the esophagus. Separate files are available for individual disorders: Eosinophilic esophagitis, Eosinophil-associated gastrointestinal disorders, and Hypereosinophilic syndrome.



*Image 1: Eosinophil, Courtesy of Dr. Margaret Collins*

### What is EE?

Eosinophilic esophagitis is characterized by the infiltration of a large number of eosinophils, a type of white blood cell, in the esophagus (the tube connecting the mouth to the stomach). Eosinophils are an important part of the immune system, helping us fight off certain types of infections, such as parasites. A variety of stimuli may trigger this abnormal production and accumulation of eosinophils, including certain foods. Eosinophilic esophagitis means eosinophils infiltrating the esophagus, -itis means inflammation. People with EE commonly have other allergic diseases such as asthma or eczema. EE affects people of all ages, gender and ethnic backgrounds. In certain families, there may be an inherited (genetic) tendency. EE is thought to be the most common type of eosinophil-associated gastrointestinal disorder.



*Image 2: Upper gastrointestinal tract*

Eosinophils are not normally present in the esophagus, although they may be found in small numbers in other areas of the gastrointestinal tract. Diseases other than EE can cause eosinophils in the esophagus including gastroesophageal reflux diseases (GERD), food allergy, and inflammatory bowel disease.

#### **What are the symptoms of EE?**

Symptoms vary from one individual to the next and may differ depending on age. Vomiting may occur more commonly in young children and difficulty swallowing in older individuals. Common symptoms include:

- Reflux that does not respond to usual therapy (which includes proton pump inhibitors, a medicine which stops acid production in the stomach)
- Dysphagia (difficulty swallowing)
- Food impactions (food gets stuck in the throat)
- Nausea and Vomiting
- Failure to thrive (poor growth or weight loss)
- Abdominal or chest pain
- Poor appetite
- Malnutrition
- Difficulty sleeping

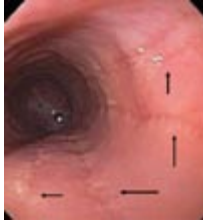
#### **How is EE diagnosed?**

In individuals with symptoms consistent with EE, an upper **endoscopy with biopsies** is needed for the diagnosis. The endoscopy is often performed after treatment with reflux medications have failed to relieve the symptoms. Medications for reflux include proton pump inhibitors or histamine-2 receptor blockers.

During an upper endoscopy, the gastroenterologist looks at the esophagus, stomach and duodenum (first part of the small bowel) through an endoscope (small tube inserted through the mouth) and takes multiple small tissue samples (biopsies) which the pathologist reviews under the microscope. Even if the esophagus appears

normal, the biopsies may show EE. A high number of eosinophils (counted per high power field) suggest the diagnosis of EE. GERD also causes eosinophils in the esophagus, but typically far fewer. The pathologist will also look for tissue injury, swelling and thickening of the esophageal layers. With EE, the eosinophils are limited to the esophagus and not found in other areas. Once the diagnosis of EE is confirmed, **food allergy testing** is typically recommended to guide treatment. Skin prick testing to different foods is the most common type of allergy testing.

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*

For more detailed information on colonoscopy and upper endoscopy visit the **American Gastroenterological Association** <http://www.gastro.org/>  
<http://www.gastro.org/clinicalRes/brochures/uppergi.html>  
<http://www.gastro.org/clinicalRes/brochures/colonoscopy.html>

### **Allergy Testing (skin prick, patch testing and RAST)**

Once the diagnosis of EE is confirmed, allergy testing is typically 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 esophagus. For this reason, food logs (keeping track of foods and symptoms) may not identify the offending food. The skin 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 EE. 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.

#### **Why is it so difficult to obtain a diagnosis?**

EE is a relatively uncommon disorder that doctors may not encounter often. The diagnosis of EE is often delayed, sometimes for years, because of lack of awareness of these disorders.

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). Working closely with your health care team is the best way to ensure a proper and timely diagnosis.

[To view Images of upper and lower endoscopy](#)  
[For more information on EGID diagnosis.pdf](#)

#### **Treatment**

- Dietary
- Medications

Most children and adults with EE respond favorably to dietary treatments. The dietary restrictions are guided by food allergy testing and 'fine-tuned' with food trials once the symptoms have resolved.

**Elimination** diets, in which all 'positive' foods on allergy testing are removed from the diet, are one type of dietary treatment. An elimination diet may be the only treatment needed for some individuals with eosinophilic esophagitis.  
[\(for more information on Restricted diets.pdf\)](#)

**Elemental** diets, in which all sources of protein are removed from the diet, are another dietary therapy. The elemental diet includes only an amino acid formula (building blocks of protein), no whole or partial proteins. Simple sugars, salt and oils are permitted on an elemental diet.

More information on [Elemental diets.pdf](#)

Children and adults who rely in part, or completely, on an elemental amino acid based formula may have a difficult time drinking enough of the formula. To maintain proper nutrition, some may require tube feedings directly into the stomach (enteral feeds).

View an [illustration of an NG tube](#)

For more detailed information [on living with Feeding tubes.pdf](#),

**Food trials** involve adding back one ingredient at a time to determine specific foods causing a reaction. Food trials begin after symptoms resolve and eosinophils have cleared.

**Medications** for EE most commonly include steroids to control inflammation and suppress the eosinophils. Steroids are used if dietary measures do not resolve the symptoms. Steroids can be taken orally or topically (swallowed from an asthma inhaler).

For more detailed information on the treatment of EE and related disorders [Treatment of EGID.pdf](#)

Patients with EE may require **additional endoscopies and biopsies** to assess how the esophagus is responding to specific treatment.

The initial diagnosis of EE can be overwhelming and often affects the entire family. A positive attitude and a focus on non-food activities go a long way in learning to live with EE. With proper treatment, individuals with EE can lead a normal life.

More information on school issues

- [Guide to celebrating without food.pdf](#)
- [IEP/504 plans.pdf](#)
- [post-secondary school.pdf](#)
- [student health forms.pdf](#)

Guide for students with chronic illness

<http://www.nhlbi.nih.gov/health/public/lung/asthma/guidfam.pdf>

Resources for healthcare professionals and consumers

[Reading list for healthcare professionals.pdf](#)

[Link to clinical trials page.](#)

Updated 5-30-05, Author: Wendy Book, mail@apfed.org

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