

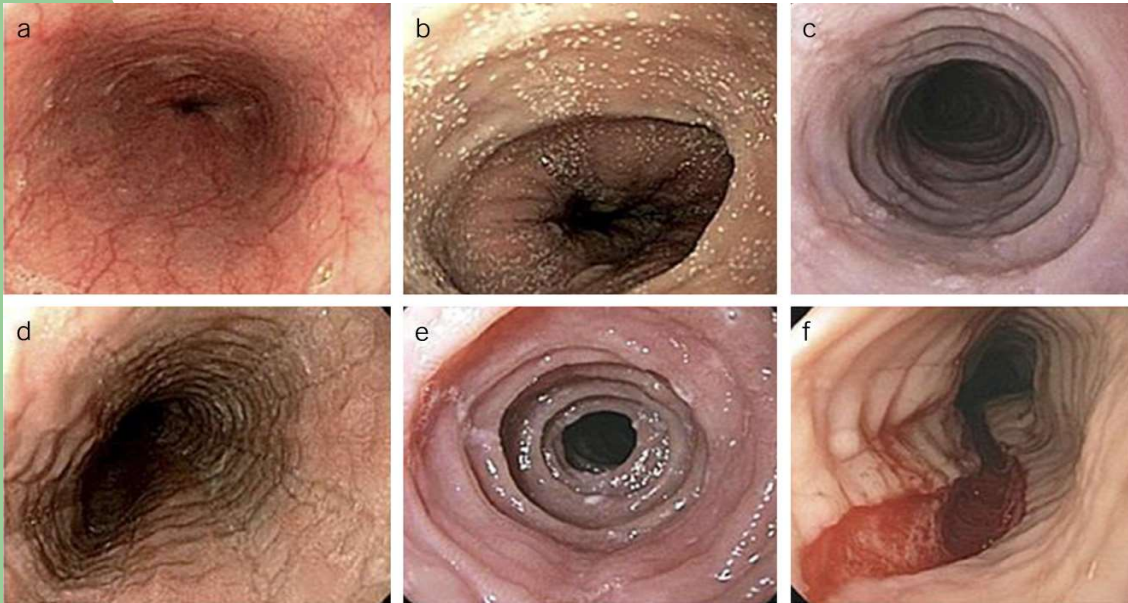
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Student scientific community (24.01.2023)

# Eosinophilic Esophagitis



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# Overview

- What is Eosinophilic Esophagitis
- Epidemiology
- Symptoms and signs
- Causes of EoE
- Risk Factors
- Complications
- Diagnostic methods
- Treatment

# What is Eosinophilic Esophagitis

- Eosinophilic esophagitis (EoE) is an inflammatory condition of the esophagus caused by an immune response to allergen exposure.
- In this condition the esophagus does not contract properly. It can get narrowed and develop rings or abscesses.
- EoE is chronic digestive disorders in which there is increased number of eosinophils in the esophagus

# Epidemiology

- Almost all new studies for this disorder shows that the incidence and prevalence of EoE are increasing, so EoE has transformed from a rare case-reportable condition to disease that is commonly encountered in the gastroenterology clinic
- Current incidence estimates range from 5 to 10 cases per 100,000
- Diagnosed in more than 11% of people evaluated for swallowing problems (compared to less than 2% before 10 years ago)
- Most common in children and young adults
- Affected all ages and both sexes but its common in male than female

# Symptoms and signs

- Symptoms of EoE vary from person to person
- The symptoms frequently the same as GERD
- Its caused by inflammation and swelling in the esophagus and include

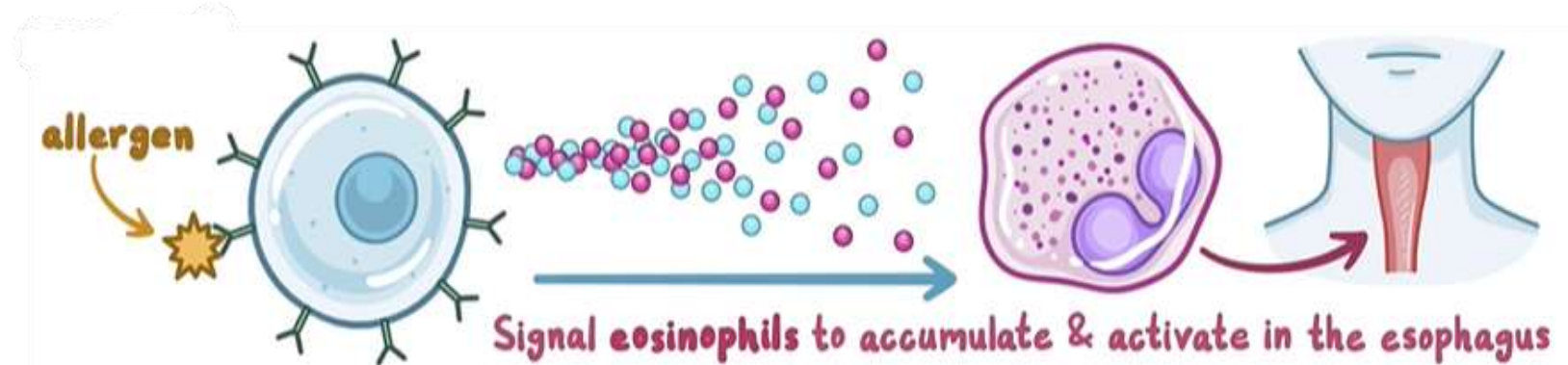


# Causes of EoE

EoE is caused by an allergic reaction to certain foods, or environmental allergens, or changes to the expression of certain genes.

# The hypersensitivity reactions

- The hypersensitivity reactions involved are a form of allergic reaction after exposure to a food or environmental allergen

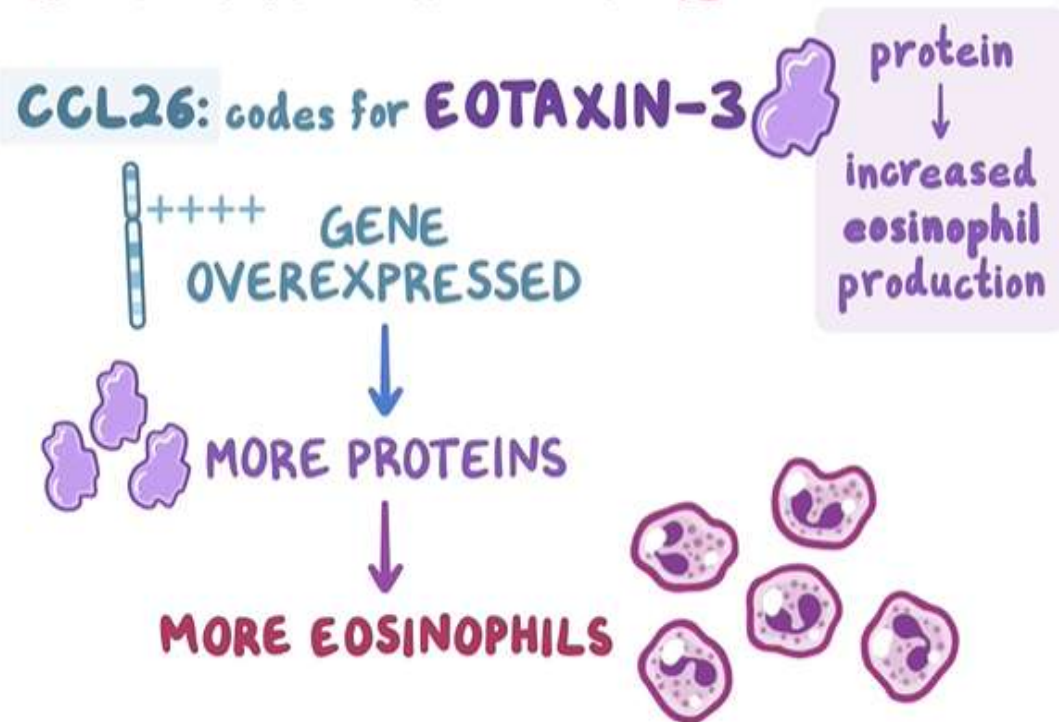


\* 1st EXPOSURE = DELAYED RESPONSE

\* MORE EXPOSURE = MORE C

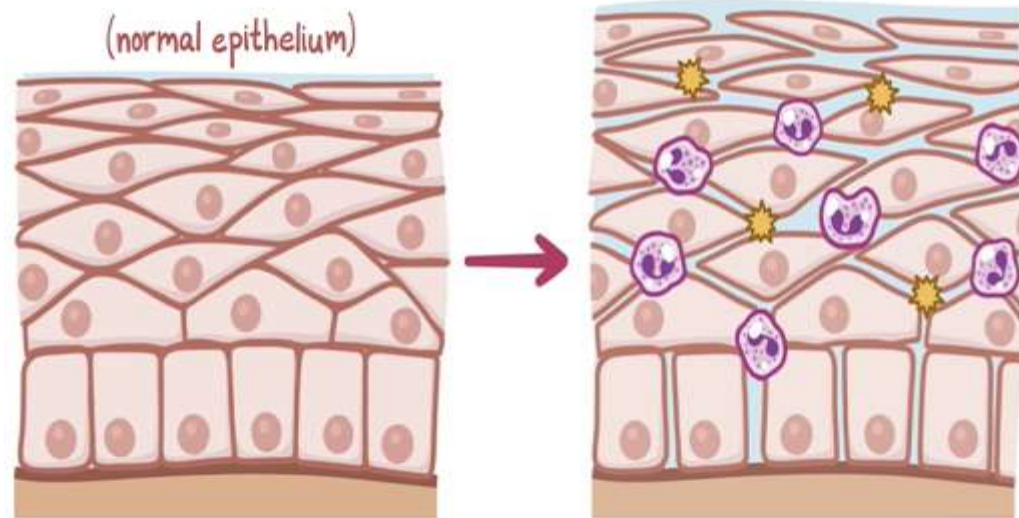
# Changes to the expression of certain genes

- changes to gene expression appear to play a role in increasing the number of eosinophils in a person with EoE.  
A primary gene involved in people with EoE is CCL26 which encodes for eotaxin-3

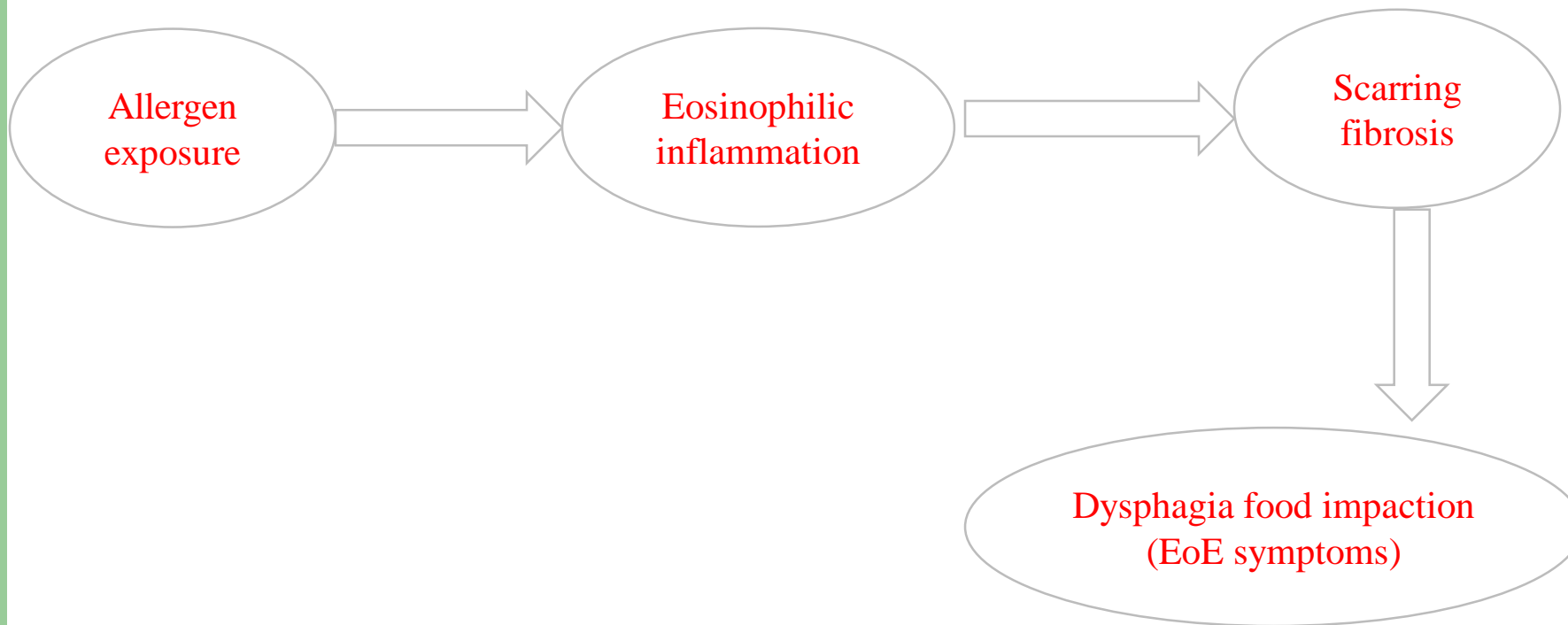




- Some other genes that are associated with EoE, such as CAPN14
- CAPN14 overexpression impairs epithelial barrier function, as demonstrated by decreased transepithelial resistance, increased FITC-dextran flux and increased dilated intercellular spaces
- All of these allowing increased ability for allergens and inflammatory cells, like eosinophils, to enter the esophagus, leading to the development of eosinophilic esophagitis.



# How does it happen?



# Risk Factors

- There are many environmental factors that can increase the risk of developing EoE along with genetic factors for the disorder.
- 1- Environmental factors includes:
  - environmental allergies to substances such as pollens, animals, dust mites and molds possibly play a role in EoE
  - climate: people who live in a cold or dry climate are more likely than those in other climates
  - season: individuals more likely to be diagnosed between the spring and fall, because levels of pollen and other allergens are higher and people are more likely to be outdoors.
- 2- genetic factors demonstrated by twin studies which show a high rate of EoE in both twins.

If your family members have eosinophilic esophagitis, you have a greater chance of being diagnosed.

- Others risk factors include:  
autoimmune conditions such as, inflammatory bowel disease ,  
rheumatoid arthritis and celiac disease are at higher risk of developing  
EoE as well.
- Sex: Eosinophilic esophagitis is more common in males than in  
females.
- Food allergens which directly attributed to the disease.

# Complications

- eosinophilic esophagitis can lead to the following:
  - 1- Scarring and narrowing of the esophagus. This makes it difficult to swallow and more likely that you will have food get stuck.
  - 2- Damage to the esophagus. Because of inflammation of the esophagus, endoscopy can cause perforation or tears in the tissue that lines the esophagus.

# Diagnostic methods

- The diagnosis of EoE is typically made on the combination of symptoms and findings on diagnostic testing so doctor will consider both your symptoms and test results to diagnose eosinophilic esophagitis
- The diagnoses of EoE include:
  - 1- Endoscopy
  - 2- Taking biopsy
  - 3- Allergy assessment that include : Prick Skin Testing, Blood Tests and Food Patch Tests
  - 4- Esophageal sponge

# Diagnostic criteria

**TABLE 1** Criteria for diagnosis of eosinophilic esophagitis

Clinical	Must have symptoms related to esophageal dysfunction.
Histopathologic	One or more biopsies must show eosinophilic-predominant inflammation with >15 eos/hpf. Inflammation must be confined to esophagus. Other causes of esophageal eosinophilia must be excluded.
Treatment response	Eosinophilia does not resolve with acid-suppression therapy. Inflammation should remit with dietary exclusion and/or topical corticosteroids.

Abbreviation: eos/hpf, eosinophils per high-power field.  
From Liacouras CA, et al.<sup>3</sup>

# Endoscopy

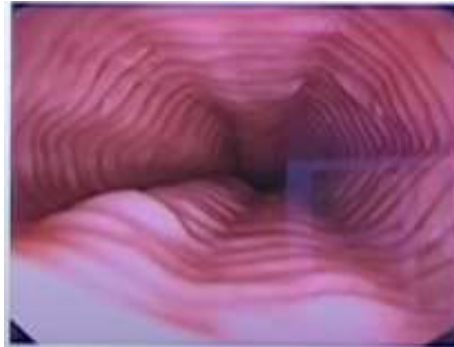
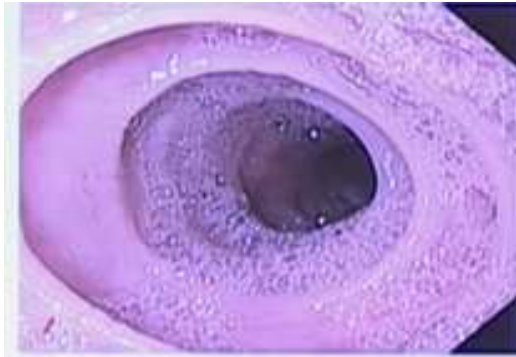
- An endoscopy is a medical procedure where a flexible tube containing a light source and a camera lens is passed down the esophagus so your doctor can see if your esophagus is inflamed. The lining of esophagus will be inspected for inflammation and swelling, horizontal rings, vertical furrows, narrowing (strictures), and white spots.

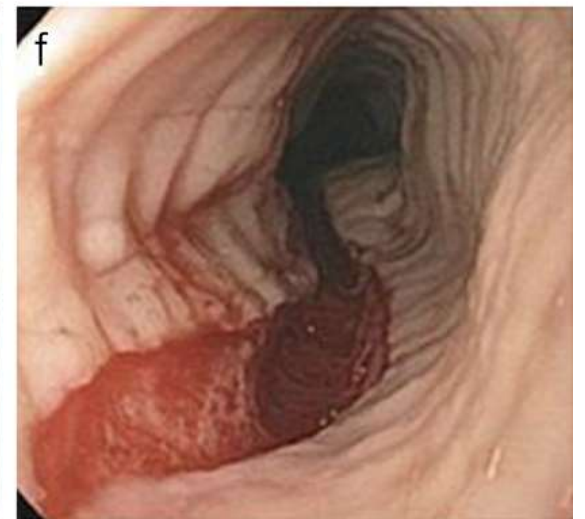
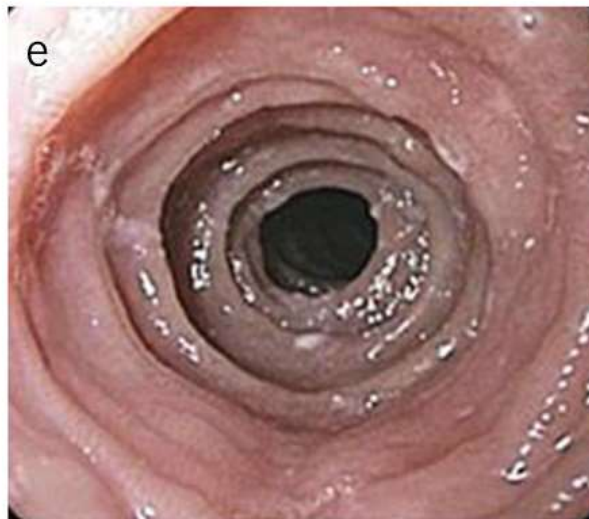
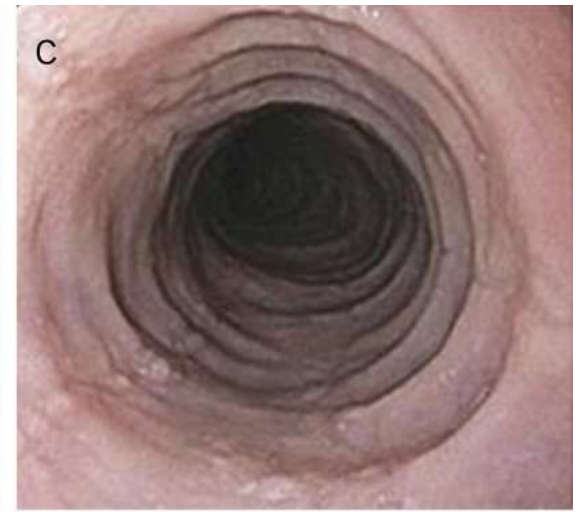
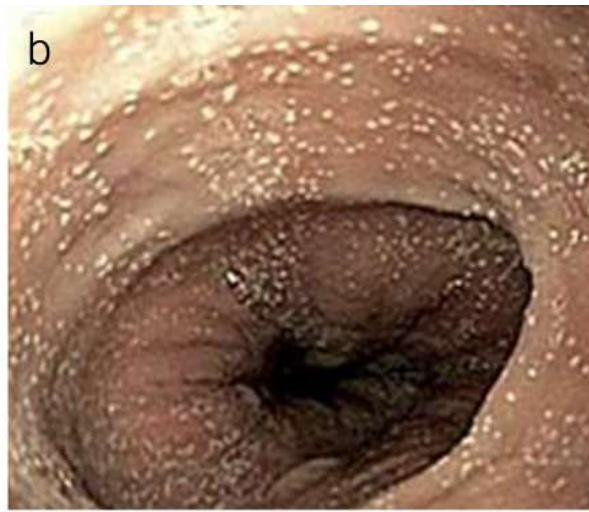




# Endoscopic findings

- Rings
- Linear furrows
- Felinization
- Structure





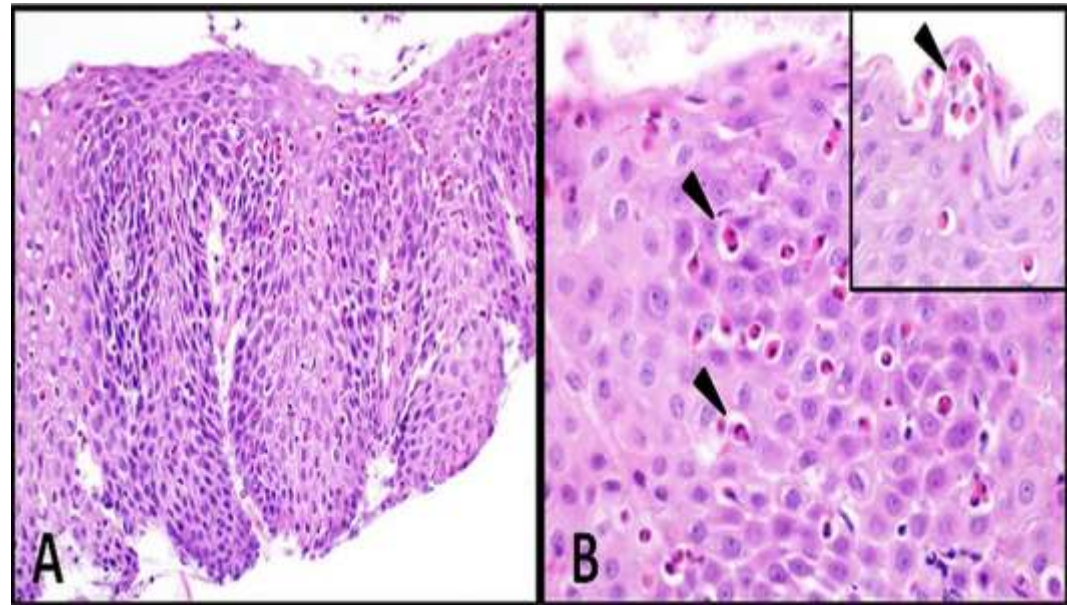
EoE endoscopic features.

(a) Normal esophagus, (b) white pinpoint exudate,

(c) concentric rings and linear furrows, (d) linear furrows, (e) concentric rings, and (f) longitudinal tear.

# Biopsy

- Endoscopic mucosal biopsy remains the most important diagnostic test for EoE, and is required to confirm the diagnosis.
- Biopsy specimens from both the proximal/mid and distal esophagus should be obtained at least 2 or 3 biopsies each from upper and lower esophagus.
- A definitive diagnosis of EoE is based on the presence of at least 15 eosinophils per section under microscope at high-level magnification.



# Allergy assessment

- The majority of patients with EoE are atopic. An atopic person is someone who has symptoms of one or more allergic disorders. These include asthma, allergic rhinitis, atopic dermatitis (eczema) and food allergy. EoE has occasionally been shown to occur in other family members.
- Testing for allergic sensitization may be considered using skin prick testing or blood testing for allergen-specific IgE.

# Prick Skin Testing

- Prick skin testing involves using a prick device to introduce a small amount of allergen into the skin by making a small puncture.
- Food extracts for skin prick testing are prepared fresh in the allergist's office from foods supplied by the family.
- Patients with allergies make an allergy antibody called IgE. When patients with IgE for a particular allergen have tiny amounts of that allergen put into their skin (prick skin test), an area of swelling and redness forms within about 15 minutes at the site where the skin prick test was done.



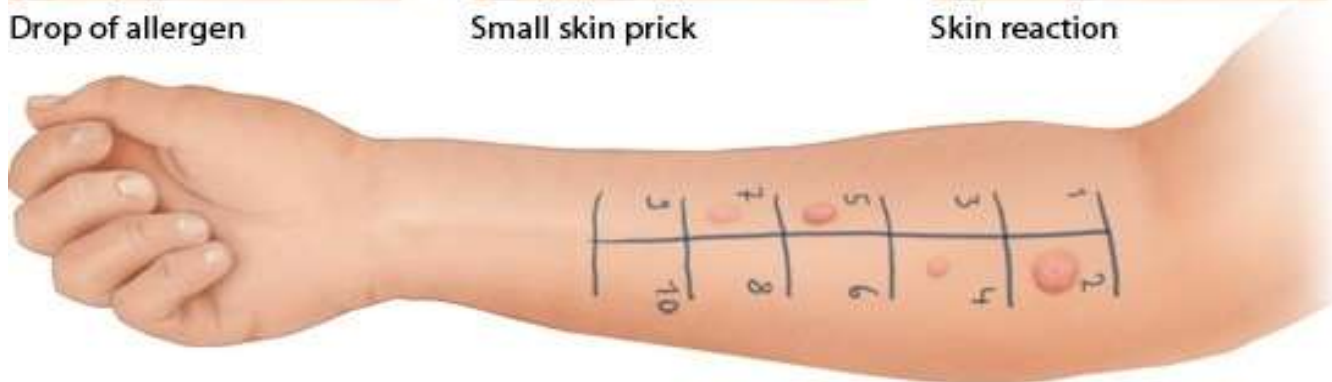
Drop of allergen



Small skin prick



Skin reaction



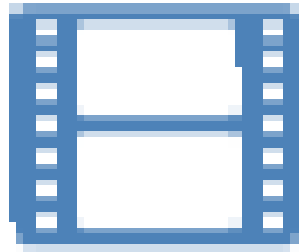
# Blood Tests

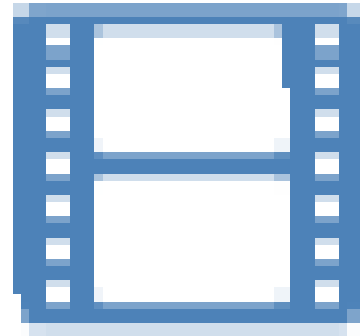
- Doctors may do a blood test (called a serum specific immune assay) to see if you are sensitized to a specific allergen.  
This test detects IgE circulating in the blood stream directed against an allergen and can be helpful in certain conditions linked to IgE-mediated food allergies.
- Complete blood count with differential to determine the presence of peripheral blood eosinophilia (absolute eosinophil count  $>300\text{-}350/\text{mm}^3$ ), which is seen in 40% to 50% of patients.
- Serum IgE may be elevated ( $>114\text{ kU/L}$ ) but may reflect the presence of other allergic diatheses such as atopic dermatitis.

- Finally, It is important to understand that skin prick tests, allergy blood tests can have false positive tests. This means that these tests may suggest you are sensitized to a food that you can tolerate and does not cause your EoE. They can also have false negative results, meaning that the test is negative to a food that is actually causing EoE.
- To know if these foods causing EoE or not doctor will use type of treatment called Elimination diets, where foods suspected of causing EoE are removed from the diet, and then doctor will see if there is a reduction in EoE symptoms or not



# Esophageal sponge





# Differential diagnosis

- EoE must be excluded from diseases include GERD, infection, autoimmune disease and inflammatory bowel disease Differentiating EoE from GERD may be difficult because both may present with similar symptoms.
- GERD more typically involves the distal esophagus, whereas EE occurs more diffusely throughout the esophagus.
- In addition, GERD may be excluded by lack of response to acid suppression (6–8 week course high-dose PPI), or by demonstration of normal pH monitoring study of the distal esophagus.
- Esophageal inflammation in EE may enhance esophageal sensitivity to physiologic acid exposure.

# Treatment

- Eosinophilic esophagitis is considered a chronic relapsing disease, meaning that most people will require ongoing treatment to control their symptoms. Treatment will involve one or more of the following:
  - 1-Proton pump inhibitor (PPI)
  - 2-Topical steroid
  - 3-Dietary elimination
  - 4-Esophageal dilation

# Proton pump inhibitor (PPI)

- The first recommended treatment is proton pump inhibitors (PPI)
- Its acid suppression (acid blockers)
- May have anti-inflammatory properties
- 33-50% of patients with EoE feature respond
- Twice a day dosing up to 8 weeks to see if PPI-REE

## PPIs<sup>a</sup>

Young children:

- Omeprazole 1 mg/kg twice daily

Adolescents and adults:

- Omeprazole 20 mg twice daily
- Lansoprazole 30 mg twice daily
- Esomeprazole 40 mg twice daily
- Pantoprazole 40 mg twice daily
- Rabeprazole 20 mg twice daily

# Topical swallowed steroids

- Overall histologic response rate -65%
- MDI (metered dose inhaler) form  
Fluticasone 220mcg/puff → 2 puffs BID  
Beclomethasone 80mcg/puff → 2 puffs BID
- Oral viscous budesonide (1mg respule)  
Typically mix with  
sucralose (5 packets) → BID  
Other media (e.g. applesauce, honey)  
can be used
- Similar rate, degree of histo  
improvement between forms



# Considerations with steroid treatment

- No eating/drinking for at least 30 minutes after medication
- Rinse mouth (swish, gargle, spit) to reduce thrush risk
- Treatment duration: 8-12 weeks
- If histologic/symptomatic response rate)  
Consider discontinuing (high relapse rate)  
Consider maintenance dosing

Oral candidiasis(Thrush)



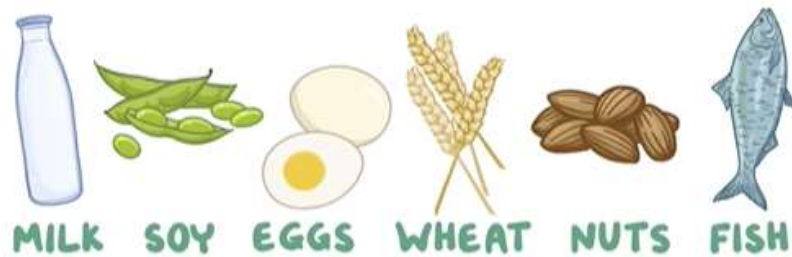


# Dietary elimination

- Elimination based on allergy testing.
- If you are noted to have specific food sensitivities after prick skin testing your doctor may remove specific foods from your diet to see if there is a reduction in EoE symptoms this help in some individuals but this type of diet has not shown to be very successful in research studies so its not common for dietary therapy.

# Empiric Elimination Diets(six foods Elimination)

- Eliminating the major food allergens from the diet is considered an acceptable first-line treatment of EoE.
- The foods excluded usually include:

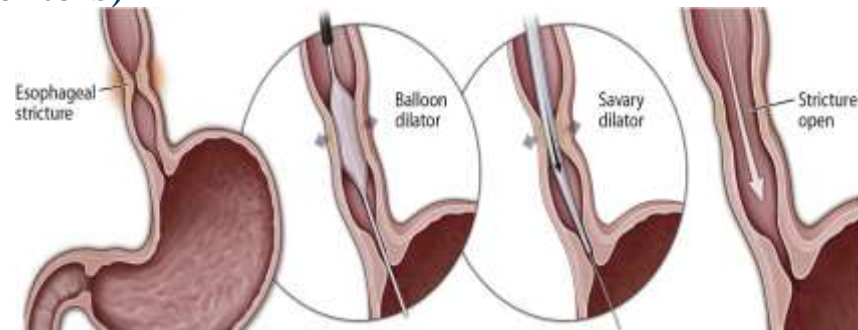


- These diets very helpful in treating EoE.
- They can be very difficult to follow so Foods are typically added back one at a time with follow up endoscopies to help determine which specific foods are causing EoE.

- There are 3 options for this treatment :  
First one 6FED removes wheat, dairy, eggs, soy, all nuts, all fish/seafood.
- Second one 4FED removes wheat, dairy, eggs, soy.
- Third one 2FED removes wheat, dairy.

# Esophageal dilation

- Useful for treating very light strictures
- Can be done in absence of prior medical therapy
- Provides immediate symptom improvement
- Does not treat the underlying inflammation
- Goal diameter 15-18mm (might need multiple sessions)
- Risks:
  - Chest pain (75%) - usually resolves within 2-3 days
  - Clinically significant bleeding( less than 1%) very rare
  - Perforation (0.3% in academic medical centers)





**THANK YOU  
FOR YOUR  
ATTENTION**