Eosinophils in the GI tract From EoE to EGIDs to HES

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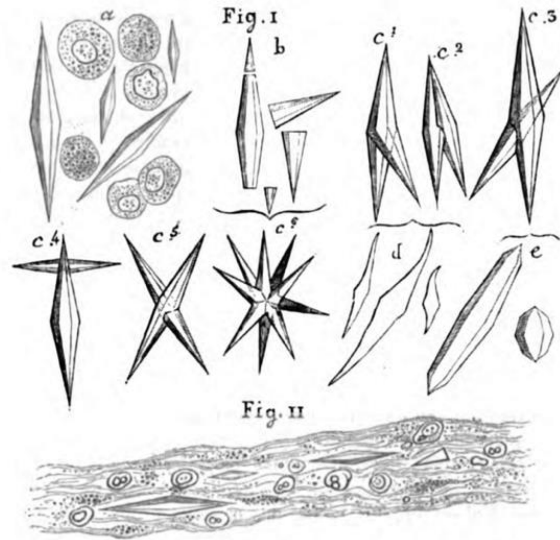
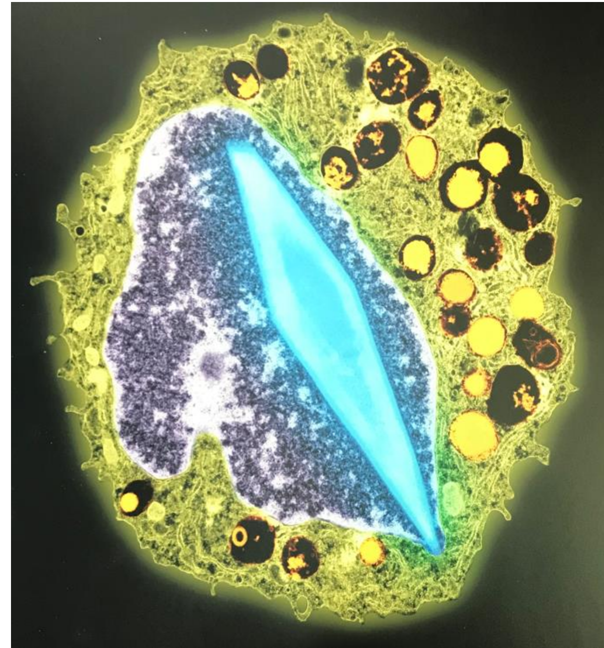
Eosinophils normally reside in the GI tract ....except in the esophagus

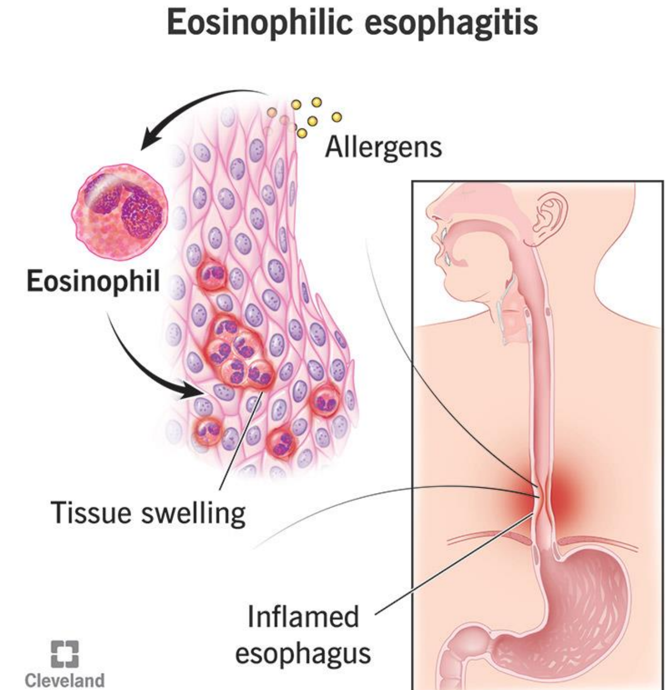


[Charcot et al. 1860]



A rare image of a bipyramidal Charcot-Leyden crystal (light blue) formed within the nucleus of an immature human eosinophil growing in cell culture. TEM

Dr. Rossana Melo et al. IES Biennial Meeting 2023



- To **be aware** of the approach to diagnosis of eosinophilic esophagitis (EoE) and eosinophilic gastrointestinal disorders (EGID) including emerging diagnostics tests
- To **identify** the clinical presentations, diagnostic criteria and consensus definitions of EoE and EGID
- To **recognize** current evidence-based treatment approaches (and controversies or knowledge gaps) for EoE and EGIDs

Case#1 Jeff

28 yo real-estate broker

Symptoms and Initial Presentation

- At dinner with clients he tries not to eat much due to abdominal pain and difficulty swallowing
- He drinks a lot of liquids and eats slowly
- One episode of food getting stuck 6 months ago
- EGD 1.5 years ago was "normal" in appearance
- 2 biopsies of the esophagus were taken: non-specific inflammatory changes, no H. pylori and were "suggestive of reflux"
- PPI therapy for 6 months was unhelpful

Presentation to your office

- You take a detailed history and can't find any specific trigger foods that are suggestive of an IgE-mediated food allergy, nor any significant personal atopic history
- If this were EoE, you find it odd that he has no allergies: No allergic rhinitis, no atopic dermatitis, no wheezing as a kid, nothing.
- You defer sIgE testing

Case#1 Jeff

28 yo real-estate broker

Follow-up

- The following week Jeff calls your nurse and gives a history of a prolonged episode of a sausage piece getting stuck. It passed after an hour.
- You tell him to call his gastroenterologist—he needs to be seen and re-scoped
- What does Jeff have?

Bias #1: Premature closure

DDx of Dysphagia & Strictures

Mucosal Mechanical Causes

- Peptic (acid) esophagitis/stricture
- Systemic diseases with acid secretion
  - Sclerotic diseases
  - Zollinger-Ellison syndrome
- Infectious esophagitis
- Pill esophagitis
- Toxin or caustic esophagitis (e.g lye)
- Radiation esophagitis
- Eosinophilic Esophagitis

Extra-esophageal Causes

- Mass effect
  - mediastinal mass, LAD
- Altered anatomy
  - enlarged aorta
  - aberrant sublclavian a
  - enlarged LA
  - cervical osteophyte

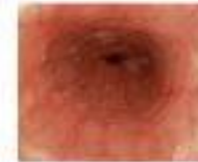
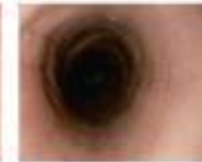
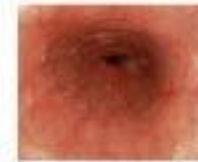
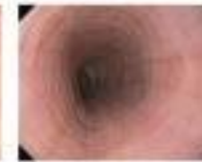
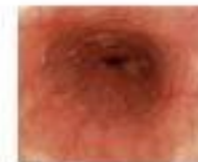
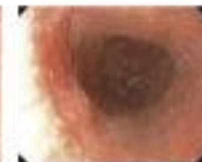
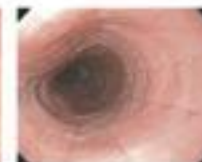
Motility or Functional Causes

- Achalasia
- Chagas disease
- Other motility disorders

If typical treatment for a common condition is not effective, keep looking!

Bias #2 Anchoring: normal appearance in 10%

EoE **E**ndoscopic **R**e**F**erence **S**core (EREFS)

	Grade 0	Grade 1	Grade 2	Grade 3
Edema (loss of vascular markings) • Grade 0: Distinct vascularity • Grade 1: Absent or decreased				
Rings (trachealization) • Grade 0: None • Grade 1: Mild (ridges) • Grade 2: Moderate (distinct rings) • Grade 3: Severe (scope will not pass)				
Exudate (white plaques) • Grade 0: None • Grade 1: Mild (≤ 10% surface area) • Grade 2: Severe (> 10% surface area)				
Furrows (vertical lines) • Grade 0: None • Grade 1: Mild • Grade 2: Severe (depth)				
Stricture • Grade 0: Absent				

Not taking biopsies of normal appearing mucosa can result in a missed diagnosis!

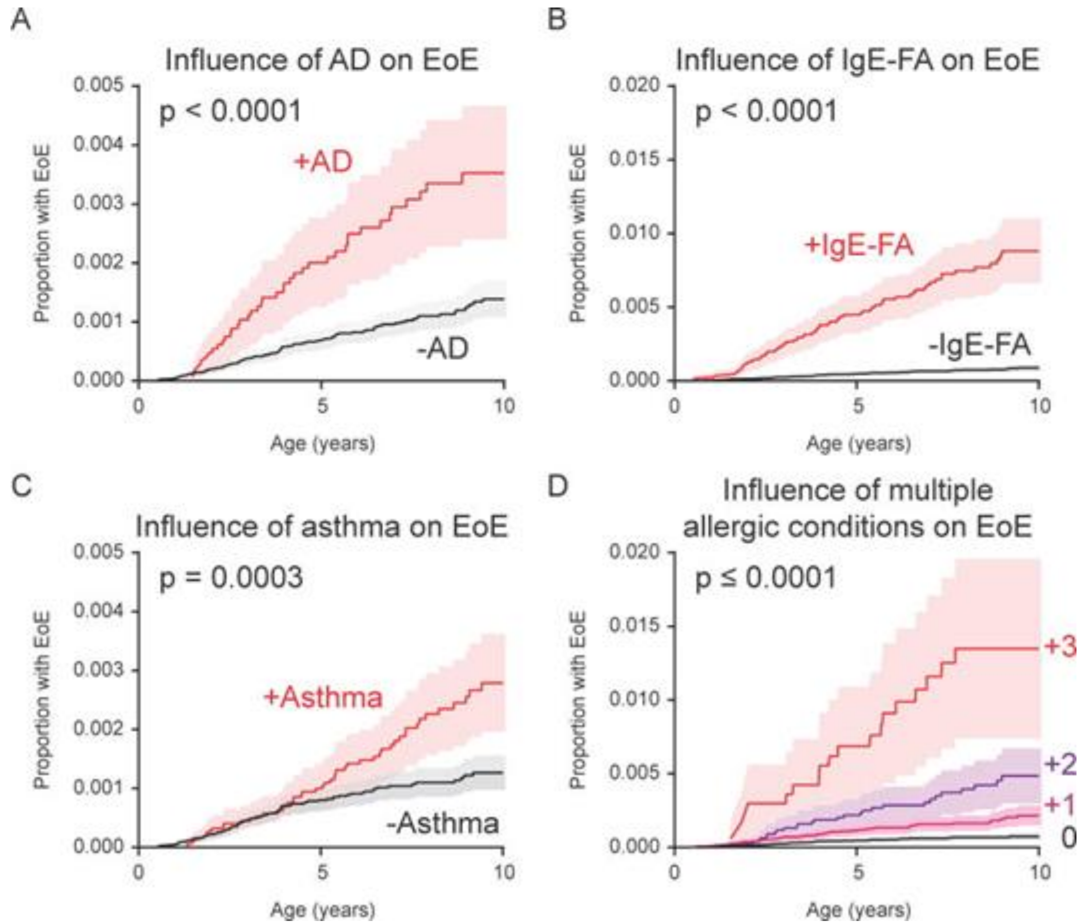
Bias #2b Anchoring: “IMPACT” behaviors

Behavior Description	
Imbibing fluids	Drinking a lot of liquids to help get each bite down smoothly.
Modifying foods	Cutting foods into small pieces or pureeing foods.
Prolonging mealtimes	Eating slowly and being the “last one at the table.”
Avoiding hard texture foods	Meats, crusty breads, and foods with sticky consistencies are often removed from the diet to minimize symptoms.
Chewing excessively	Thorough chewing to achieve a mush-like consistency to allow easier swallowing.
Turn Away Tablets and Pills	Pill dysphagia is a subtle symptom of EoE and may be the only indication of swallowing dysfunction.

Importance of IMPACT behaviors in diagnosis

Adapted from Dellon ES et al, ACG Clinical Guideline: Diagnosis and Management of Eosinophilic Esophagitis 2025

Bias #3: Framing--associating EoE with atopy



Comorbid Conditions

Condition	EoE cohort, % (N = 950)	UPHS prevalence, % (N = 3,617,345)
Asthma	36	3.7
Allergic rhinitis	70	3.5
Atopic dermatitis	14	2.8
Food allergy	24	0.49
Pollen food allergy syndrome	34	0.07
Drug allergy	30	0.42
Latex allergy	3	0.1
Anaphylaxis	16	0.24
Autoimmune disease	9[a]	4[a]
Psychiatric disease	21[a]	8[a]

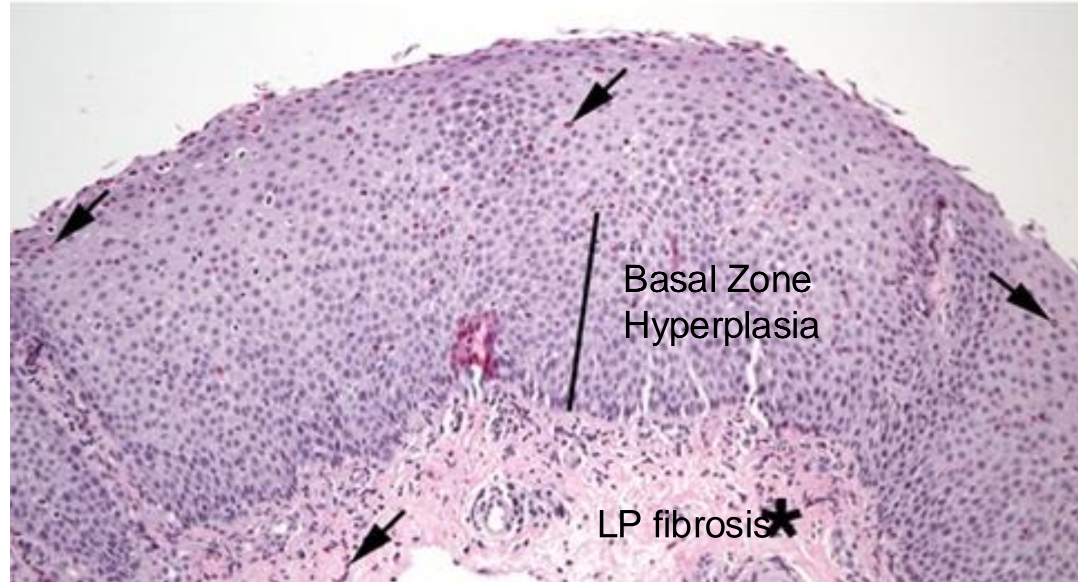
IL4	*TSLP*	EoE (n) / no EoE (n)	OR (95% CI)
-	-	275/409	1 †
-	+	180/213	1.25 (0.96, 1.62)
+	-	139/131	1.55 (1.15, 2.09) *
+	+	99/48	3.67 (2.48, 5.52) **

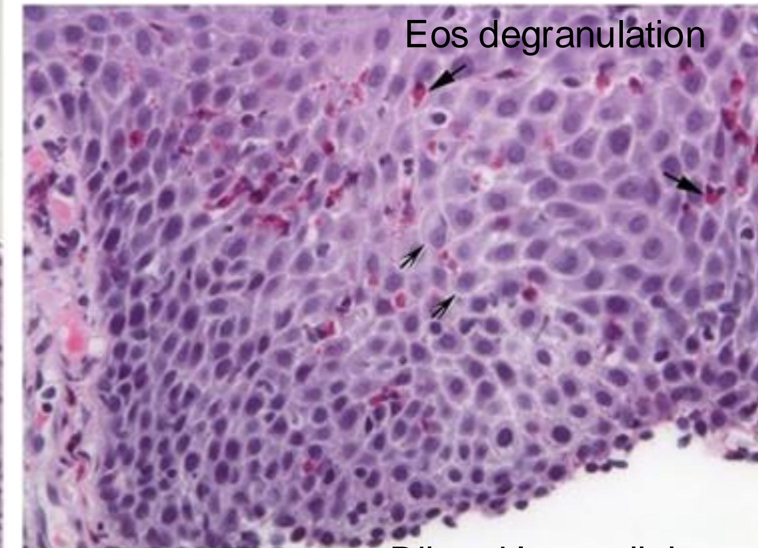
0 1 2 3 4 5 6 7

Not all EoE (esp in adults) is associated with allergic comorbidities!

Martin L, JACI 2012; Hill D JACI-IP 2018; Leigh L Ann All Asth Imm 2018

Bias #4: (not enough) Information bias

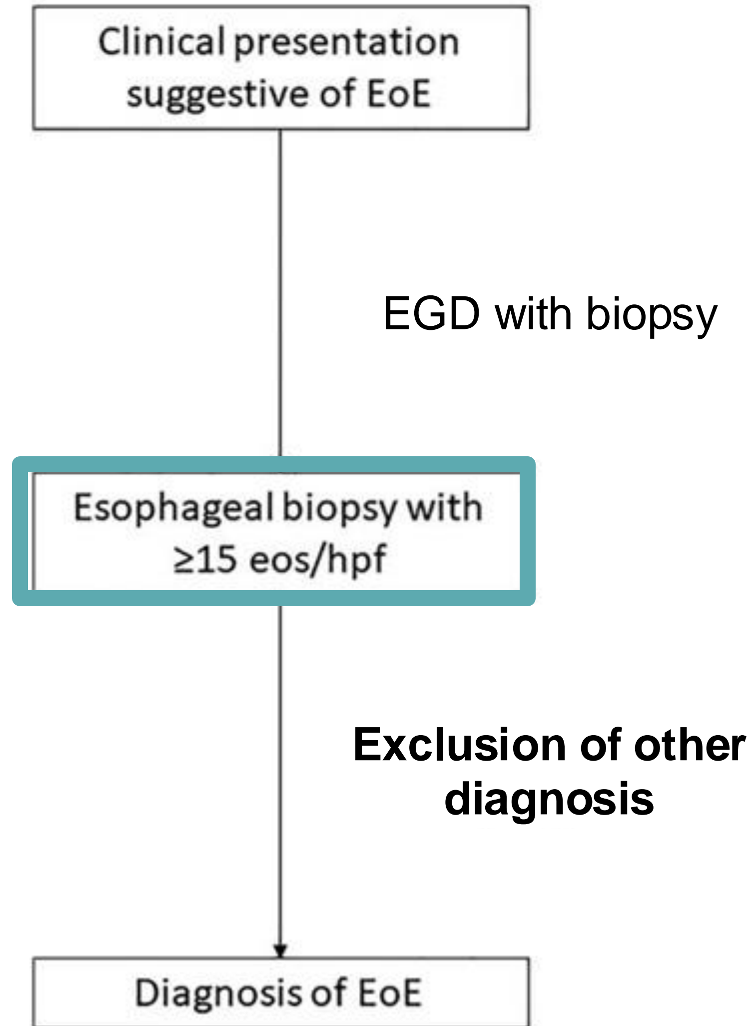


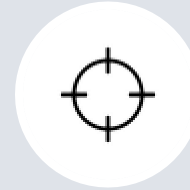


Dilated Intracellular
Spaces

Inadequate, too few biopsies, or insufficient analysis for HPFs or other features of EoE could result in a missed diagnosis

Diagnostic criteria EoE





Symptoms of esophageal dysfunction
Modification and avoidance "IMPACT" behaviors
Feeding dysfunction

Concomitant atopic conditions
Family history of EoE or EGIDs

Assess EREFS
Assess for fibrostenotic disease
Obtain 6 or more biopsy from 2 levels

HES, crohn's disease, pill esophagitis, GERD, multisegment EGID, connective or autoimmune disease

Adapted from Dellon ES et al, ACG Clinical Guideline: Diagnosis and Management of Eosinophilic Esophagitis

Case #2 Tony

- Previously healthy, presented with 2 months of watery diarrhea, and subacute onset of lower extremity swelling.
- On admission has AEC 4500/mm^3, anemia, low albumin
- Endoscopy reveals normal appearing mucosa, no significant eosinophilia on random biopsies taken in the stomach and duodenum
- Review of prior testing with his PCP reveals normal CBC, parasitic serology and O&P unrevealing
- He is discharged with furosemide po and referred to you, the allergist, for peripheral eosinophilia and suspected HES

46 yo product engineer

Case #2: in office

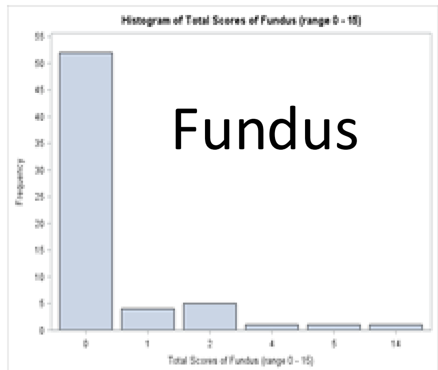
- You take a thorough history: no prior allergic history, no asthma/sinusitis, born-raised in the US, lives in NJ and only travel is to Florida for vacations at Aunt's beach house
- PE: pitting edema, decreased breath sounds right lung base, abdominal bloating despite lasix
- Workup for myeloid HES is unrevealing, B12 is low, tryptase is normal, *PDGFRA* testing negative
- You send the patient for CT Chest/Abd/Pelvis:
    - small right pleural effusion, no infiltrates, abdominal wall edema, and mild-mod ascites. No organomegaly or lymphadenopathy noted

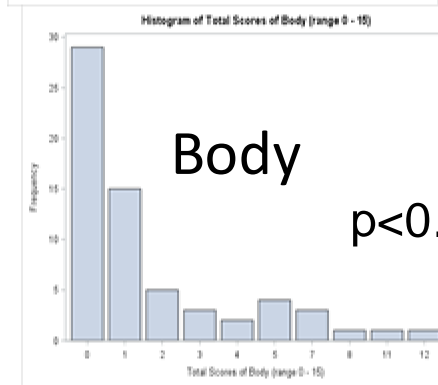
Case #2: Is it EGID?

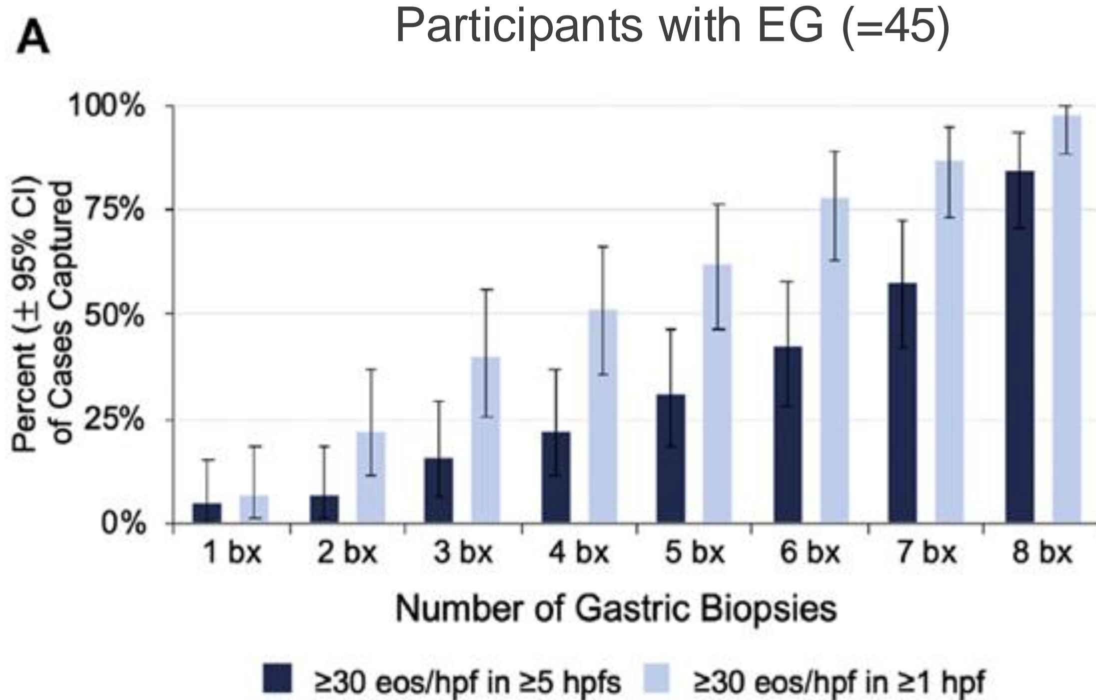
- Learning from your last EoE case you request re-review of the biopsies with enumeration of eosinophils; however, it turns out only 2 biopsies taken in the stomach, 2 in the duodenum.
- You call your surgeon friend to see if he can tap the fluid…he gets the patient in same-day and obtains an ultrasound guided sample
- Peritoneal fluid shows 45% eosinophils
- Tony is successfully treated with a course of systemic prednisone that is weaned to low dose with control of disease
- Unfortunately, with tapering he has some peripheral eosinophilia, worse bloating, early satiety and abdominal pain

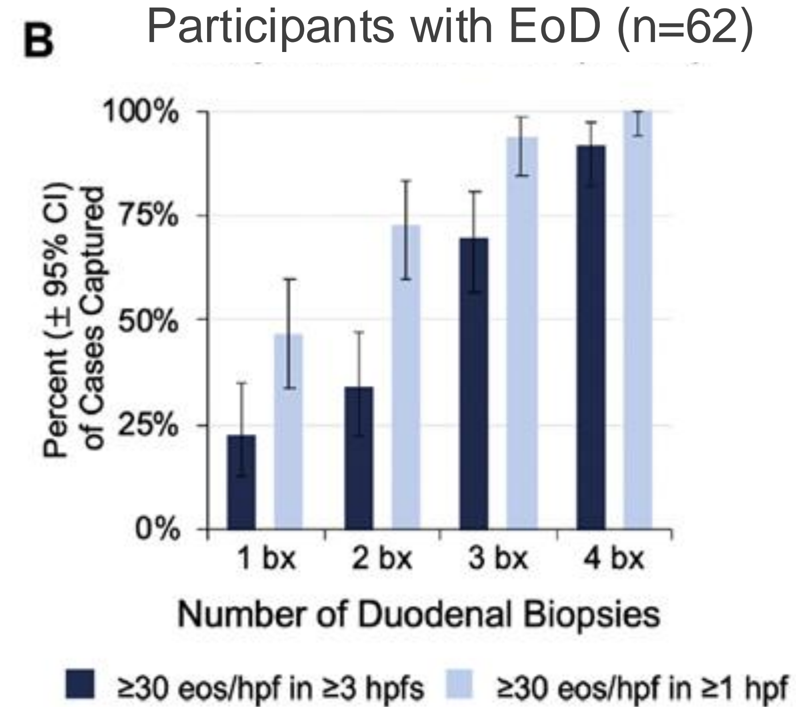
What is the diagnosis? Why did his stomach and duodenal appear normal on endoscopy and on biopsy?

Pitfall #1: Biopsies and reads (again)









Even more so than EoE lack of consensus guidelines lead to less sampling and counting of high power fields. Sometimes only 1 peak count is provided.

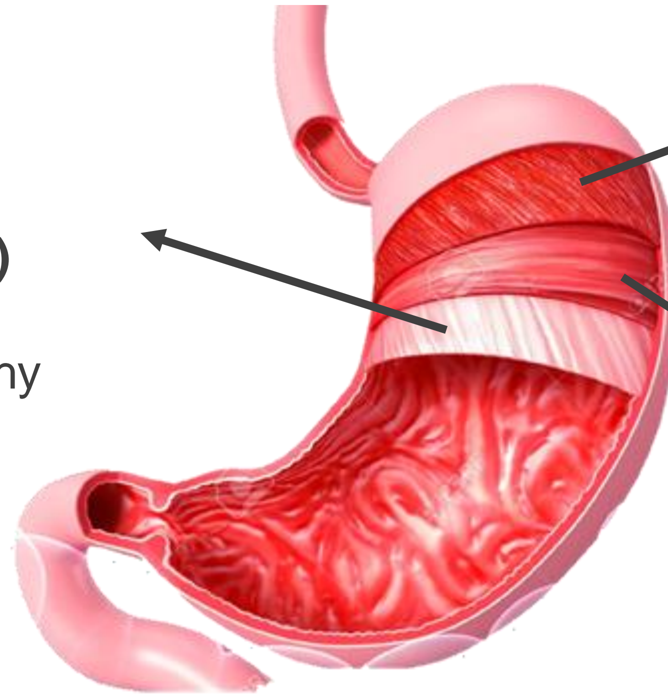
Dellon ES, et al. Clin Gastroenterol Hepatol. 2021

Consortium of Eosinophilic Gastrointestinal Disease Researchers

Pitfall #2 EGIDs may involve more than mucosa

Serosal Disease
Eosinophilic ascites
Pleural effusions

Mucosal Disease
(erosive or non-erosive)
Malabsorption
Protein Losing Enteropathy



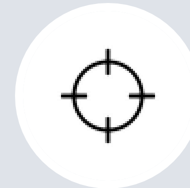
Muscularis Disease
Pyloric stenosis or enteral strictures
Small bowel (or pseudo) obstruction
Severe abdominal pain

Consider involvement of different layers of the GI tract or involvement lower down using alternate means of assessment
(radiographic, surgical biopsies, push enteroscopy)

Consensus criteria for diagnosis currently in development

EoG/EoN

For **mucosal disease**, need chronicity elevated eosinophils in the affected part of the GI tract, and exclusion of alternate causes

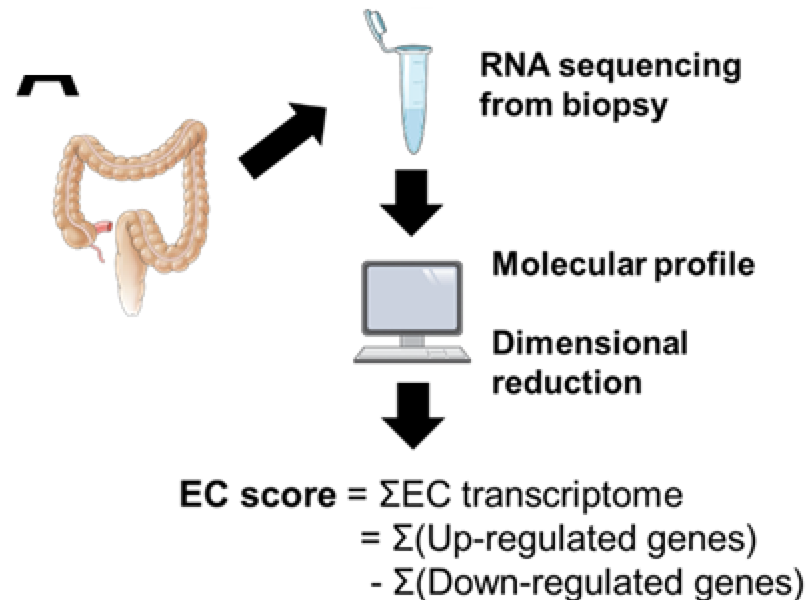


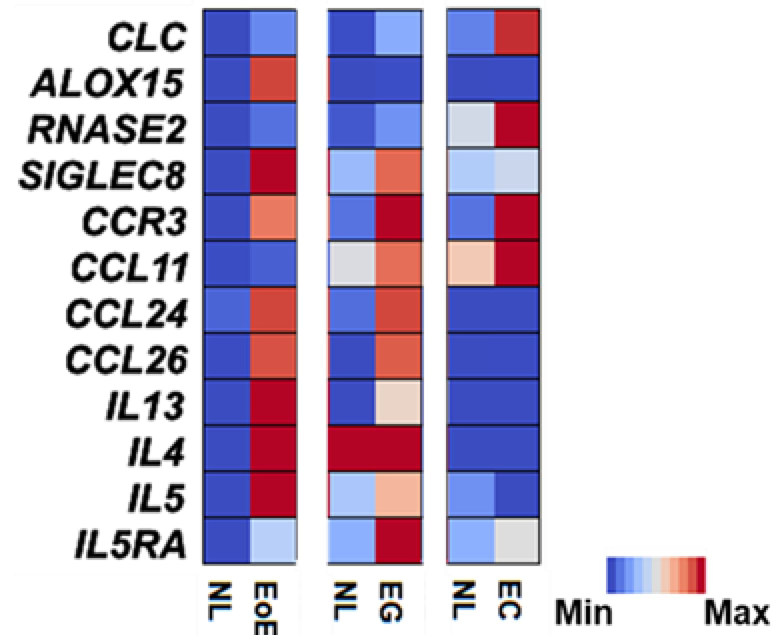
For **muscularis** or **serosal** disease, typical symptoms/chronicity and a biopsy or peritoneal fluid demonstrating elevation in eosinophilia will be required.

Similar to EoE, both an endoscopic scoring system **(EG-REFS)** and supportive pathologic findings (**EoG-HSS**) will be helpful in diagnosis

Eosinophilic Colitis

- Much less is known about EoC; somewhat tricky to diagnose
- Evolving definitions of number of eosinophils/hpf
- Co-occurrence of EG, EGE, and EC diagnoses is common, seen in 41% of patients





CEGIR Consortium of Eosinophilic Gastrointestinal Disease Researchers

Shoda T Gastroenterology 2021

Is it "just" EGID or HES?

Persistent AEC ≥ 1,500 cells/μL = HE - hypereosinophilia

Persistent AEC ≥ 1,500 cells/μL +

Clinical symptoms related to eosinophils = **HES**

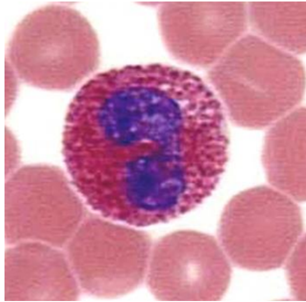
No longer require "≥ 6 months duration" but the AEC should be elevated "on more than one occasion."

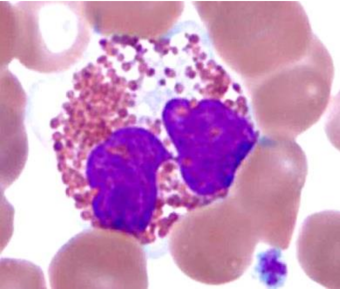
(Klion et al. JACI 2006; Simon et al. JACI 2010; Valent JACI 2012)

Image modified from https://www.absolut.com/us/

Clinical Subtypes of HES

NIH COHORT (n=505)





Myeloid (MHES)

FIP1L1/PDGFRA (>80%)

Primary HES

Idiopathic (iHES)

Lymphoid (LHES)

CD3-CD4+ aberrant T cell population

Reactive or Secondary HES

Familial

Rare autosomal dominant

Overlap (“dual CITIZENSHIP”)

Single-organ disease e.g. EGPA, CEP or

Eosinophilic GI disease

Associated

malignancy, drugs, parasite etc.

Data courtesy of Human Eosinophil Section, NIAID

Overlap HES ("Dual Citizenship")

- Single-organ system involvement with peripheral eosinophilia, indistinguishable from HES
- Examples incl. **EGID**, EGPA, CEP

Diagnostics

Treatment approach similar to "parent" disease

- Same criteria as for "parent" disease

- Is bone marrow biopsy indicated?
- Will the patient go on to develop a "full-blown" HES?
- *One third of those with multi-system HES that included GI symptoms, were initially given a diagnosis of EGID alone***

****Monitor for development of other end organ manifestations**

**(Kuang et al JACI in Practice 2020)

Presented to NIH for
Eosinophilia Evaluation (1998-2018)

Suspected EGID
(n= 84)

Excluded (n=28)
- Alternative diagnosis (n=1, Loey-Dietz)
- Did not meet histopath criteria based on existing slides on hand (n=10)
- Did not have endoscopic procedure with biopsy (n=3)
- Unable to review slides due to subject non-response or off study (n=14)

HES and histopathologic confirmation of EGID
(n=56)

Esophagus > 15 EOS/HPF
Gastric/SI > 30 EOS/HPF
Colon > 60 EOS/HPF

Retrospective Chart Review
- Pathologists
- Allergists
- Gastroenterologists

HES/EGID Overlap
(n=34)

Multi-system HES
(n=22)

Myeloid HES (n=2)
Lymphoid HES (n=2)
EGPA overlap (n=7)
Eosinophilic hepatitis (n=2)
Associated HES (n=1)
Idiopathic HES (n=8)

Are there different clinical features at presentation?

Kuang FL et al 2020 JACI in Practice

GI eosinophilia in the context of HES

HES/EGID Overlap – "single organ"

- GI symptoms + GI eosinophilia
- Hypereosinophilia (>1500 /μL)
- No other organ involvement

Multi-system HES with GI involvement

Often excluded from clinical studies for being "HES"

- GI symptoms + GI eosinophilia
- Hypereosinophilia (>1500 /μL)
- At least one other organ involvement

EGID/HES Overlap

Multi-system HES with GI

Are they distinct disease entities?

HES/EGID Overlap – "single organ"

Multi-system HES with GI involvement

No differences in co-morbid allergic diseases, types of GI symptoms or GI segment eosinophilia

- More likely to be treated with dietary therapy and topical steroids

- More likely to be treated with systemic corticosteroids
- Higher peak historic absolute eosinophil count in blood

Kuang FL et al 2020 JACI in Practice

One third of multi-system HES patients initially present with only GI symptoms

Eventual End-Organ Manifestations	Initial Presentation	
	Pure GI symptoms (n=8)	Multisystem or non-GI symptom presentation (n=14)
Sclerosing Cholangitis	1	1
Cholangitis	1	0
Pancreatitis	0	2
Fever/Chills	1	2
Fatigue	2	1
Sinusitis	1	3
Nasal Polyps	0	4
Oral Ulcers	0	1
DVT/PE, vascular clots	1	2
Splenic Infarct	1	0
Angioedema	1	3
Rash, undefined	2	4
Respiratory Symptoms	4	5
Pulmonary infiltrates	0	3
Arthralgias	1	2
Myalgias/Myositis	0	1
Other	Neuropathy (2)	Cystitis (1)

Median time to first non-GI symptom presentation is 1 year (range: 0.25 – 15 years)

Kuang FL et al 2020 JACI in Practice

Case #3 Jennifer

- 33 yo woman, diagnosed with EoE at age 17
- Self-managed with a dietary approach: she avoids cow's milk, egg and wheat/gluten
- Had been doing well but experiencing dyspepsia and increased food intolerances in the past few years, increased "sticking"
- No endoscopy for 8 years
- EGD 2 weeks ago showed a peak of 55 eos/hpf

33 yo HR specialist

Case #3 Jennifer

- Was referred for more food avoidance recommendations
- She has no food triggers to suggest IgE-mediated food allergy
- History reveals:
    - Pollen-food allergy syndrome (PFAS) with peach and tomato
    - impactions as well as food modification: softer foods, slower swallows to “get by”
- She opts for 6FED after shared decision-making on options
- Follow-up endoscopy after 6FED reveals rings, and peak 17 eos/hpf on histology

33 yo HR specialist

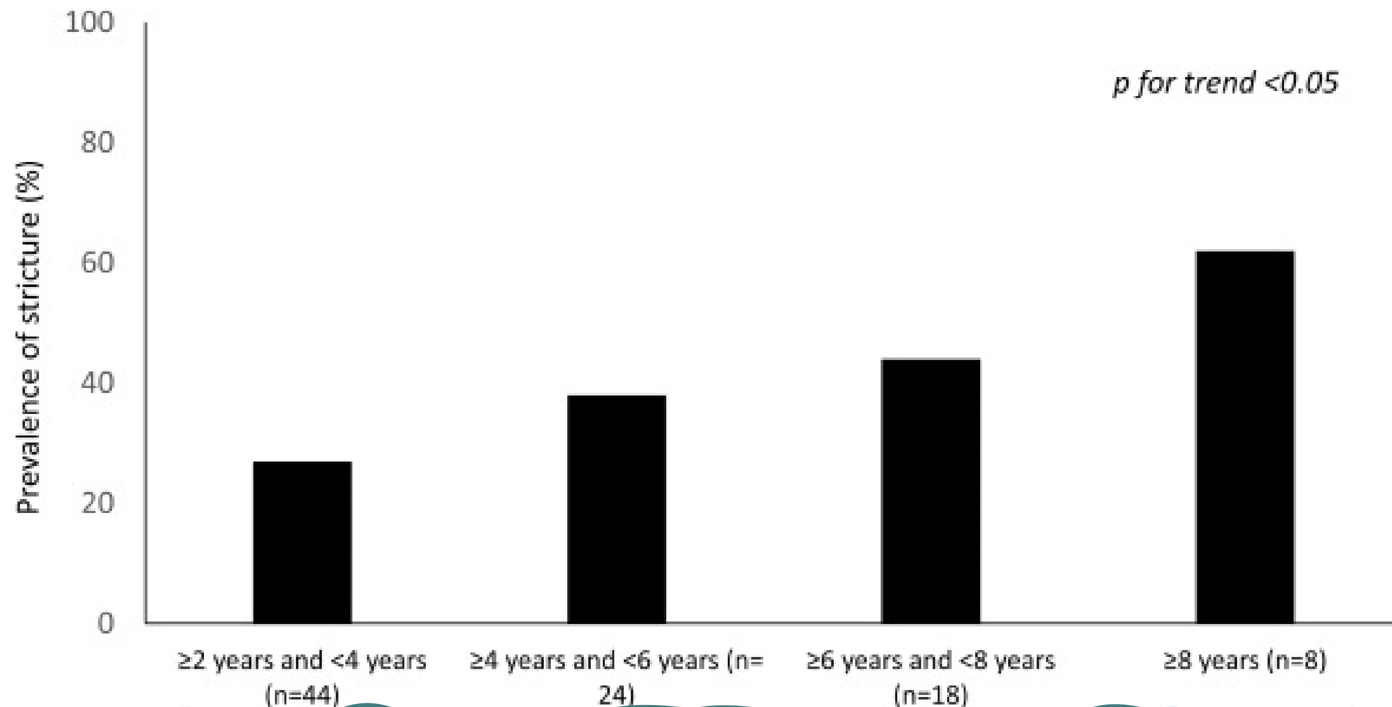
Case #3: 4 years later

- Jennifer is lost to follow between getting an advanced degree, marriage, home purchase
- She is now 2 months post-partum and complains of chest discomfort, reflux and dysphagia.
- Endoscopy:
  - Grade 3 rings with a passable stricture, plaques and edema
  - An esophageal dilation is performed
  - Histopathology: peak 80 eos/HPF, dilated intracellular spaces, and 65 mast cells/HPF

33 yo HR specialist

Gap #1 Lack of consensus on follow up and monitoring timeframes

EoE is a chronic disease, no clinical monitoring (for years) results in inability to detect changes or predict need for altered therapy



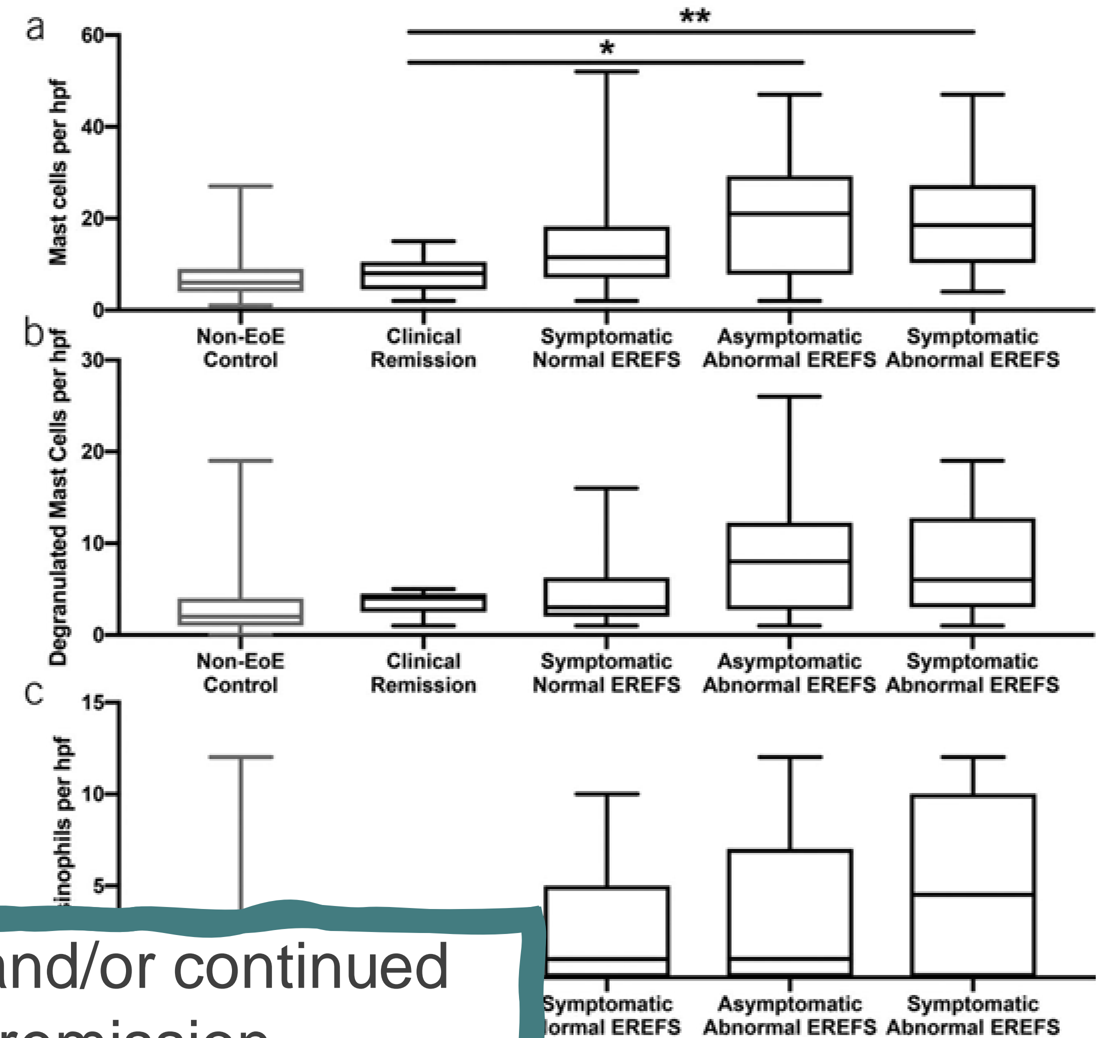
Gaps in therapy or monitoring are associated with increased progression/fibrosis

Chang NC Clin Gast Hep 2021

Gap #2: No consensus on "Remission"

No consensus on Remission definition for eosinophils

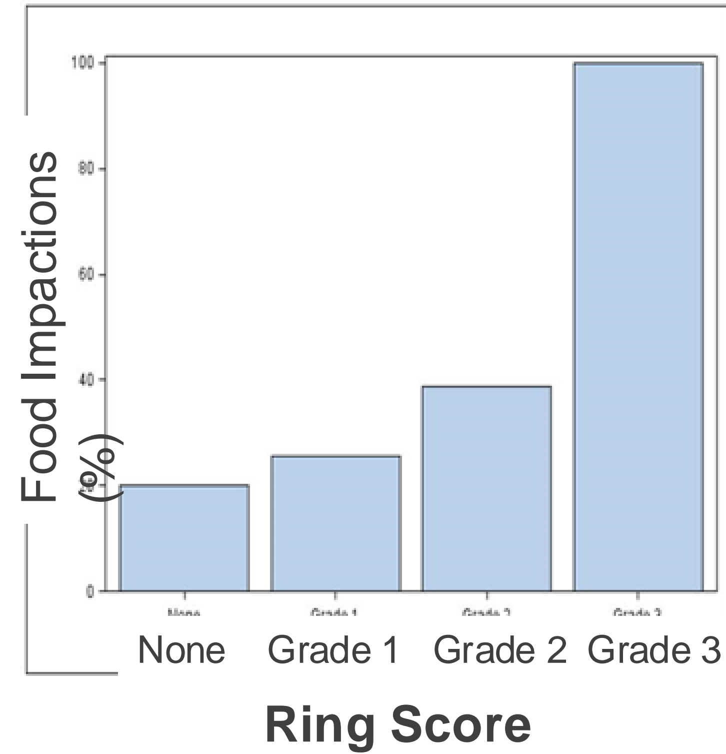
- 0-1 eos/hpf
- 0-6 eos/hpf
- 90% reduction
- Improvement in BZH
- Symptoms

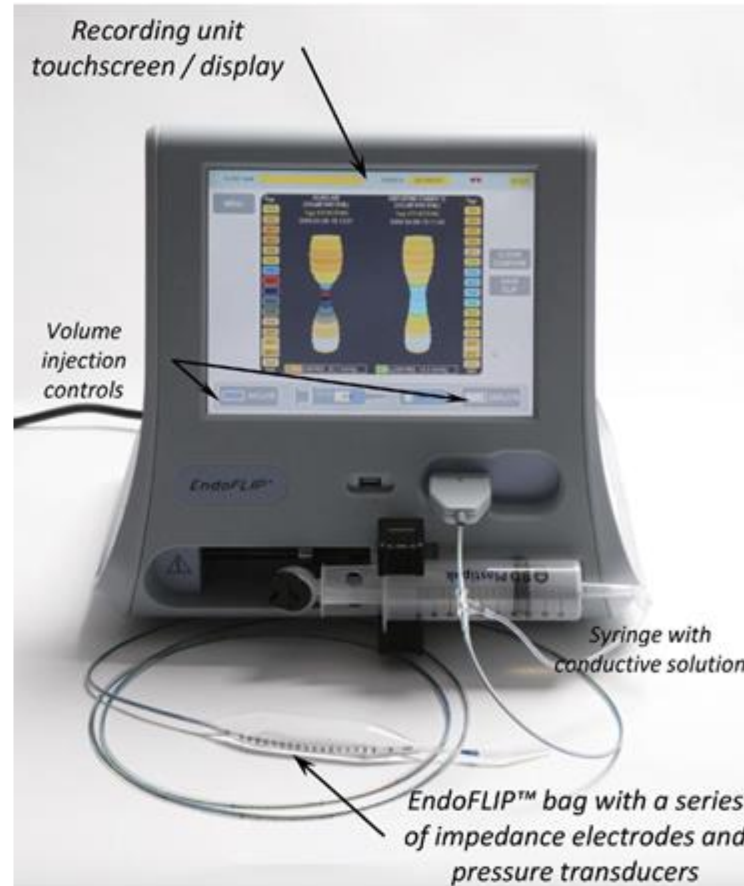


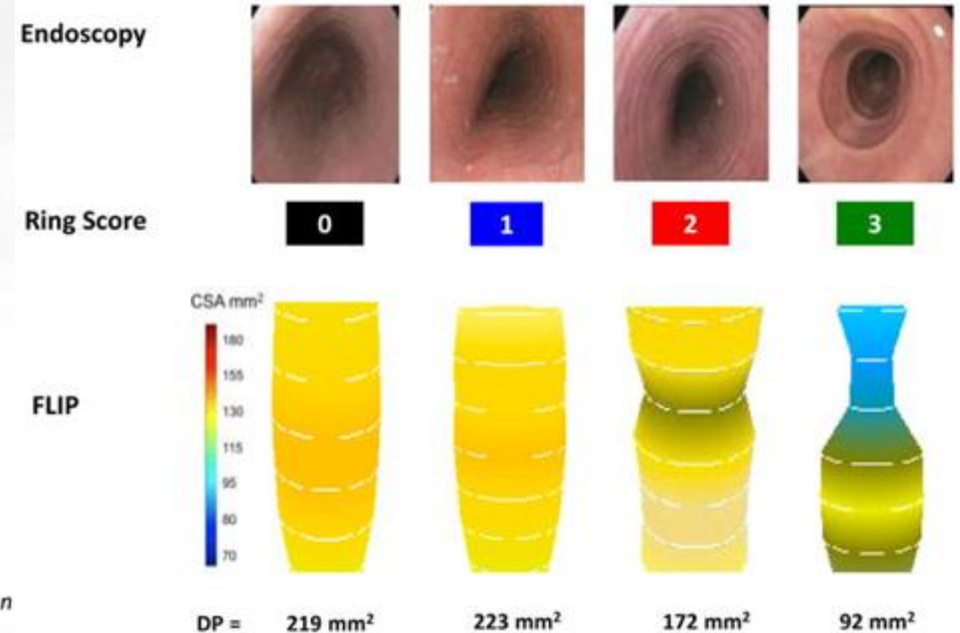
Endoscopic, histologic abnormalities and/or continued symptoms may suggest lack of remission

Bolton SM Am. J Gastro 2020

Gap #3 Lack of availability of esophageal functional assessment

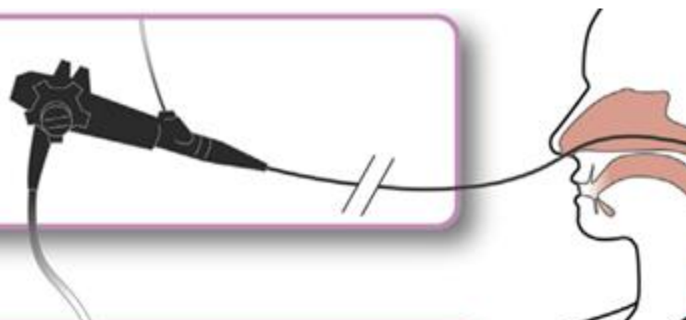


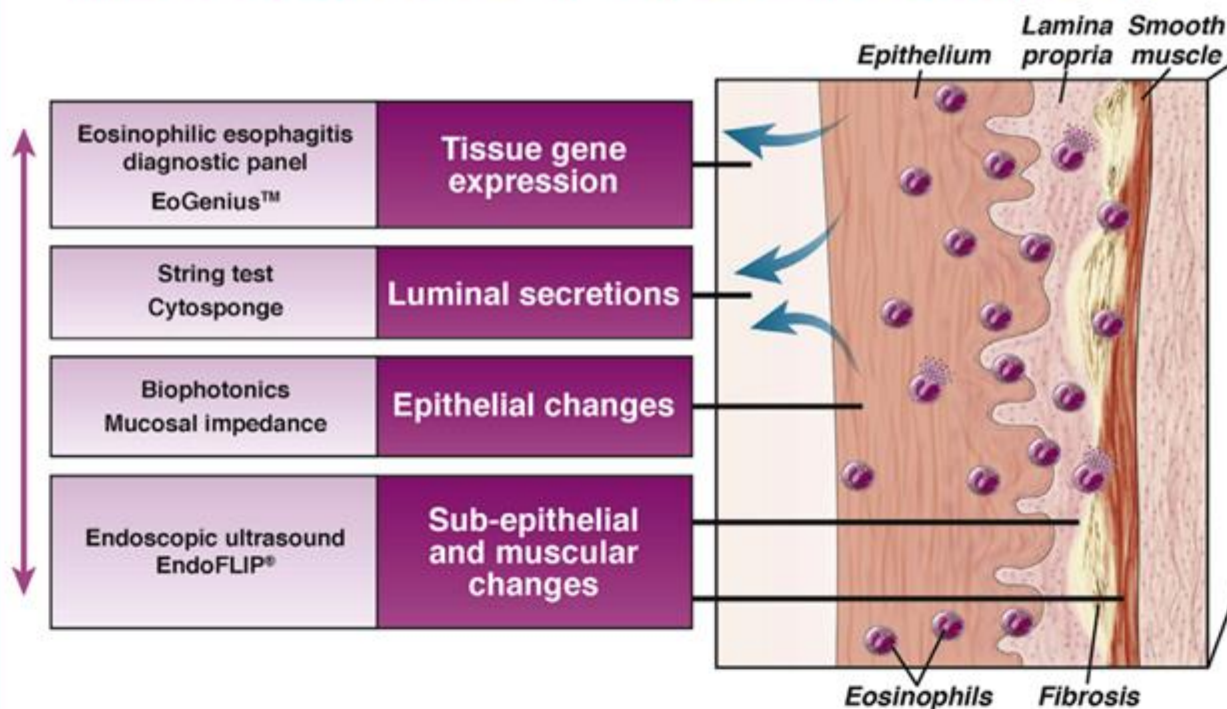


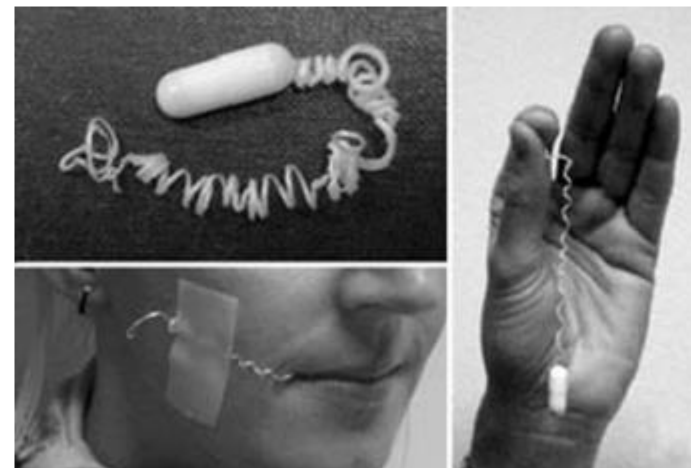


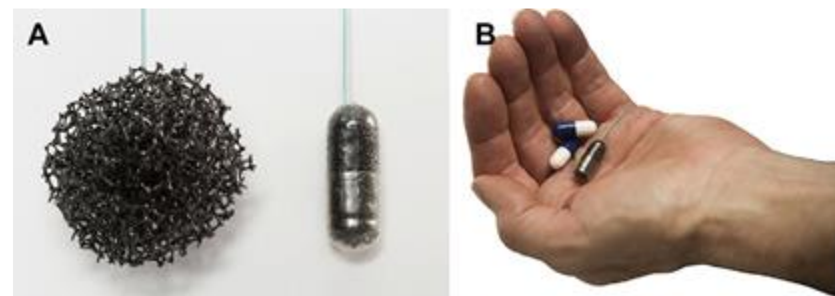
Functional implications are suggested by endoscopic features. Newer diagnostics (EndoFLIP) may be needed

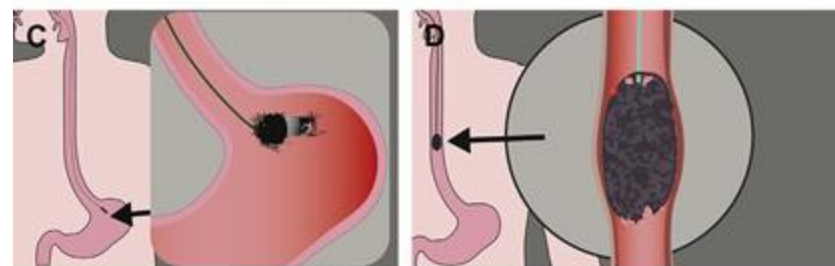
Gap #4: Less invasive diagnostic tools











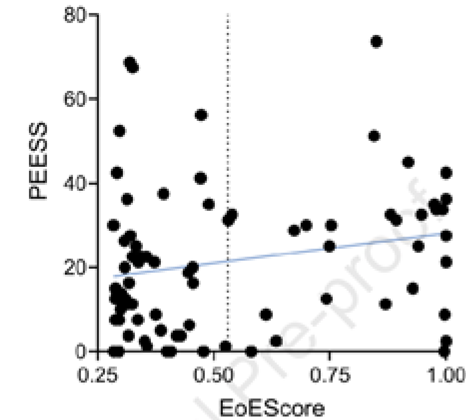
EosSTRING test feasible and tolerable

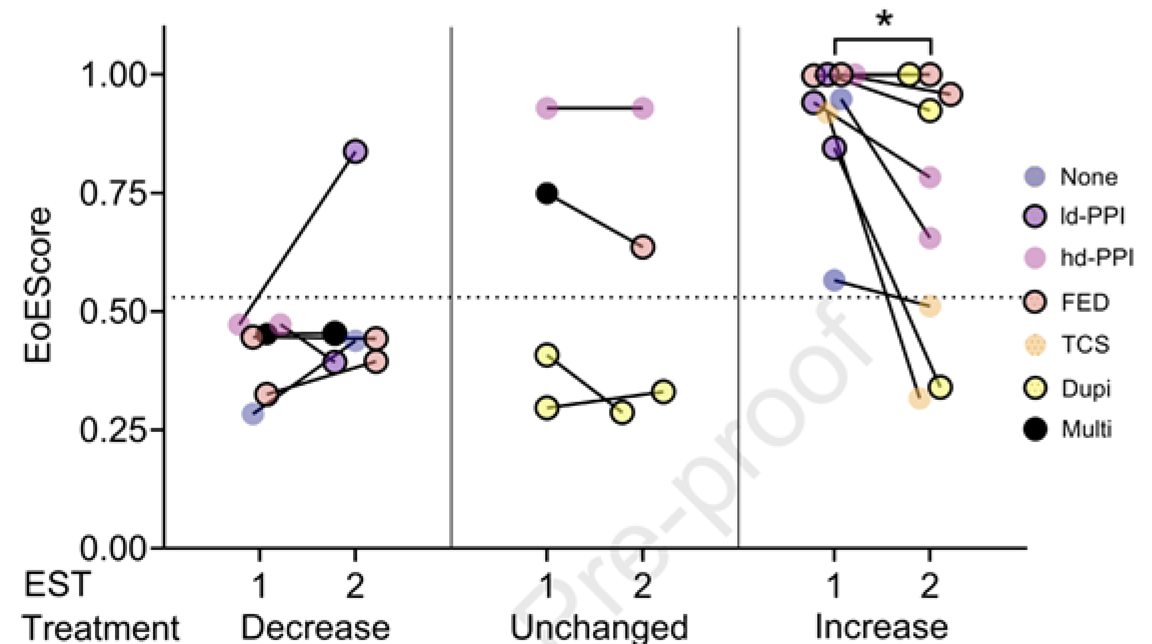
Procedure Overview:

- Dwell time= 1 hour
- Protein collected on the string is extracted.
- Eosinophil-associated proteins measured via ELISA.

EoEScore™:

- Comprises eosinophil markers e.g. eotaxin-3 and MBP-1.
- Discriminates disease activity: ≥ 15 eosinophils/hpf
- Probability threshold: 0.53.
- Sensitivity: 80%, Specificity: 75%.





Chang M JACI IP 2024

Many gaps and controversies regarding dietary therapy

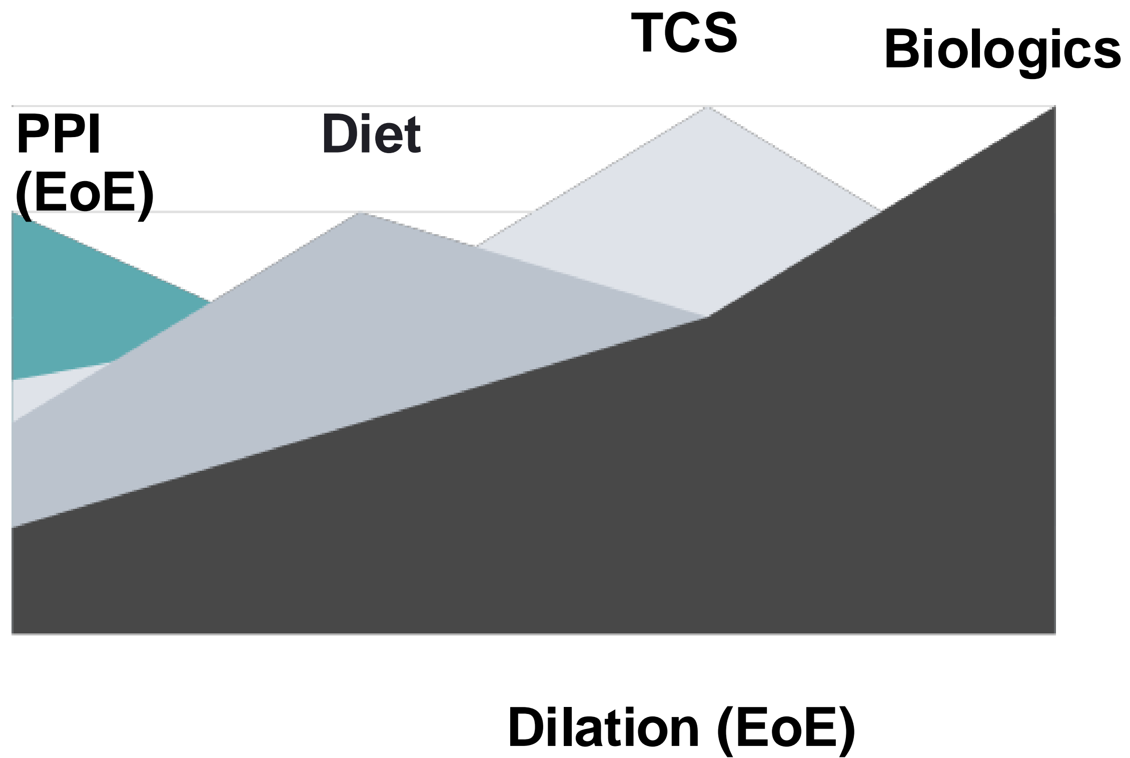
Diet	Details	Efficacy Range
1FED	Dairy elimination alone; also referred to as animal milk elimination	35%–45%
2FED	Dairy and wheat elimination	40%–45%
4FED	Dairy, wheat, egg, and soy elimination	40%–50%
6FED	Dairy, wheat, egg, soy, nuts, and seafood elimination	40%–70%
Elemental formula	Amino acid–based hypoallergenic formula	90% (if adherent)
Allergy test-directed	Not recommended	—

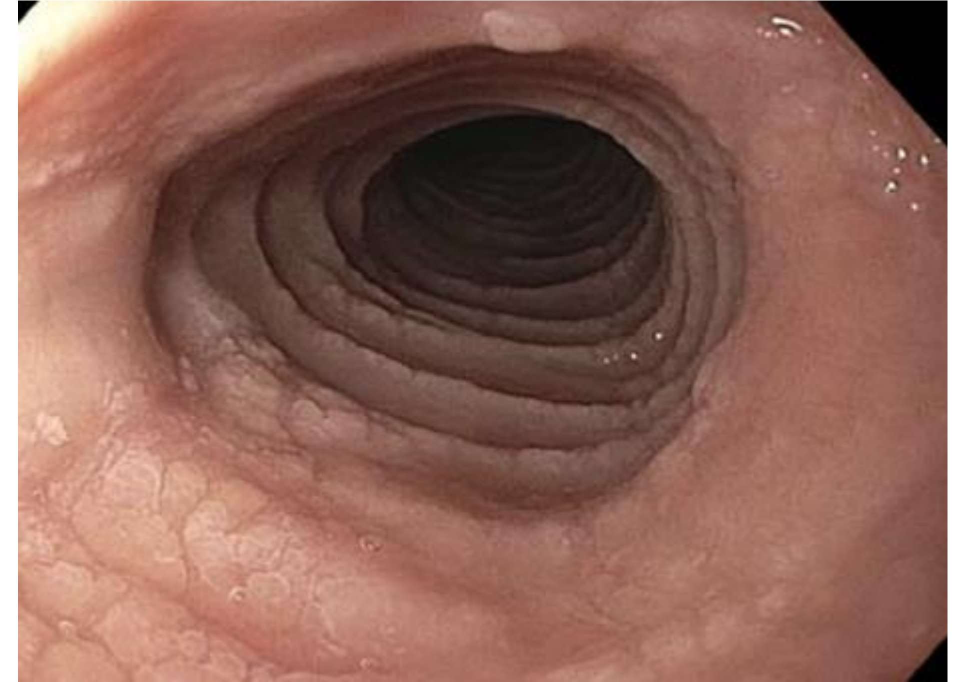
If no remission with dietary approaches, add-on therapy likely needed

- To **be aware** of the approach to diagnosis of eosinophilic esophagitis (EoE) and eosinophilic gastrointestinal disorders (EGID)
- To **identify** the clinical presentations and diagnostic criteria and consensus definitions of EoE and EGID
- To **recognize** current evidence-based treatment approaches (and controversies or knowledge gaps) for EoE and EGIDs

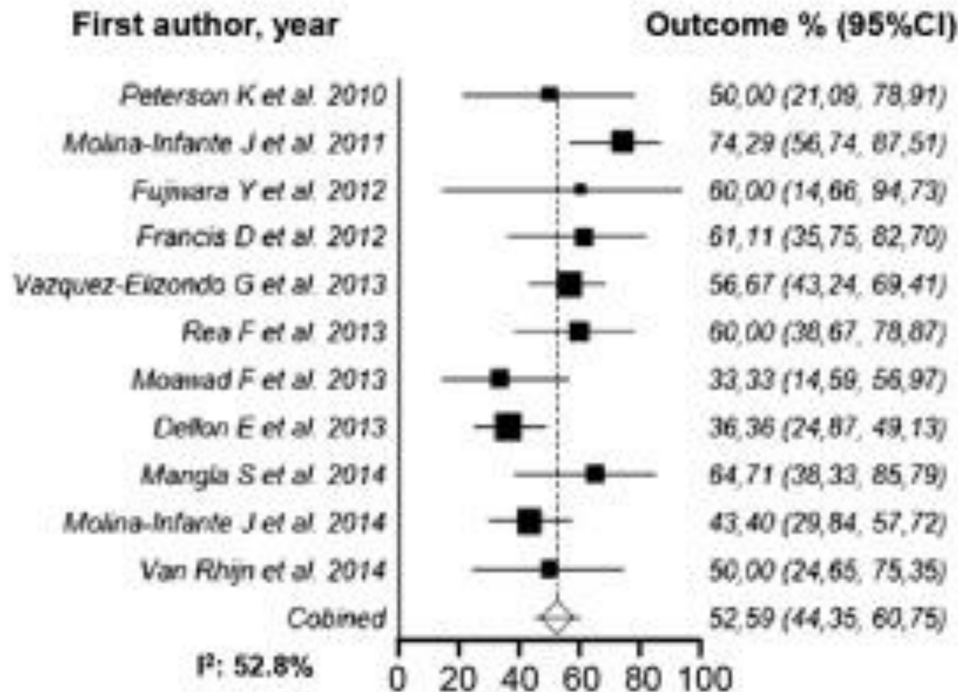
Therapeutic Options

EoE and EoG/EoD





PPI therapy (for EoE)



Prospective studies

Many small studies. One Meta-analysis (2016):

- 33 studies (188 children, 431 adults):
  - 60.8% clinical response.
  - 50.5% histologic remission.
- Prospective studies more effective than retrospective.
- Twice-daily PPIs more effective than once-daily.
- Rabeprazole may be warranted in patients who are rapid metabolizers of other PPIs

Potassium-Competitive Acid Blockers:

- Preliminary studies (e.g., vonoprazan) show similar efficacy to PPIs in EoE.
- 2-point reduction in EREFS
- Symptomatic response: 72.7%
- Complete histologic remission: 39.4%.
- PCABs likely to be studied further in EoE.

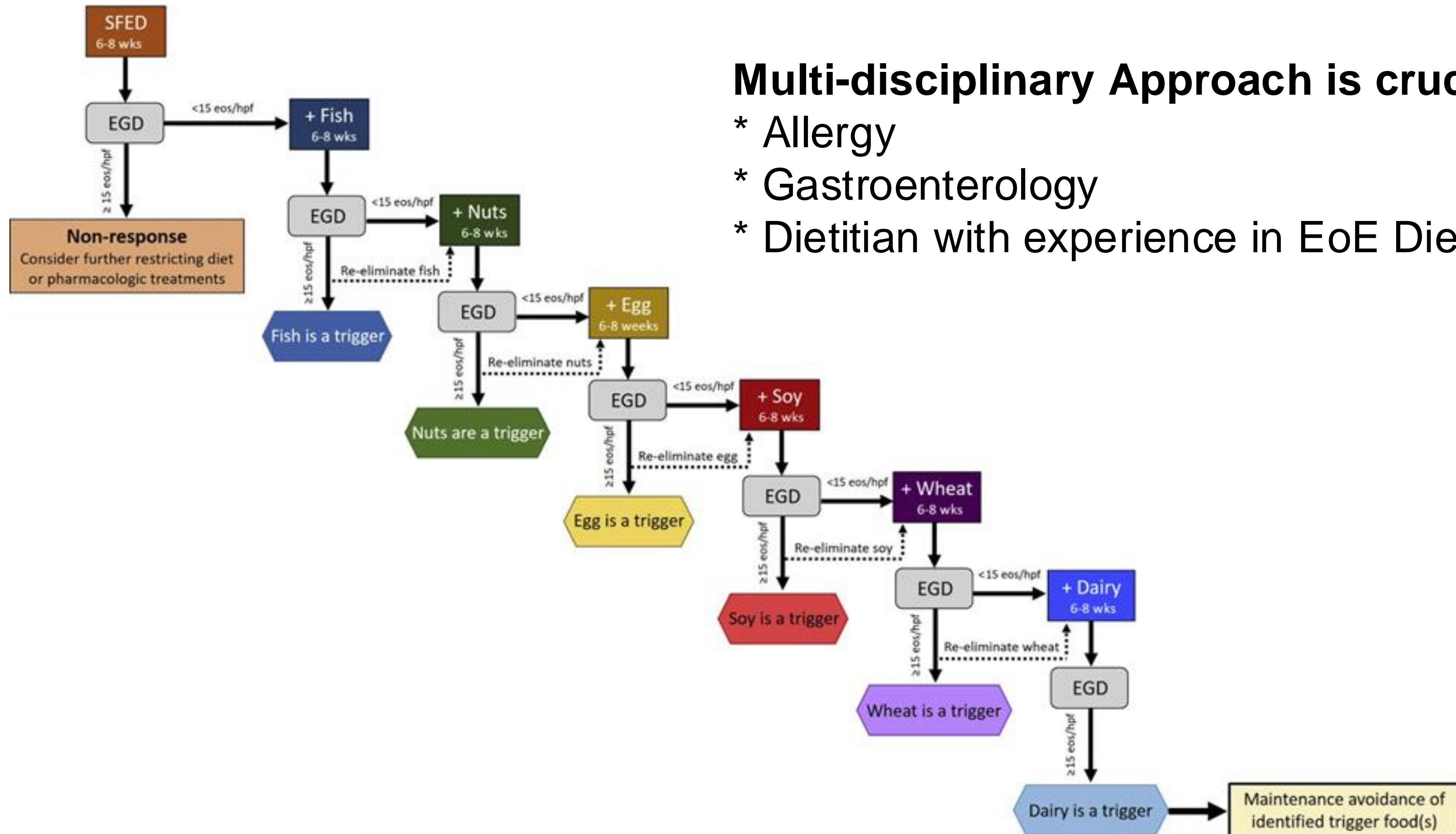
H2 Receptor Blockers:

- No efficacy data supporting use in EoE.

Dosing

- Pediatrics: 2mg/kg/day or 1mg/kg twice a day
- Adults: double the reflux dose e.g. omeprazole 20mg BID

Diet Implementation and Reintroduction



Multi-disciplinary Approach is crucial

* Allergy
* Gastroenterology
* Dietitian with experience in EoE Diets

Chang JW Gastroenterol Clin North Am 2021

Dietary treatment for EoG/EoN

(ELEMENT)

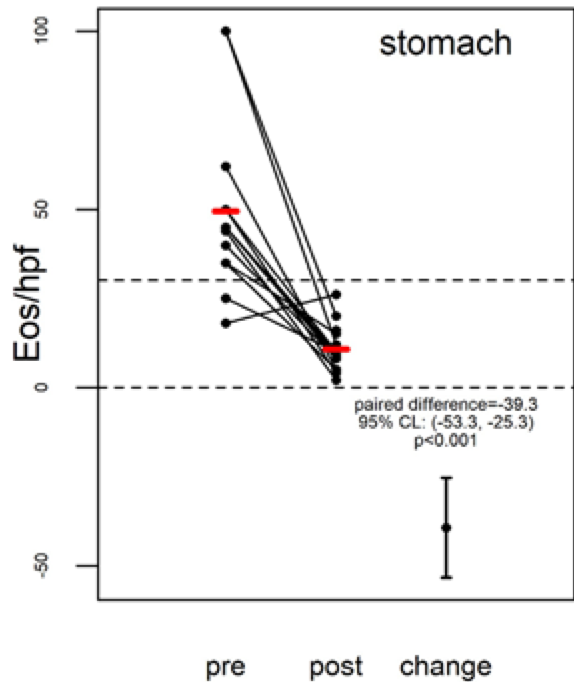
15 adults (18-65 years) with histologically active EG/EGE (≥ 30 eos/hpf) in stomach and/or duodenum

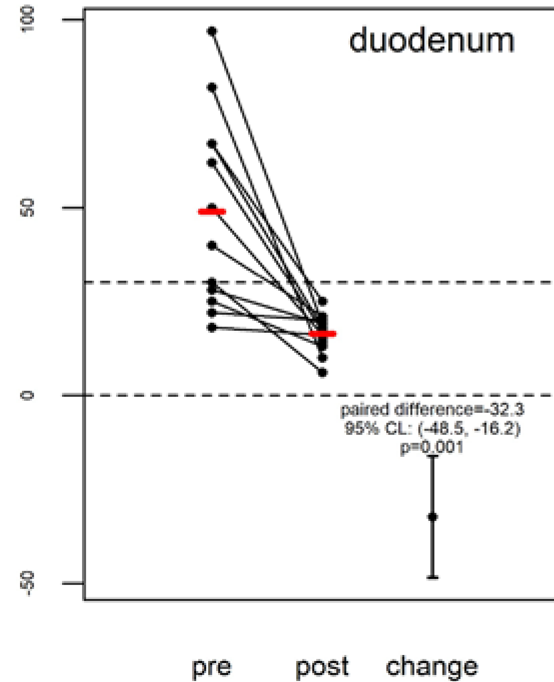
→

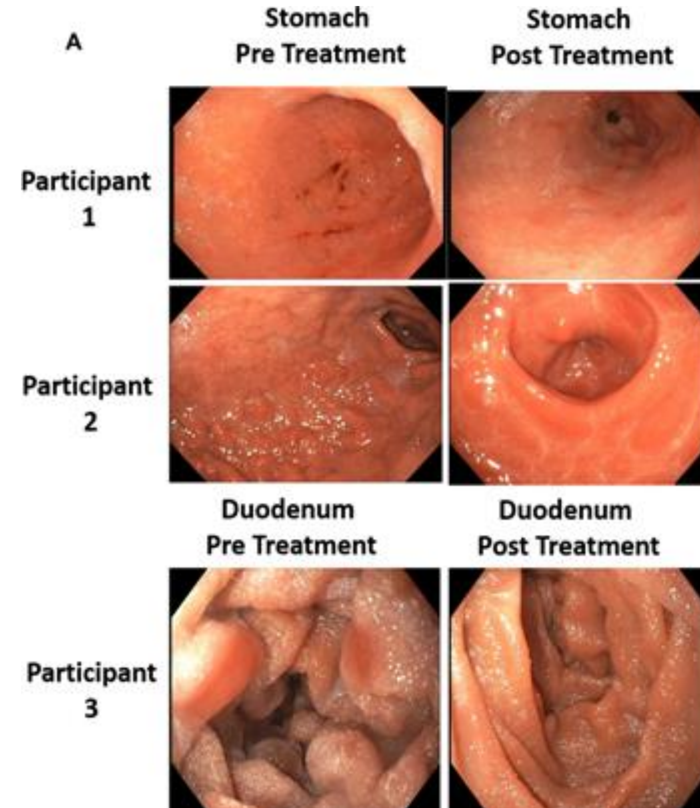
- GI symptoms ≤ 1 month prior to enrollment
- Treated with elemental diet for 6 weeks

→

Primary endpoint:
% of participants with complete histologic remission at end of treatment







Gonsalves et al JACI 2023

Topical Corticosteroids
EoE

History & Efficacy:

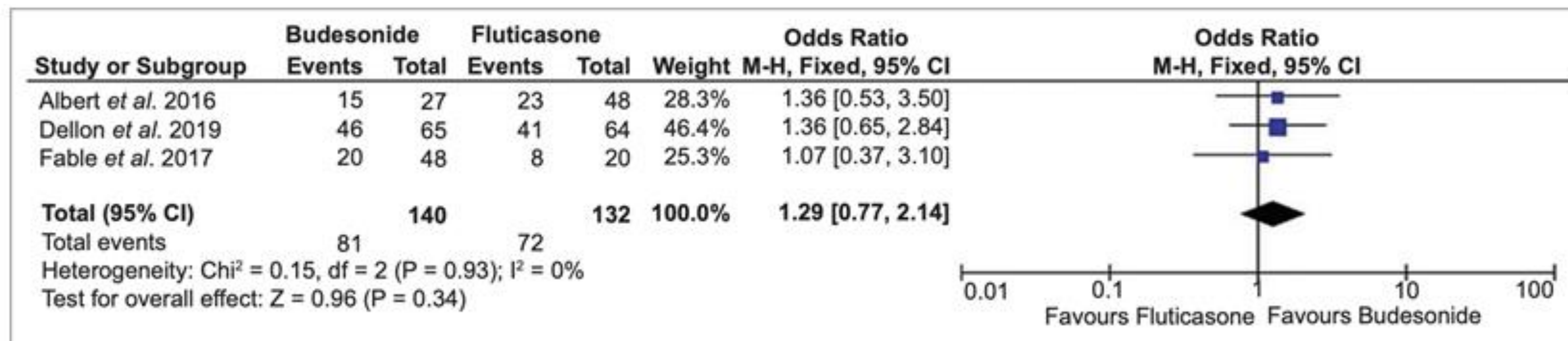
- First reported as effective in 1998 for pediatric EoE.
- Numerous studies (13+ RCTs) show histologic improvement (60-70% response rate).
- Recent Phase 3 trials report histologic response rates of 62%-95% with budesonide and fluticasone formulations.

Symptom Improvement:

- Variable symptom response due to different patient-reported outcomes (PROs) and study designs.
- Endoscopic improvement consistently reported in trials.

Safety Profile:

- Common side effects: oral/esophageal candidiasis (3.8%-23.7% incidence).
- Rare adrenal insufficiency (≤5%) with short-term use; more common with long-term use.



Study or Subgroup	Budesonide Events	Budesonide Total	Fluticasone Events	Fluticasone Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Albert *et al.* 2016	15	27	23	48	28.3%	1.36 [0.53, 3.50]
Dellon *et al.* 2019	46	65	41	64	46.4%	1.36 [0.65, 2.84]
Fable *et al.* 2017	20	48	8	20	25.3%	1.07 [0.37, 3.10]
Total (95% CI)		**140**		**132**	**100.0%**	**1.29 [0.77, 2.14]**
Total events	81		72			

Heterogeneity: $Chi^2 = 0.15$, df = 2 (P = 0.93); $I^2 = 0\%$
Test for overall effect: Z = 0.96 (P = 0.34)

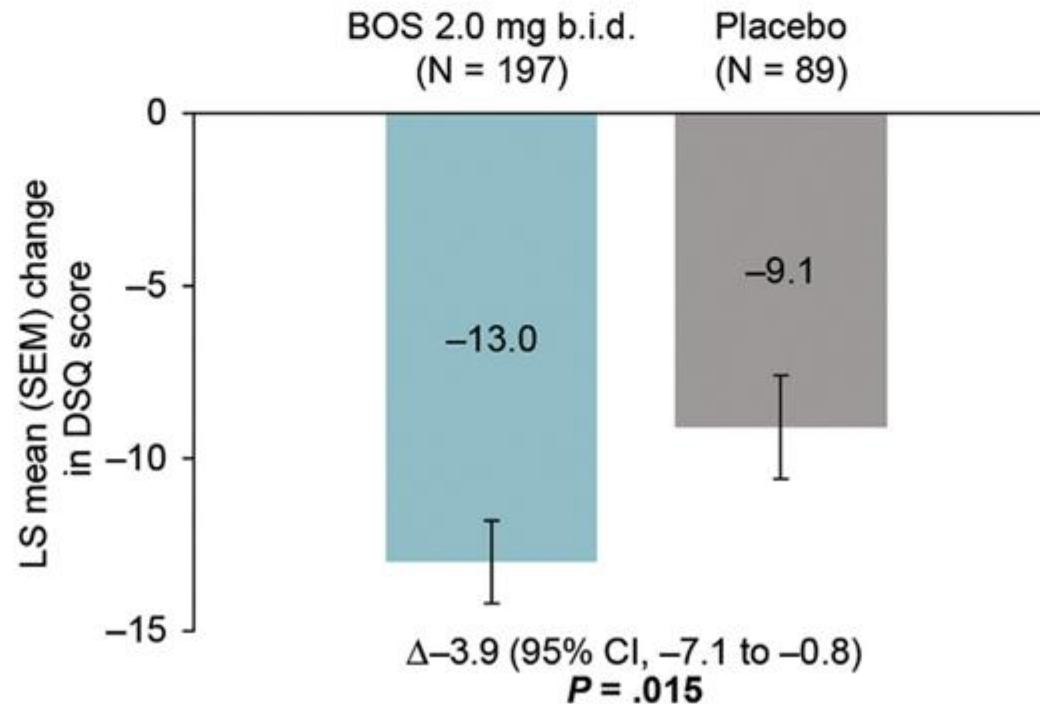
Numan L Annals of Gastroenterology (2023)

EoHELIA: oral budesonide suspension

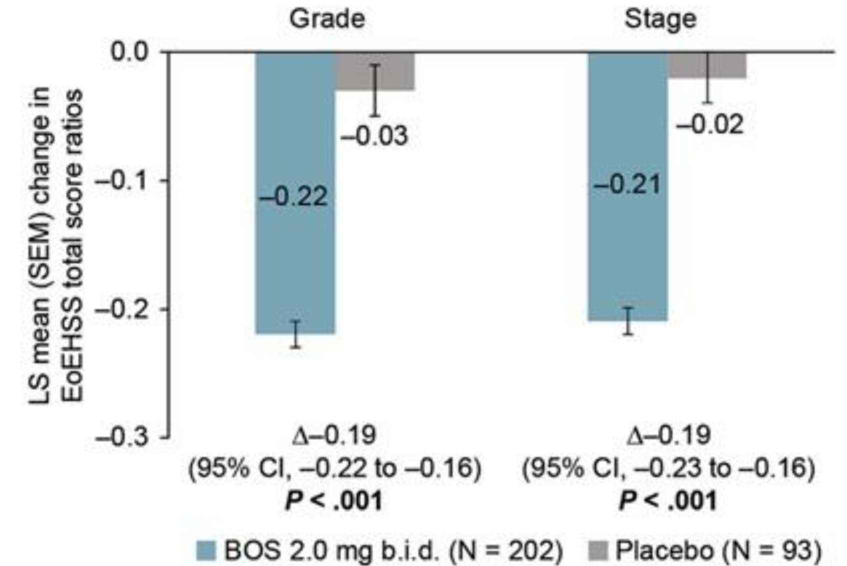
Budesonide Oral Suspension Improves Outcomes in Patients With Eosinophilic Esophagitis: Results From a Phase 3 Trial

Ikuo Hirano,* Margaret H. Collins,‡ David A. Katzka,§ Vincent A. Mukkada,|| Gary W. Falk,¶ Robin Morey,# Nirav K. Desai,** Lan Lan,# James Williams,** and Evan S. Dellon,‡‡ on behalf of the ORBIT1/SHP621-301 Investigators

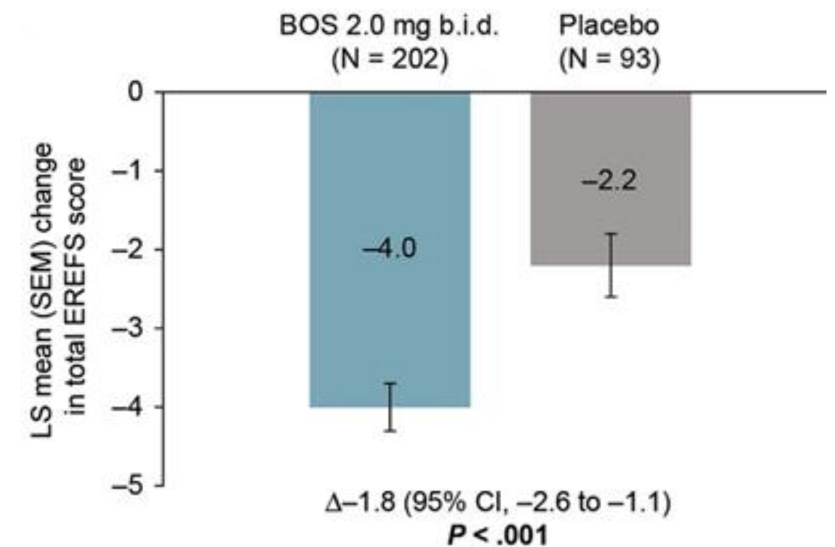
SYMPTOMS (DSQ)



HISTOLOGY

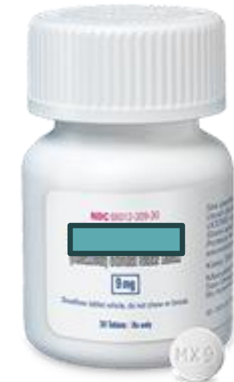


ENDOSCOPIC FEATURES



Systemic and TCS in EGIDs (off label tx)

- For EoG, enteral disease and colonic disease
  - Topical GC (budesonide slurry, delayed release budesonide, foams)
  - Systemic



Biologics (EoE)

- Omalizumab (anti-IgE) - not effective

- Mepolizumab / Reslizumab (anti-IL5)

  - 50% reduction in GI tissue eosinophils, little to no improvement in symptoms in placebo-controlled trials

Biologics: Dupilumab reduces dysphagia, esophageal eosinophilia and endoscopic activity in EoE (ph2)

Placebo   Dupilumab 300 mg qw

A
n/N = 14/10
n/N = 17/6
P = .0304
SDI PRO

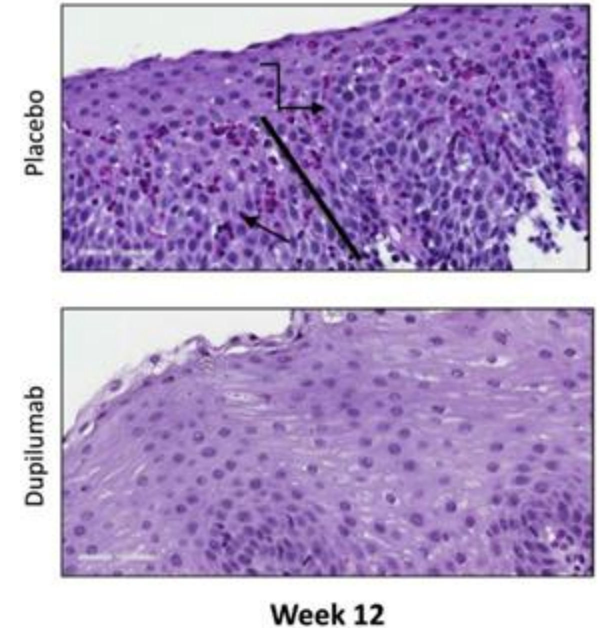
B
n/N = 22/2
n/N = 23/0
% Baseline peak eos/hpf

C
n/N = 22/2
n/N = 23/0
P = .0006
EREFS

D
n/N = 20/4
n/N = 22/1
P < .0001
EoE-HSS grade

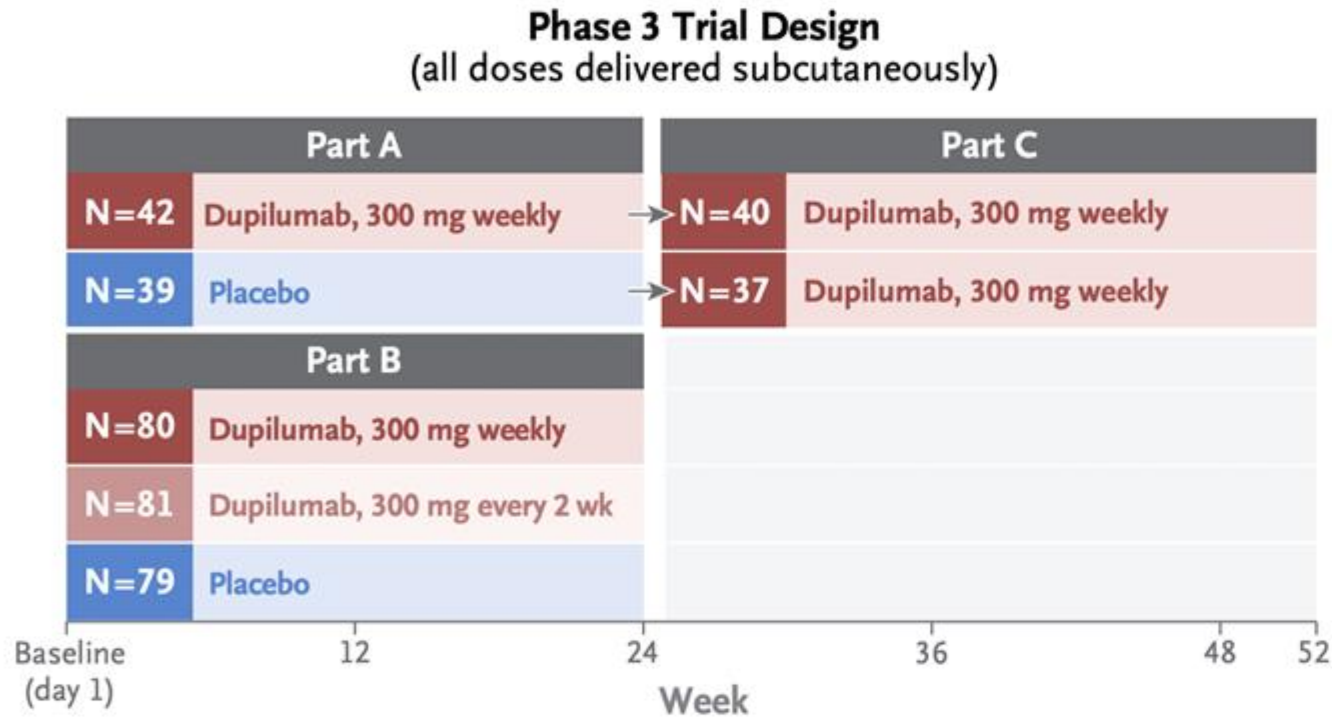
E
n/N = 20/4
n/N = 23/0
P < .0001
EoE-HSS stage

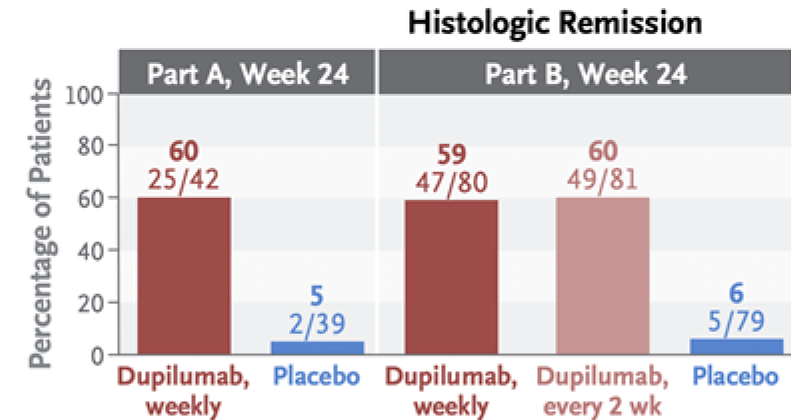
n/N = 12/12
n/N = 12/11
P < .0001
Distensibility

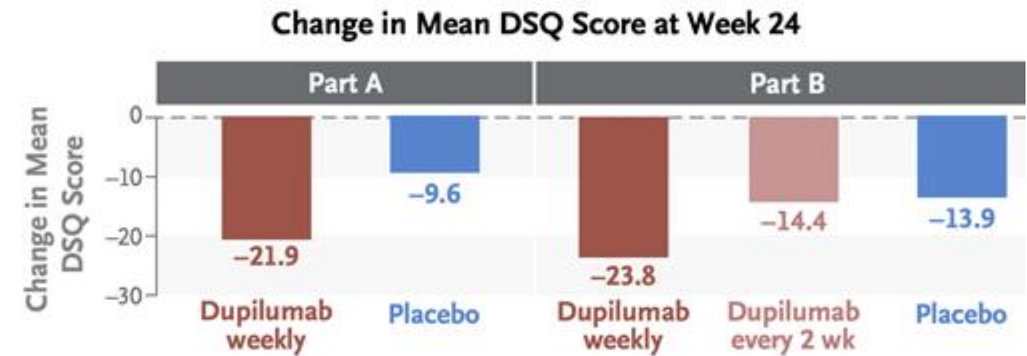


Hirano and Dellon Gastroenterology 2020

Dupilumab was effective for symptoms and histologic improvement in adults and adolescents (Ph3)



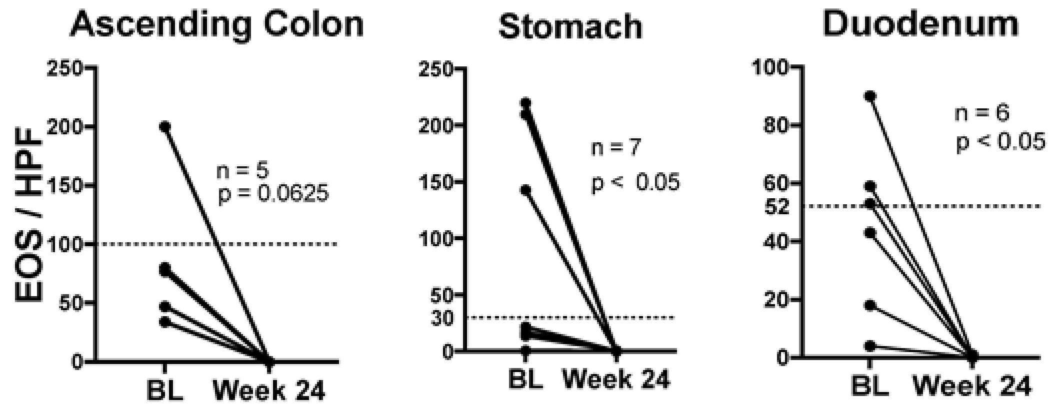




Dellon ES NEJM 2022

Mixed symptom results with Benralizumab (anti-IL5R) despite eosinophil tissue reduction

- Phase 2, Randomized, Double-Blind, Placebo-Controlled trial of benralizumab in **HES**
- Primary end-point: Reduction in AEC at 12 weeks,
- 7/20 enrolled patients had HES/EGID overlap

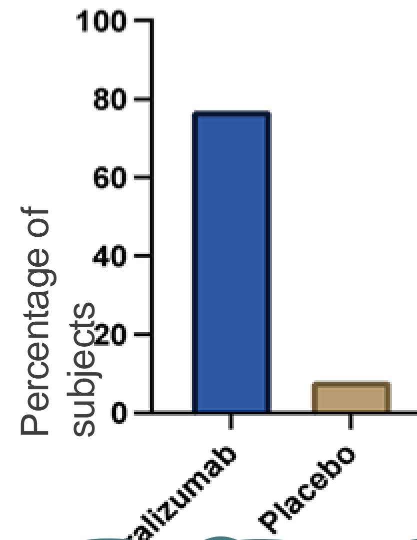


Kuang F JACI In Practice 2022; modified

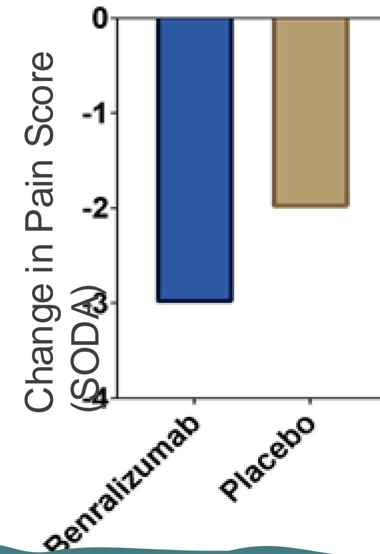
Phase 2, Randomized, Double-Blind, Placebo-Controlled of benralizumab in **EoG**

Primary end-point: Histologic remission < 30 eos/hpf

Histological Remission



EoG Symptoms



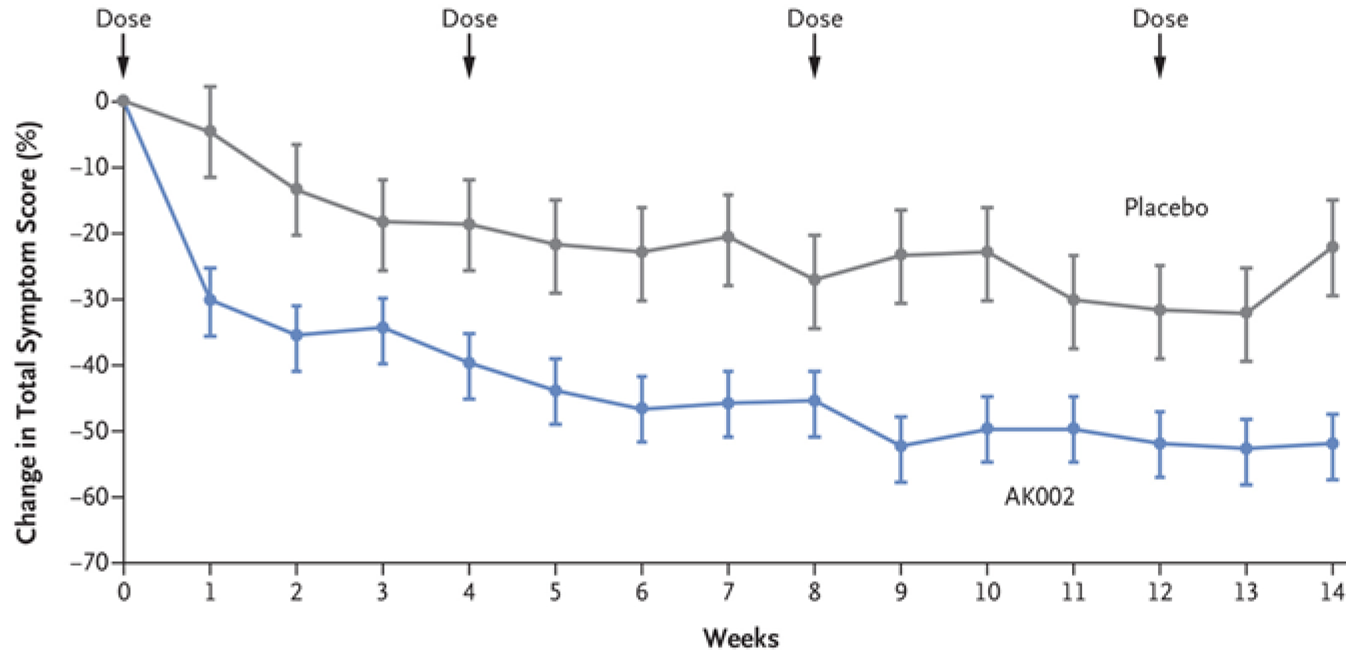
A Ph3 study (HUDSON-GI) for patients with EoG or EoN has completed enrollment (no results posted as of making these slides)

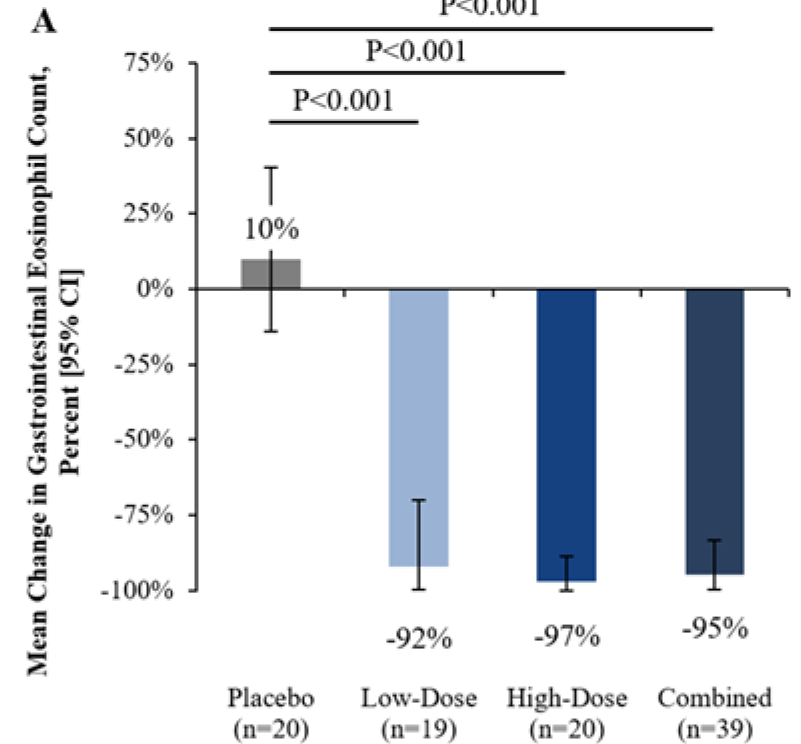
Patients with EoG/EoN treated with Lirentelimab experienced both reduced symptoms and tissue eosinophilia (ph2)

ORIGINAL ARTICLE

Anti–Siglec-8 Antibody for Eosinophilic Gastritis and Duodenitis

Evan S. Dellon, M.D., M.P.H., Kathryn A. Peterson, M.D., Joseph A. Murray, M.D., Gary W. Falk, M.D., Nirmala Gonsalves, M.D., Mirna Chehade, M.D., M.P.H., Robert M. Genta, M.D., John Leung, M.D., Paneez Khoury, M.D., Amy D. Klion, M.D., Sabine Hazan, M.D., Michael Vaezi, M.D., et al.





Ph3 study failed to show a difference in symptom improvement (large placebo response) despite histologic improvement.

Dellon et al NEJM 2020

Current EoE/EGID studies including non-T2 novel mechanisms

- Efficacy and Safety of CC-93538 (**Cendakimab, anti-IL13**; Celgene) in Adult and Adolescent EoE Recruiting
- Efficacy and safety of Barzolvolimab (**CDX-0159 mAb binding KIT,** Celldex), in adult EoE (EVOLVE) Recruiting
- Efficacy, Safety and Tolerability of IRL201104 (Revolo; **peptide derived from Chaperonin (TB)**) in Adults With Active EoE-Completed, no results posted
- **Anti-IL15** CALY-002 (CalypsoBio) Ph1 for EoE, not recruiting
- **Tezepelumab** in EoE (Phase 3; CROSSING) Recruiting
- Fluticasone Propionate Oral Disintegrating Tablet (APT-1011)
- Zemaira Eosinophilic Esophagitis Pilot Study (ZEEPS) (**Alpha 1-Trypsin Inhibitor**) Recruiting
- **Efficacy of Dupilumab on Facilitated Food Introduction** in Eosinophilic Esophagitis Recruiting
- **DEGAS** Dupilumab ph2 in EoG/EoD (CEGIR consortium) Completed, no results posted
- **ENGAGE** ongoing dupilumab ph3 in EoG/EoD (Regeneron) Recruiting

References for EoE Diagnosis and Management

Practice Parameter

Annals of Allergy and Immunology

AGA institute and the joint task force on allergy-immunology practice parameters clinical guidelines for the management of eosinophilic esophagitis

Ikuo Hirano[*]; Edmond S. Chan[†]; Matthew A. Rank[‡]; Rajiv N. Sharaf[§]; Neil H. Stollman[‖]; David R. Stukus[¶]; Kenneth Wang[#]; Matthew Greenhawt[**]; Yngve T. Falck-Ytter[††]; on behalf of the AGA Institute Clinical Guidelines Committee and the Joint Task Force on Allergy-Immunology Practice Parameters

Gastroenterology

Technical Review on the Management of Eosinophilic Esophagitis: A Report From the AGA Institute and the Joint Task Force on Allergy-Immunology Practice Parameters

Matthew A. Rank,[1] Rajiv N. Sharaf,[2] Glenn T. Furuta,[3] Seema S. Aceves,[4] Matthew Greenhawt,[5] Jonathan M. Spergel,[6] Yngve T. Falck-Ytter,[7] and Evan S. Dellon;[8] on behalf of the AGA Institute and the Joint Task Force on Allergy-Immunology Practice Parameters collaborators

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- **Paneez Khoury**
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Laboratory of Allergic Disease

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Bryan Curtin (NIDDK)

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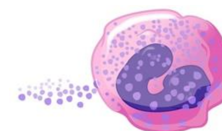
Martha Quezado (Pathology)
Stefania Pittaluga (Pathology)

AAAAI 2024 : Around the Horn on EoE / EGID

K23AI171085



QUESTIONS?

Slides: Biorender