



# Eosinophilic Gastrointestinal Disease

Eosinophils (e-o-sin-o-fils) are a type of white blood cell. They are a normal part of the immune system. When triggered by allergies, infection, or cancer, eosinophils increase in number and become active. In the short-term, this response is important and effective in ridding the body of intruders. However, high eosinophil numbers should not occur for long durations, as they can lead to chronic inflammation, resulting in tissue damage.

Over the past fifteen years, physicians have been diagnosing a rare condition of unknown cause, known as eosinophilic gastrointestinal disease (EGID), with increasing frequency in children and adults. EGID is characterized by chronic inflammation in the gastrointestinal (GI) tract caused by a higher than normal number of eosinophils without evidence of other causes (e.g., infections, cancer).

Physicians classify the disease according to the body tissue where the eosinophils accumulate. Each type of the disease requires long-term treatment. There is no cure for EGID.

- **Eosinophilic esophagitis (EoE)** is the most common type of EGID, where there are large numbers of eosinophils found in the esophagus. The esophagus is the tube that carries food from the mouth to the stomach.
- **Eosinophilic gastroenteritis (EG)** and eosinophilic enteritis (EE) affect the stomach and/or the small intestine.
- **Eosinophilic colitis (EC)** is the rarest form of the disease and describes the occurrence of high levels of eosinophils in the large intestine.

EGID can affect people of all ages and ethnic backgrounds, although there appear to be sex and genetic factors associated with the disease. Research has found that 75% of individuals with EoE are male and 70-80% have associated allergic disorders such as asthma, eczema, and seasonal and/or food allergies.

## Symptoms/Diagnosis

The symptoms vary for each person depending on the type of disease and can include difficulty swallowing, vomiting, reflux, abdominal and/or chest pain, as well as a failure to thrive in the case of young children.

Many individuals with EGID can unfortunately go for years without a proper diagnosis, as the symptoms are similar to other well-known GI diseases such as gastroesophageal reflux disease (GERD), Crohn's disease, ulcerative colitis, and celiac disease.

At present, the only way to diagnose EGID is through biopsies from an endoscopy and/or colonoscopy. During an endoscopy, a physician inserts a flexible tube with a light and a tiny camera at the end (an endoscope) through the mouth and examines the esophagus, stomach, and first part of the small intestine. For a colonoscopy, a physician uses a long, flexible tube (a colonoscope) inserted via the anus to view inside the colon. For a biopsy, the physician cuts out a tiny piece of tissue for examination under a microscope. A pathologist reviewing biopsy samples will look for large numbers of eosinophils leading to injury, inflammation, and thickening of tissue throughout the digestive tract.

## Treatment

Treatment will vary depending on the part of the GI system affected, but typically includes medication and adjustments to diet after a comprehensive assessment to identify possible food or environmental allergies.

## Dietary Therapy

Dietary therapy is frequently the first-line of treatment, given that individuals with EGID often have high rates of food

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allergies, and those allergies may be contributing to a high accumulation of eosinophils.

A range of dietary therapy options is available depending on the individual:

- targeted elimination diet that requires all ‘positive’ foods from allergy testing to be removed from the diet,
- six-food elimination diet in which patients eliminate the top 6 most allergenic foods (dairy, eggs, wheat, soy, peanuts/ other nuts, fish/shellfish) from their diet instead of basing dietary elimination on results from allergy testing,
- four-food elimination diet, a less restrictive variant in which patients eliminate dairy, eggs, wheat and soy, and
- elemental diets are the most restrictive option in which all sources of protein are removed from the diet. The patients receive their nutrition from an amino acid formula removing all other food from their diet. Some individuals may require a feeding tube, since many people do not like the taste of the formula.

Although a dietary approach may be appealing because it potentially offers an effective treatment without medication, there are important factors, including financial, that both patients and families need to consider. Being unable to afford to see a dietitian, or having to pay for the elemental diet formula can be financially difficult.

The average hourly charge for nutrition counselling services in Canada is \$106. This can quickly become a huge cost to individuals who need ongoing advice. As the number of individuals with this disease continues to increase, it will be important to address the access issues to publicly-funded dietitian support to ensure patients are receiving adequate nutrition. Provincial governments should also reconsider their eligibility criteria for public coverage of elemental diet formula. For example, individuals living in Ontario aren’t eligible for coverage if they are able to tolerate some solid food.

## Medication

There is currently no medication specifically approved by Health Canada for this disease. However, certain medications can reduce the number of eosinophils and improve symptoms.

Oral steroids, such as prednisone can successfully reduce the eosinophils. However, there are concerns with this type of medication being absorbed into the blood stream and associated with widespread side effects.

Inhaled (topical) steroids, which are widely used to treat asthma, can also be used to treat EGID, but patients take the medication orally instead of through inhalation. Different forms of topical steroids are available. Consensus guidelines published in 2011 for EoE recommend both fluticasone (Flovent®) and

budesonide (Pulmicort®). Patients administer fluticasone via a metered-dose inhaler, by puffing the medication into the mouth and then swallowing. Those using budesonide open a small, sealed container (ampoule) of the drug and typically mix it with multiple packages of a sugar substitute such as Splenda® and then swallow it. Recently, there was a study published to address concerns with giving high doses of artificial sweetener to children. The study determined that mixing budesonide with Neocate Nutra, a hypoallergenic nutritional supplement, is at least as effective as budesonide mixed with Splenda® at treating children with EoE.

Other medications that have been less studied, such as anti-histamines (e.g., ketotifen), which are used frequently for conditions such as hay fever, asthma, and eczema, have also been used to help relieve the symptoms of EGID by stopping the body from reacting to allergens

Whether an individual is able to control the disease through diet and/or medication, it is important to note that symptoms frequently return when treatment is discontinued.

## Management/Prognosis

Ongoing care for patients with EGID is required, including the likelihood of additional endoscopies to assess how the digestive tract is responding to specific treatment. Untreated EGID may lead to malnutrition, poor growth, and anemia. In some patients, EoE is complicated by the development of narrowing in the esophagus (strictures) that can cause issues with swallowing and choking. It is not clear how long EoE has to exist before strictures form. Strictures may need to be treated with endoscopy procedures to stretch the narrowing (dilation).

The long-term prognosis is unclear and there is much work required to find a cure, including plenty of research. We need Canadian guidance and recommendations regarding uniform diagnostic and therapeutic algorithms both in children and in adults, because every gastroenterologist should be competent in managing this condition.

