Eosinophilic Esophagitis

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Learning Objectives

- To define Eosinophilic Esophagitis (EoE) and present the updated 2011 diagnostic guidelines.
- To understand the epidemiology, pathophysiology and genetics of EoE.
- To identify the clinical symptoms, allergic manifestations, endoscopic and histologic features of EoE.
- To list and define the treatments of EoE which include dietary restriction, pharmacologic therapy and esophageal dilation.
- To understand how to manage patients with EoE.
- To provide information regarding ongoing and future research on EoE.

Have you seen this?

- 3 yo with poor weight gain and feeding difficulty
- 5 yo with intermittent vomiting and epigastric pain
- 8 yo with frequent regurgitation and heartburn that recurs after stopping a PPI
- 12 year old with complaints of “difficulty swallowing”
- 15 year with an “emergent” esophageal food impaction requiring immediate removal
- 28 year old with chronic heartburn and nausea
- 36 year old requiring emergent endoscopy for an esophageal food impaction

Background & Natural History

Background

- Rare cases suggestive of eosinophilic esophagitis (EoE) were described in the 1970's
- Began to be described in early 1990's
- Appreciated as a distinct entity in early 1990's

Kelly et al. *Gastroenterology.* 1995; 109:1503-1512.
Straumann et al. *Schweiz Med Wochenschr*. 1994 20;124(33):1419-29.
Attwood et al. *Dig Dis Sci.* 1993; 38(1):109-16.

Landmark article

Eosinophilic Esophagitis Attributed to Gastroesophageal Reflux: Improvement With an Amino Acid–Based Formula

KEVIN J. KELLY,*,† AUDREY J. LAZENBY,§ PETER C. ROWE,* JOHN H. YARDLEY,‖ JAY A. PERMAN,*,† and HUGH A. SAMPSON*,¶

Divisions of †Pediatric Gastroenterology/Nutrition and ¶Pediatric Allergy/Immunology and Departments of *Pediatrics and ‖Pathology, The Johns Hopkins University School of Medicine, Baltimore, Maryland; and §Department of Pathology, University of Alabama at Birmingham, Birmingham, Alabama

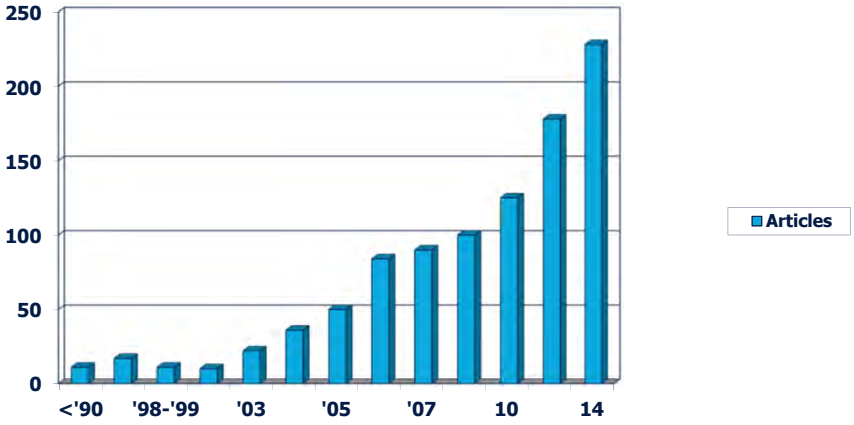
Background

- Initially described as EE, now EoE, several pediatric gastroenterologists (1 adult GI from Europe) first subsequently demonstrated that EoE responded not only to diet restriction but also to prednisone and swallowed topical steroids
- Initially, unclear if EE was part of the spectrum of eosinophilic gastroenteritis
- Allergists became involved, interested in etiology, pathogenesis and treatment of disease
- Adult GI's in US began seeing increased food impactions & similar endoscopic findings in early to mid 2000's

1995 Distribution of EoE

2013 Distribution of EoE

Increase in EoE journal articles

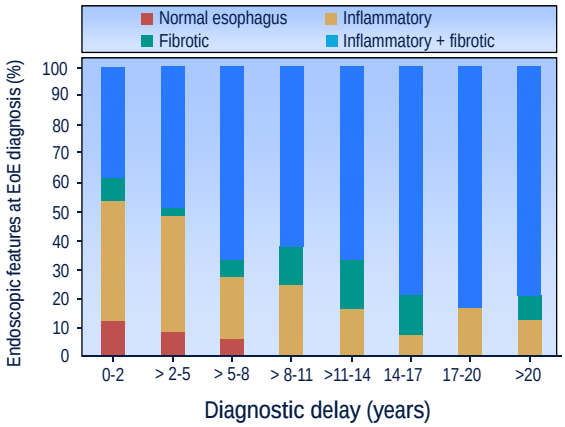


Natural History

- In a prospective case series of 30 adults with EoE (followed for a mean of 7.2 years)
  - 29/30 persistent dysphagia
  - Biopsies and dilation performed
  - Deeper biopsy tissue was available in 7, and 6 exhibited evidence of fibrosis in the lamina propria
  - Although variable in number, all had a persistent, severe esophageal eosinophilia

Straumann et al. *Gastroenterology.* 2003; 125:1660-1669.

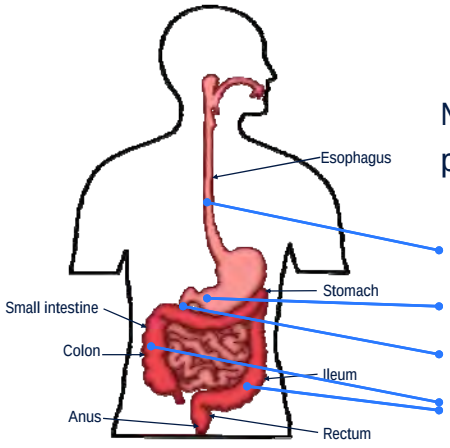
Natural History – Adult Study



Schoepfer et al. *Gastroenterol.* 2013:145;1230-6.

Definition

Gastrointestinal Eosinophils



Normal eosinophil values, per high power field (hpf):

- Esophagus (0)
- Gastric antrum (2-10)
- Duodenum (10-20)
- Colon (15-30)

Average accepted values

DeBrosse CW et.al. *Pediatr Dev Pathol*. 2006;9(3):210-8.

Esophageal Eosinophilia

Differential Diagnosis

- Eosinophilic Esophagitis
- Gastroesophageal Reflux Disease
- PPI-responsive esophageal eosinophilia
- Celiac Disease
- Eosinophilic gastroenteritis
- Crohn's Disease
- Hypereosinophilic syndrome
- Achalasia
- Vasculitis, pemphigus, connective tissue disease
- Infection
- GVHD

Esophageal Eosinophilia is not Eosinophilic Esophagitis

2007 Consensus Recommendations Facts

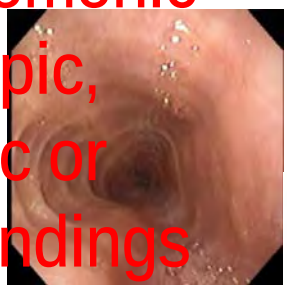
- Clinical symptoms: symptoms related to GERD, dysphagia or feeding problems and poor weight gain in children and dysphagia in adults
- Natural history: Chronic disease, esophageal strictures and small caliber esophagus main morbidity
- Epidemiology: males > females; familial clustering; studies demonstrating genetic association; 1:10,000 incidence but increasing prevalence
- Allergist: essential because of association with asthma, allergic rhinitis, eczema and other food allergies

Straumann A. Gastro;125:1660,2003
Noel R. NEJM;351:940,2004

2007 Consensus Recommendations Facts

No pathognomonic endoscopic, radiologic or histologic findings






2007 Consensus Recommendations

Clinico-pathologic diagnosis

- Presence of clinical symptoms related to esophageal dysfunction
  - Vomiting, abdominal pain, heartburn, dysphagia, reflux symptoms, feeding difficulty, etc.
- Isolated esophageal eosinophilia
  - > 15 eosinophils per 40X HPF
  - Histology of remainder of GI tract normal
- Exclusion of other GI disorders
  - Absence of pathologic GERD
    - Lack of response to PPI therapy or normal pH probe
  - Infection, Crohn's disease, hypereosinophilic syndrome

Furuta et al. *Gastroenterology.* 2007; 133:1342-63.

2007 Consensus Recommendations Definition of EE

Clinico-pathologic diagnosis

- Presence of clinical symptoms related to esophageal dysfunction
  - Vomiting, abdominal pain, heartburn, dysphagia, reflux symptoms, feeding difficulty, etc.
- Isolated esophageal eosinophilia
  - ≥ 15 eosinophils per 40X HPF
  - Histology of remainder of GI tract normal
- Exclude other causes of esophageal eosinophilia
  - GERD
  - Exclude infection, crohn's disease, hypereosinophilic syndrome

Need both clinical & pathologic information for proper diagnosis

Use of PPI's help to exclude other likely disorders

Furuta et al. *Gastroenterology.* 2007; 133:1342-63.

2007 -2011

- Scientific publications on EoE doubled
- However .....

CLINICAL REVIEW

Variability in Diagnostic Criteria for Eosinophilic Esophagitis: A Systematic Review

Evan S. Dellon, M.D.,[1,2] Ademola Aderoju, M.D.,[2] John T. Woosley, M.D., Ph.D.,[3] Robert S. Sandler, M.D., M.P.H.,[2] and Nicholas J. Shaheen, M.D., M.P.H.[1,2]

Dellon et al. *Am J Gastroenterol.* 2009;(102)*:2300-2313.*

2011 Consensus Recommendations

- Panel of 33 physicians
- Conceptual Definition
  - *"Eosinophilic esophagitis represents a chronic, immune/antigen mediated, esophageal disease characterized clinically by symptoms related to esophageal dysfunction and histologically by eosinophil-predominant inflammation"*
- Pediatric and adult EoE very similar disease processes
  - Only difference was clinical presentation

Food Antigens Primary Cause of EoE

Liacouras et al. *J Allergy Clin Immunol.* 2011; 128:3–20.

2011 Consensus Recommendations Guideline

Diagnostic Guideline (similar to 2007)

- New term "EoE"
- EoE is a clinico-pathologic disease
- Clinically characterized by esophageal dysfunction
- Pathologically 1 or more biopsies show eosinophil predominant inflammation (15+ eosinophils in peak hpf)
- Isolated to esophagus (need for other GI biopsies)
- Other causes need to be excluded
  - Distinguish between "EoE" and "esophageal eosinophilia"
  - "PPI responsive esophageal eosinophilia"
- EoE diagnosis made by clinicians

EoE Requires a Clinico-Pathologic Diagnosis

EoE and PPI-REE should be identified as may be distinct entity

Liacouras et al. *J Allergy Clin Immunol.* 2011; 128:3–20.

PPI-Responsive Esophageal Eosinophilia

PPI-responsive esophageal eosinophilia (PPI-REE)

	Patient 1	Patient 2	Patient 3
Age (yr)/sex	14/M	25/M	13/F
Presentation	Pain	Food impaction	Dysphagia
Environmental Allergies	Yes	Yes	No
Treatment	Omeprazole 10 mg BID	Omeprazole 20 mg BID	Omeprazole 20 mg QD
Eosinophils/HPF			
Before treatment	37	21	59
After treatment	1	3	0

Many other publications since 2006 have corroborated results

Ngo, et al. *Am J Gastroenterol* 2006;101:1666–1670.

PPI-REE – Estimates

Author	Year	Population	Design	# of patients with eosino-philia treated with PPI	PPI-REE (n, %)
Dranove	2009	Peds	Retro.	43	17 (40)
Sayej	2009	Peds	Retro.	36	14 (39)
Molina-Infante	2011	Adult	Prospective	35	26 (74)
Peterson	2010	Adult	RCT*	12	4 (33)
Moawad	2011	Adult	RCT*	20	7 (35)
Dellon	2013	Adult	Prospective	65	24 (37)
Schroeder	2013	Peds	Retro.	7	5 (71)

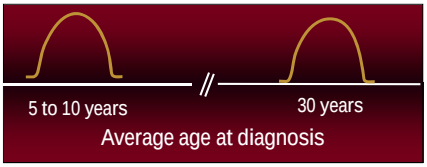
Dohil et al. *Dig Dis Sci*. 2012:1413-9.

PPI-Responsive Esophageal Eosinophilia

- PPI-REE currently considered to be “distinct” from EoE
- Etiology
  - Is it due to gastroesophageal reflux responsive to acid suppression?
  - Is it a possible new anti-inflammatory effect of PPI’s?
  - Is it a subset of EoE?
  - Is it a combination of the above?
- Further research needed

Epidemiology of Eosinophilic Esophagitis

Age of Onset of EoE

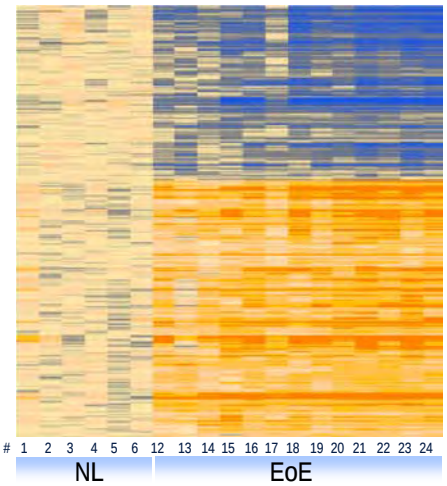


Early 2000's incidence of 10 in 100,000
Last 5 years incidence reported to have increased to 20-40 in 100,000
Prevalence continuing to increase - approaching 90-100 in 100,000

Liacouras CA et al. Clin Gastroenterol Hepatol. 2005;12:1198-206
Straumann et al. *Gastroenterology.* 2003; 125:1660-1669.
Croese et al. *Gastrointest Endosc.* 2003; 58:516-522.

Genetics

Gene Expression Profile of EoE



230 Genes
Downregulated

344 Genes
Upregulated

EoE patients have a unique gene expression profile

Blanchard et al. *J Clin Invest.* 2006; 116(2):536-547.

EoE - Genetics

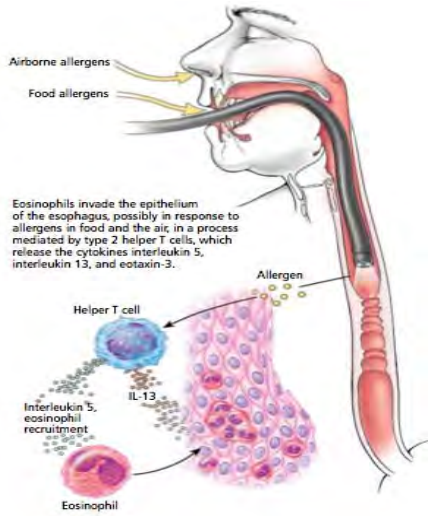
- Increased incidence in siblings and 1st degree relatives
- Identified gene locus at chromosome 5q22
- TSLP gene (Thymic Stromal Lymphopoetin Protein)

Rothenberg et al. *Nat Genet*. 2010; 42:289-10.

Pathophysiology of EoE

Probable Pathophysiology of EoE

- Intraluminal allergen exposure
  - Food >>>> Aeroallergens
- Cell mediated disease (not IgE)
- Systemic etiology - not topical
- Leads to mucosal production of eosinophilic chemo-attractants
- Influx of eosinophils
- Release of inflammatory mediators
- Esophageal dysfunction



Noneveski et al; *Clev Clin J.* 2008:75(9):623-633.

Cells & Cytokines Related to EoE

- Esophageal eosinophils – primary identifier
  - An expansion of Th2 lymphocytes
  - Esophageal mast cells
  - Esophageal basophils
- Cytokines
  - IL-5 and Eotaxin - primary
  - IL-4, IL-13, TSLP, TGFβ and pSMAD

Is EoE an IgE mediated Disease?

- In murine models, IgE knockout mice had no effect on disease
- SPT/Immunocap and Microarray do not work well (<15%)
- Omalizumab does not work
- Few studies with oral immunotherapy may in fact induce EoE (egg, dairy, nut)
- Recent studies identifying IgG4
  - Increased granular deposits of IgG4
  - Increased IgG4 plasma cells
  - Increased serum IgG4 to specific food antigens

NO Cell Mediated

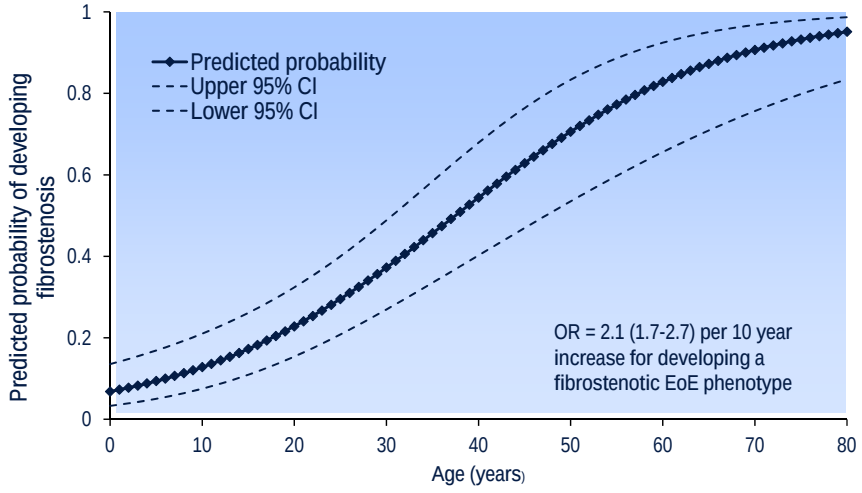
Fibrosis

Esophageal Fibrosis

- Occurs in animal models
  - In response to allergen challenge
- Occurs in pediatric and adult patients
  - With dysphagia, esophageal rings, strictures
- Components of EoE remodeling
  - Fibrosis, Collagen deposition, Pro-fibrotic factors, Pro-fibrotic signaling molecules, Angiogenesis, Vascular activation

Straumann et al. *Gastroenterol.* 2003; 125(6):1660-1669.
Parfitt et al. *Mod Pathol.* 2006; 19:90-96.
Mishra et al. *Gastroenterology.* 2008; 134(1):204-214.
Chehade et al, *J Pediatr Gastroenterol Nutr.* 2007; 45(3):354-357.
Aceves et al. *J Allergy Clin Immunol.* 2007; 119(1):206-2012.

EoE as a Progressive Disease



Dellon et al. *Gastrointest Endosc.* 2013.

EoE and Atopy

Prevalence of Atopic Disease in EoE

- 50-60% of EoE patients have one or more of the following:
  - Asthma
  - Allergic rhinitis
  - Atopic dermatitis
  - Other IgE mediated food allergies

Prevalence of Atopy

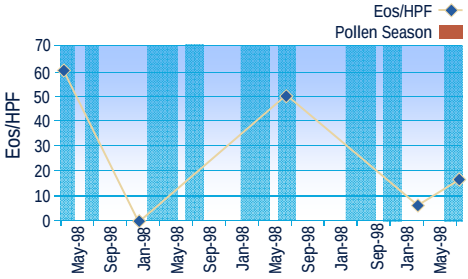
Author/population	Number of patients with EoE	Asthma	Allergic Rhinitis	Atopic Dermatitis
Atopy in the General Population		8.5%	25%	10%
Spergel, et al; Philadelphia	620	50%	61%	21%
Assa'ad, et al; Cincinnati	89	39%	30%	19%
Sugnanam, et al; Australia	45	66%	93%	55%
Guajardo, et al; World Wide Registry	39	38%	64%	26%

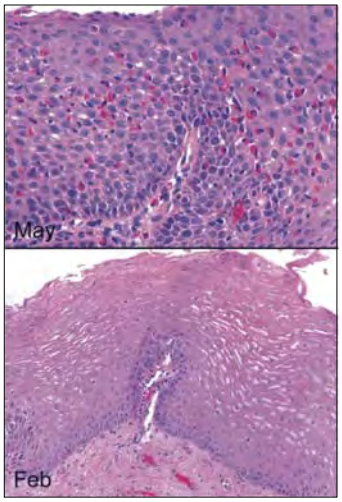
Spergel et al. *J Pediatr Gastroenterol Nutr.* 2009; 48(1):30-36.
Sugnanam et al. *Allergy*. 2007; 62(11):1257-1260.
Guajardo et al. *J Pediatr.* 2002; 141:576-581.
Assa'ad et al. *J Allergy Clin Immunol*. 2007; 119:731-738.

Association with Environmental Allergies

Seasonal Variation in EoE

20 year old female, history of multi-sensitization to aeroallergens. Symptoms of allergy and EoE peaked during pollen season.





Fogg et al. *J Allergy Clin Immunol*. 2003; 112(4):796-797.

Allergic rhinitis and EoE

- Proximal esophageal eosinophils were found in
  - 0 control patients
  - 10 (26%) with allergic rhinitis
- Eosinophils per HPF
  - 9.5 ± 7.3 in allergic rhinitis patients
- Proximal esophagus only
- Resolved with use of nasal fluticasone

Liacouras et al, 2014 abstract

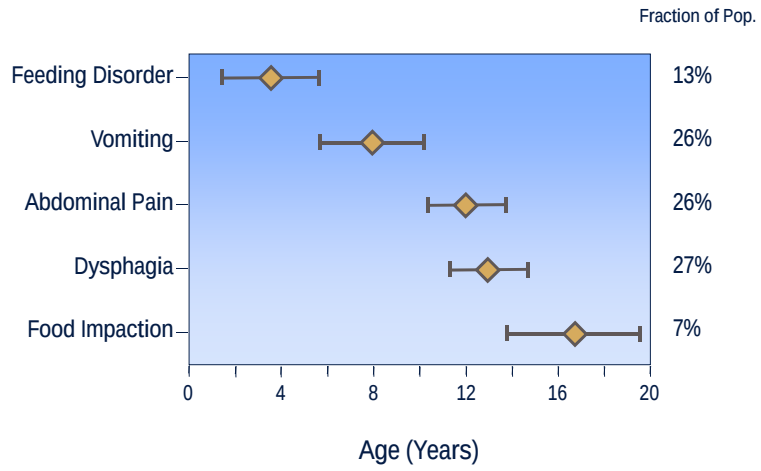
Pediatric Clinical Symptoms

Clinical Features

- Male predominance (about 3:1)
- Multiple reports of familial clustering (within and across generations)
- Association with food allergy and atopy
- Chronic condition in adults and children

Furuta et al. *Gastroenterology.* 2007; 133:1342-1363.

EoE Presentation by Age



Noel et al. *N Engl J Med.* 2004; 351:940-941.

Clinical Symptoms – Epigastric Pain

- Present in 5-68% of children
- Frequent, but not universal complaint
- May be chest pain or abdominal pain (epigastric or generalized)
- GERD-like symptoms in 5-82% of children
- Odynophagia is not typical
- May be responsive to acid suppression therapy

Clinical Symptoms - Vomiting

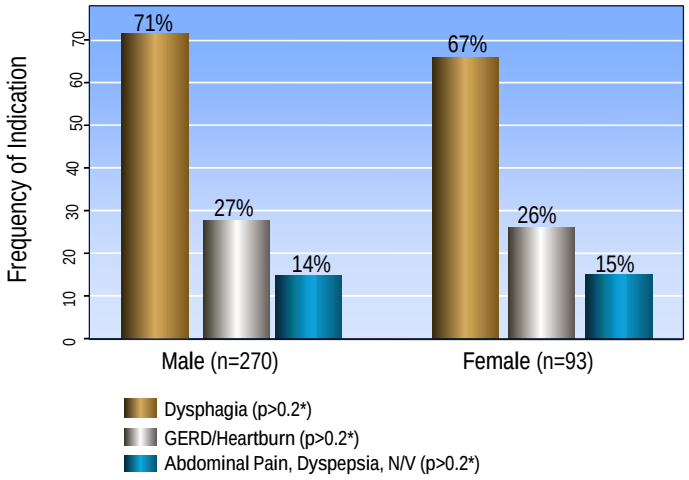
- Present in 8-100% of children with EoE
- Not clinically distinguishable from other causes of vomiting
- Symptom frequently misclassified as GERD and there is often a delay in diagnosis
- Typically true vomiting over effortless regurgitation
- Chronic, episodic and unpredictable
- May not occur immediately after food ingestion

Clinical Symptoms- Dysphagia

- The most common symptom of EoE in adults
- In children, dysphagia manifests in several ways:
  - Choking, gagging, food refusal
  - The sensation of food sticking or going down slowly
  - Food impaction
- Often difficult to obtain an accurate history in children
- Occurs even in the absence of esophageal stricture or small caliber esophagus

Adult Clinical Symptoms

Presenting Symptoms of EoE in Adults

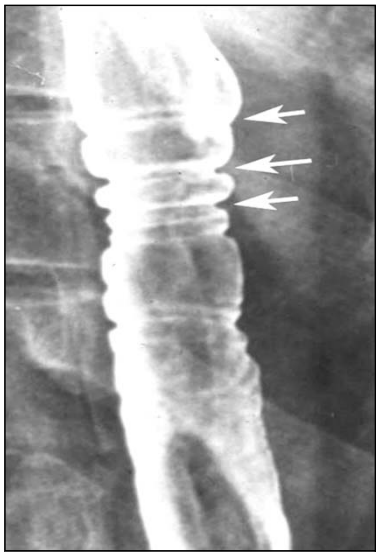


* P value for χ^2 comparing the proportion of males vs. females

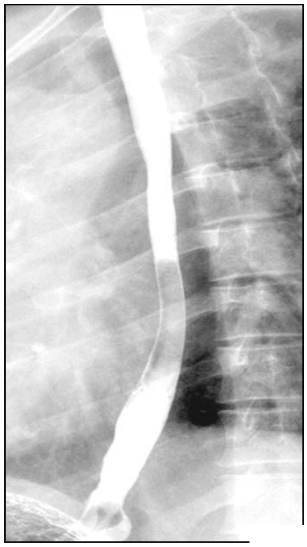
Kapel et al. *Gastroenterology.* 2008; 134:1316-1321.

Radiologic Findings

Esophageal Rings



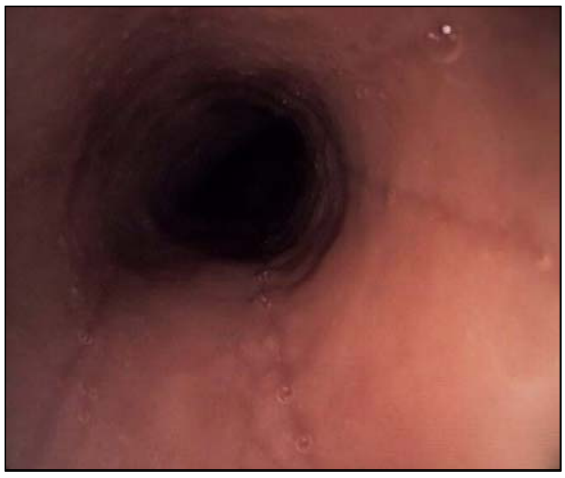
Small Caliber Esophagus



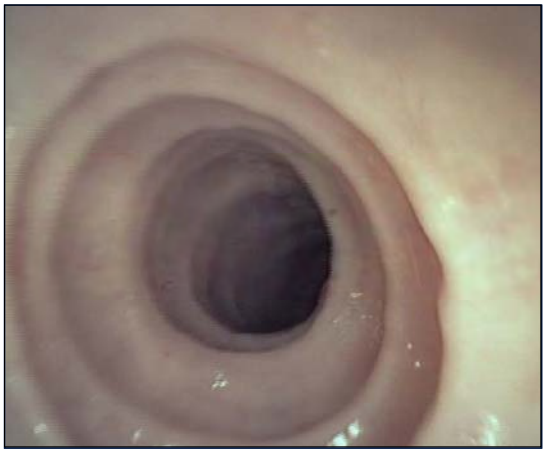
Endoscopic Findings

Normal Esophagus

Esophageal Furrowing

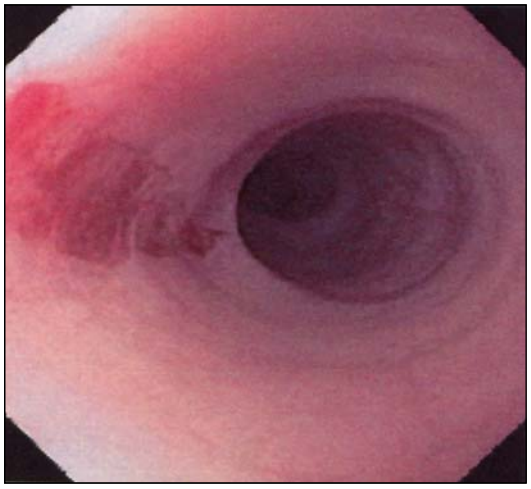


Esophageal Rings



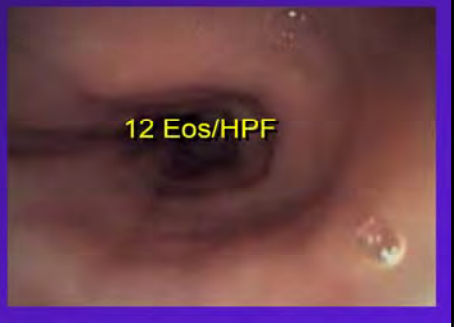
White Plaques

Small Caliber Esophagus



EoE can wax and wane

M.M. ♂ 1961, Plumber
- 2000 Onset of dysphagia and diagnosis of EE
- 2006 February 26th : Still symptomatic
- 2006 May 3thd : Screening examination for study



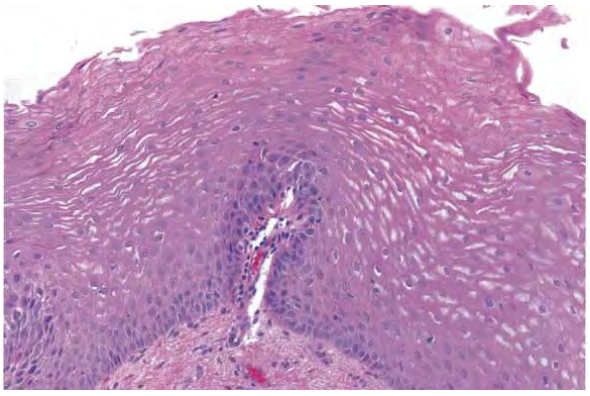
EoE Can progress quickly

W.A. ♂ 1978, Software Engineer

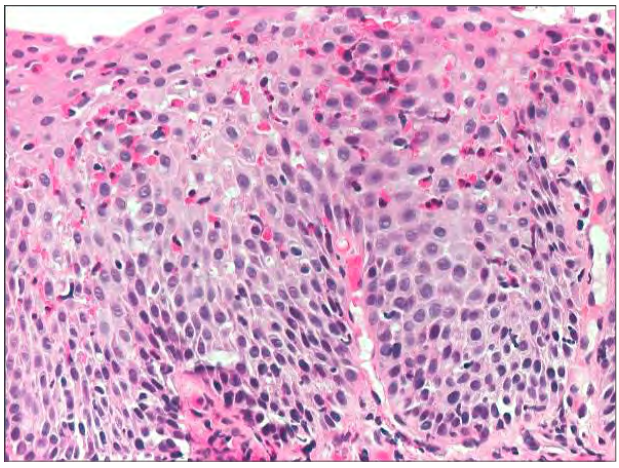
- 2004 Onset of Dysphagia: Endoscopy Sept 2nd
- 2005 Still symptomatic: Endoscopy Sept 8th

Histology of EoE

Normal Histology

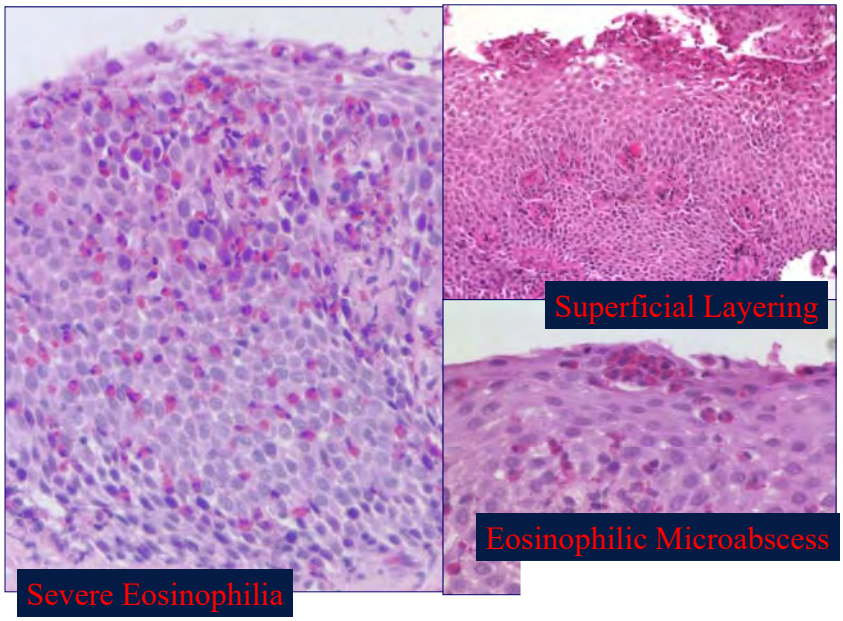


EoE Histology



Eosinophilic Esophagitis

Histology

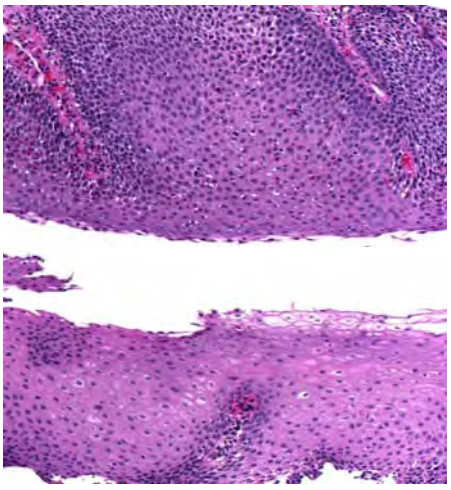


Histology of EoE

Eosinophilia is often patchy

Multiple biopsies are necessary

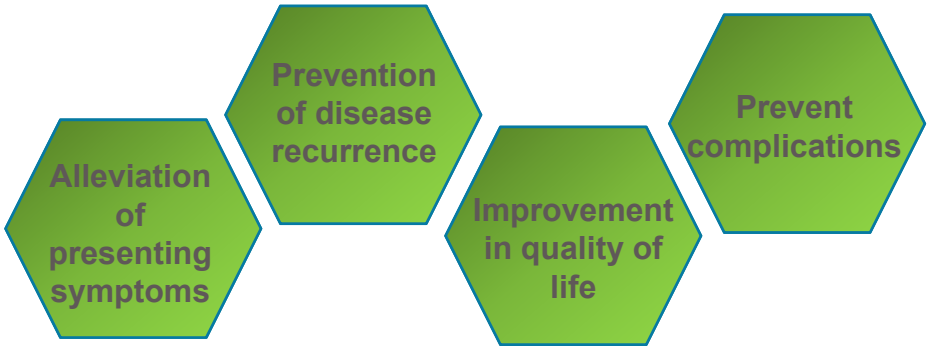
EoE currently determined by the number of eosinophils in most affected field



Treatment

Management Goals for EoE

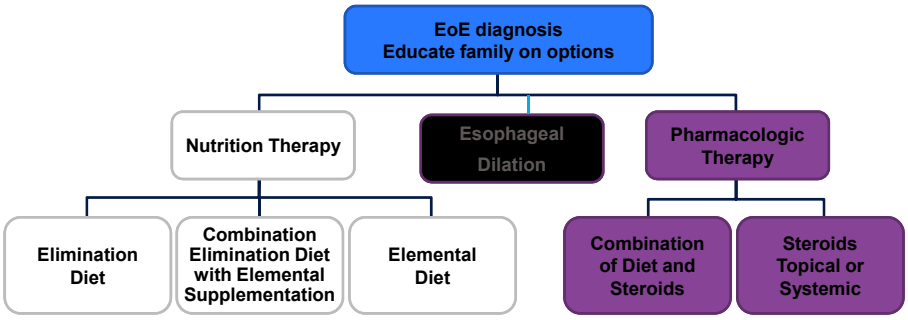
Overall Goals:



Hirano I. Therapeutic end points in eosinophilic esophagitis: is elimination of esophageal eosinophils enough? *Clin Gastroenterol Hepatol.* 2012;10(7):750-752.

Management Options for EoE

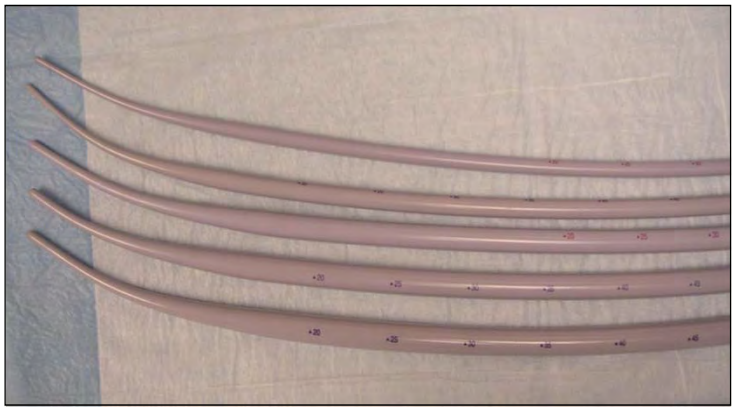
- After EoE is diagnosed by clinicians, taking into consideration all clinical and pathologic information, treatment choices are:



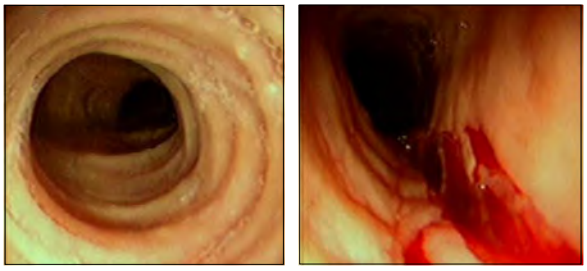
Liacouras CA, Furuta GT, Hirano I, et al. Eosinophilic esophagitis: updated co
children and adults. *J Allergy Clin Immunol.* 2011;128(1

Dilation

Savary Esophageal Dilators



Laceration After Dilation in EoE



Hirano C. Foreign Bodies in the Esophagus. In: Shields, LoCicero, Feins Reed, eds. *General Thoracic Surgery 7th Ed*. Lippincott Williams & Will Publ. Chapter 145.

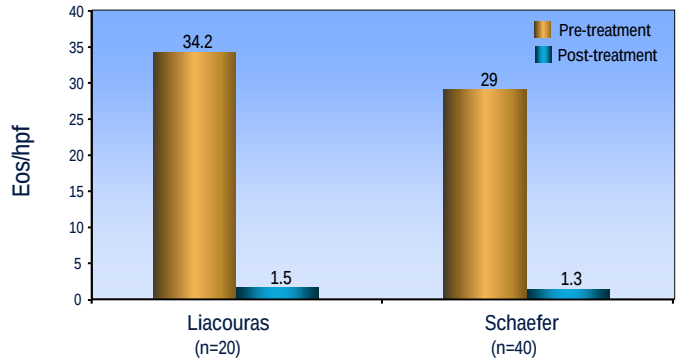
Esophageal Dilation in EoE

- Dilation does not address the underlying disease process
- Relapse is common after dilation although prolonged remission can occur
- Significant risk of long mucosal lacerations and pain
- Esophageal perforation risk is low but consequences can be substantial
- Pharmacologic and dietary therapy is effective at relieving symptoms and treating strictures
- *Whenever possible, pharmacologic or dietary therapy should be attempted prior to esophageal dilation as both reverse EoE*

Furuta et al. *Gastroenterology.* 2007; 133:1342-63.
Liacouras et al. *J Allergy Clin Immunol.* 2011; 128:3–20.

Steroid Treatment in Pediatrics

Oral Steroid Studies



1 mg/kg BID; max 30 mg BID

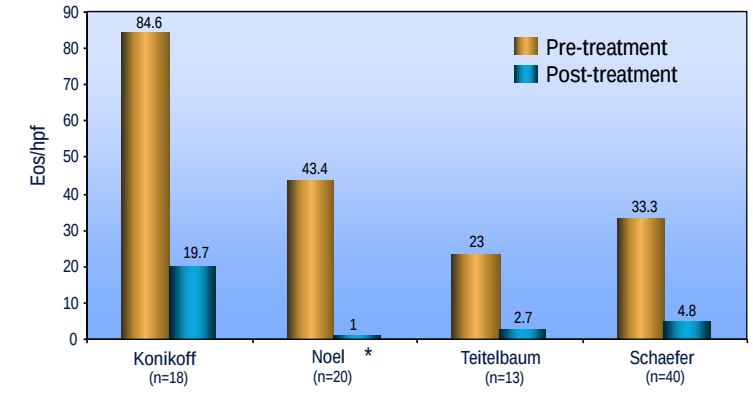
Liacouras et al. *J Pediatr Gastroenterol Nutr.* 1998; 27:90-93.
Schaefer et al. *Clin Gastroenterol Hepatol.* 2008; 6:621-629.

Topical Corticosteroids

- Initial report by Faubion et al, in 1998, in 4 children
- Fluticasone now a common therapy
- Demonstrated improved symptoms and histology
- Side effects not common, and often mild (*Candidiasis* can be seen)

Faubion et al. *J Pediatr Gastroenterol Nutr.* 1998; 27:90.

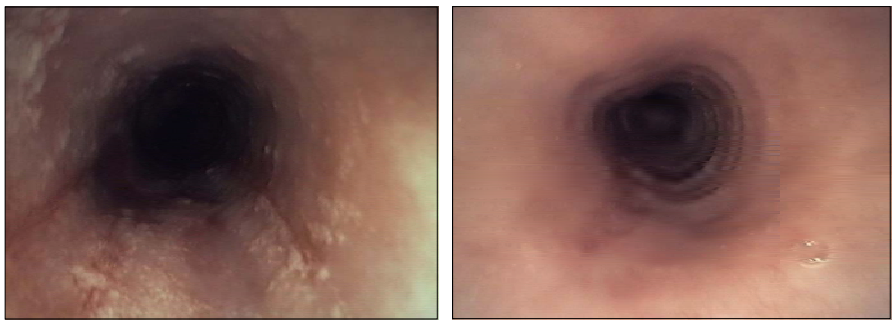
Topical Steroids *(Swallowed Fluticasone)*



*Post treatment data on 16 patients.

Konikoff et al. *Gastroenterology.* 2006; 131:1381-1391.
Noel et al. *Clin Gastroenterol Hepatol.* 2004; 2(7):523-530.
Teilbauam et al. *Gastroenterology.* 2002; 122:1216.
Schaefer et al. *Clin Gastroenterol Hepatol.* 2008; 6:621-629.

White Plaques Before and After Treatment

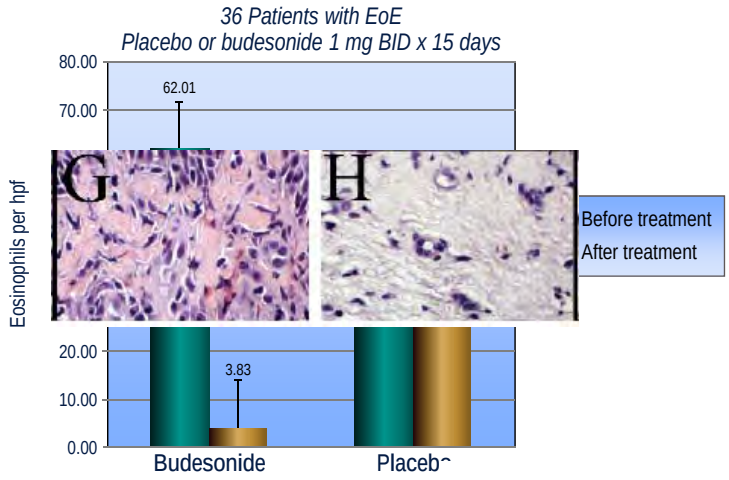


Liquid Budesonide

- Problems with topical fluticasone
  - Difficult to administer
  - Not totally delivered to esophagus
- Advantages of a liquid preparation
  - Easier to administer
  - Close to 100% administered
  - Better topical agent
  - No significant adverse effects; esophageal *Candidiasis* in one patient

Aceves et al. *Am J Gastroenterol*. 2007; 102:2271-2279.

Randomized, Double-Blind Placebo Controlled Trial Budesonide (BEE Trial)



Straumann et al. *Gastroenterology.* 2008; 134(Suppl):A104.

Guidelines for Corticosteroids in EoE

- Systemic and topical corticosteroids effectively resolve the acute clinico-pathological features of EoE.
- When discontinued, the disease generally recurs.
- Systemic corticosteroids may be utilized in emergent cases such as dysphagia requiring hospitalization, dehydration due to swallowing difficulties and weight loss, etc.
  - Because of the potential for significant toxicity their long-term use is not recommended.
- Topical corticosteroids are effective in inducing a remission of EoE when utilized in high doses (pediatrics & adults).
  - The incidence of long term side effects with this form of administration has not been formally studied but currently it is well tolerated (fungal infections).
- Topical corticosteroids are used for maintenance of EoE – in process of long-term studies.

Furuta et al. *Gastroenterology.* 2007; 133:1342-63.
Liacouras et al. *J Allergy Clin Immunol.* 2011; 128:3–20.

Dietary Treatment in Pediatrics

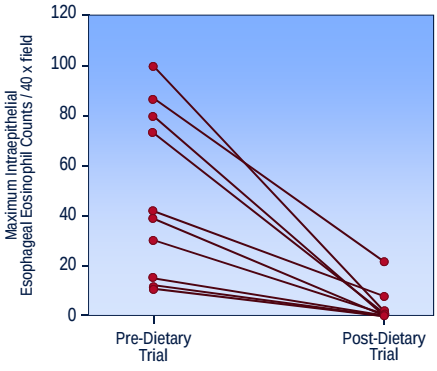
History of Diet and EoE

- In 1995: “Eosinophilic esophagitis attributed to gastroesophageal reflux: improvement with an amino acid-based formula”
  - 10 patients with refractory reflux symptoms, despite medication
  - 6 had received anti-reflux surgery without resolution
  - All with markedly elevated esophageal eosinophils
- Patients given a trial of an “elemental diet”
  - Amino acid based formula
  - Minimized any risk of food allergy

Kelly et al. *Gastroenterology.* 1995; 109:1503-1512.

Diet and Eosinophilic Esophagitis

- After elemental diet:
  - Symptom resolution in 8 patients, improvement in 2
  - Improvement occurred within 3 weeks
  - Biopsies improved as well
- Symptoms returned after food was reintroduced
- Conclusions:
  - EoE is an allergic phenomenon
  - EoE improves with food elimination



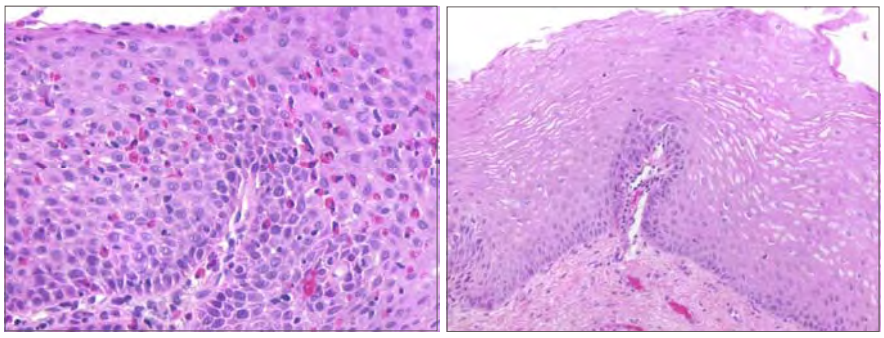
Dietary Management
Amino Acid–Based Formula

- 172 Patients (128 nasogastric tube, 32 oral, 4 failed, 8 noncompliant)
  - 160 patients completed therapy
- Patients evaluated 4-6 weeks after instituting diet

160 Patients	Pre-diet	Post-diet	*P* Value
Eosinophils per hpf	38.7 ± 10.3	1.1 ± 0.6	<.001
Dysphagia	30	1	<.01
GERD symptoms	134	3	<.01

Liacouras et al. *Clin Gastroenterol Hepatol.* 2005; 3:1198-1206.

EoE – Elemental Diet



Before After

Amino Acid Based Formulas in Adults

- Peterson et al. (2013)
  - Group of adults on an elemental diet
  - 70% with histologic response to < 10 eos/hpf
  - 50% with histologic response to normal (few or no eos)
  - Problems
    - Symptomatic response difficult
    - Problems with assessment tool
    - Problems with compliance

Advantages of Amino Acid Based Diet

- Extremely effective therapy for EoE
- Great for patients with FTT, young children and for those in which no other therapy is effective
- When administered correctly:
  - > 95-98% demonstrate complete clinical and histologic response
  - Allows systematic re-introduction of foods
- Shown to be effective for anyone - adolescents and adults

Obstacles to Elemental Diet

- Elemental formula is unpalatable
- Commonly needs nasogastric or gastrostomy tube to administer
- Nutritional status must be monitored closely - DIETICIAN
- Elemental formulas are expensive
  - Variable insurance coverage
  - Usually significant out of pocket expense
- Concern regarding quality of life issues

Other Types of Dietary Therapy for EoE

- Selective Diet
  - Empiric Diet
  - Directed (Targeted) Diet

Empiric (SFED) Elimination Diet

- Six food elimination diet (SFED)
- 60 EoE patients – retrospective review but compared
  - 35 given diet without milk, soy, wheat, egg, peanut, nut and fish
  - 25 given amino acid formula
- Biopsies done at start compared with 6 weeks of diet therapy
- Improvement in restricted group 75% while amino acid group 90+%

Kagalwalla et al. *Clin Gastro Hepatol.* 2006; 117(2Suppl):S470.

SFED in Adults

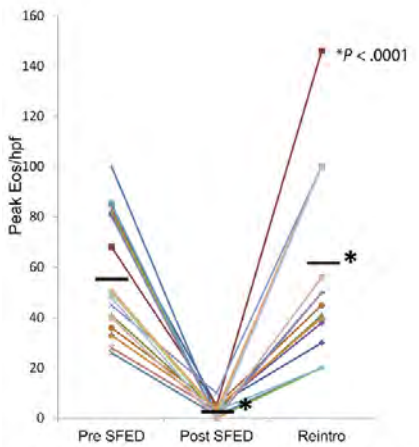


Figure 6. Peak eosinophil counts in the esophagus at baseline, after the SFED, and after reintroduction of the trigger food. After the trigger food has been encountered, peak eosinophil levels increase to close to baseline levels seen before the SFED (N = 20).

Gonsalves et al Gastroenterology 2012

Empiric Diet Elimination

- Benefits
  - Easy, do not need testing
- Problems
  - May not eliminate all foods necessary to induce remission
  - May eliminate foods that are not necessary to be eliminated
  - May prolong the process of food elimination and re-introduction

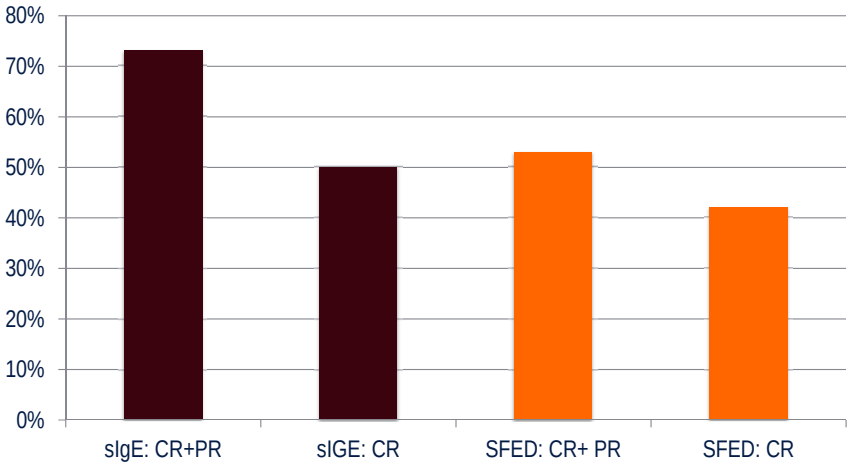
Allergy Food Testing in EoE

Serum IgE tests

Allergy Food Testing in EoE

- Despite pathogenesis of EoE not being an IgE related disease
- Some investigators have used the combination of skin prick tests (SPT) and atopy patch tests (APT) to identify causative foods
  - To be effective need to be very experienced with the use of patch testing
- Problems
  - SPT only identify IgE mediated allergy - not etiology of EoE but could have association
  - Serum IgE tests – EoE not IgE mediated
  - APT not a standardized test – each investigator often preparing test and reading test differently – hard to duplicate results

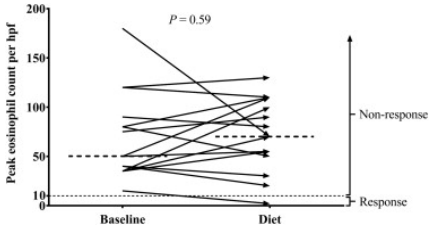
Allergy Testing vs Empiric Histology



Rodqiguez-Sanchez et al. Allergy 2014

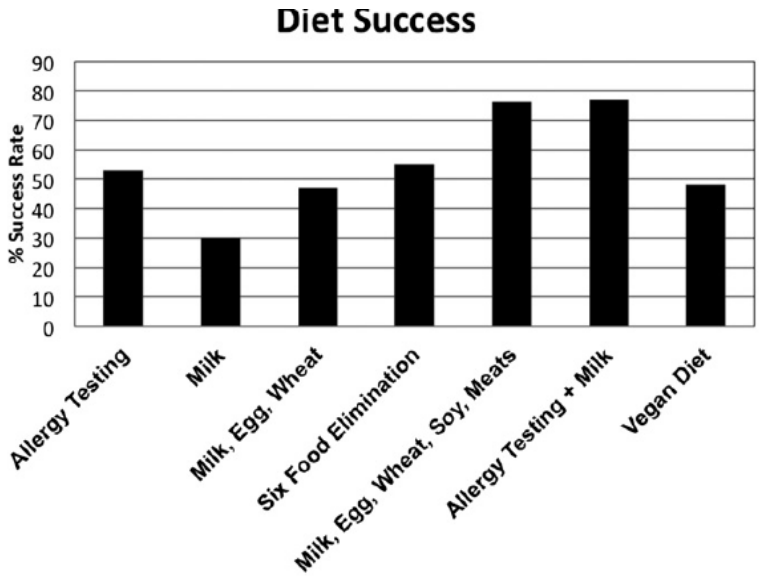
Microarray Testing in EoE

- Van Rhijn et al (2015) letter
- 40 adults
- Diet based on microarray IgE testing
- Compared to Immunocap, specific IgE testing
- No significant response
- IgE testing ineffective



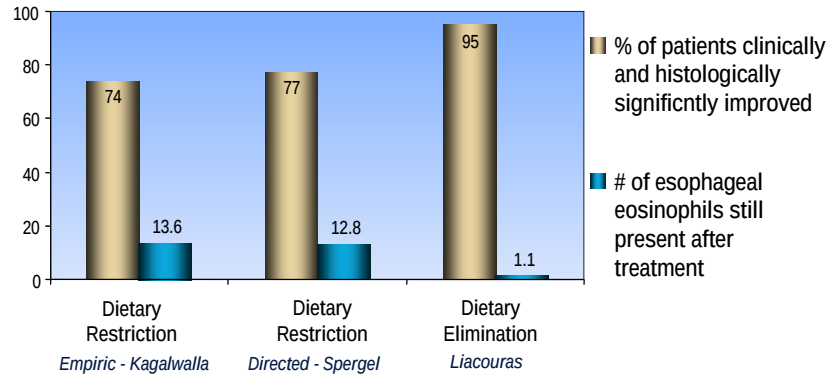
van Rhijn et al J Allergy Clin Immunol 2015

What method is best?



Spergel et al J Allergy Clin Immunol 2012; 130:461-7

Response of 3 Types of Dietary Restriction



Kagalwalla et al. *Clin Gastroenterol Hepatol.* 2006; 117(2Suppl):S470.
Liacouras, et al. *Clin Gastroenterol Hepatol.* 2005; 3:1198-1206.
Spergel et al. *Ann Allergy Asthma Immunol*. 2005; 95(4):336-343.

Guidelines for Dietary Therapy in EoE

- Dietary therapy (AA formula, SFED, directed diet) should be considered and discussed in all patients – ADULTS & CHILDREN – who have a diagnosis of EoE
- Many adults with EoE are interested in diet therapy
- Dietary therapy has also been shown to reverse esophageal fibrosis.
- All modes of dietary therapy successful in children and adults
- Allergists important for dietary treatment and for other associated atopic disease
- For ALL dietary therapy, consultation with a registered dietician is strongly recommended to ensure proper calories and micronutrients.