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**AN INNOVATIVE MUCOSAL IMPEDANCE DEVICE
DIFFERENTIATES ACTIVE EOSINOPHILIC
ESOPHAGITIS FROM INACTIVE DISEASE, NERD,
AND CONTROLS**

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Disclosures


- Vanderbilt Institutional Review Board approved this study
- Vanderbilt University holds the patent with Sandhill Scientific Inc. for the device
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- The other authors of this study have no financial disclosures

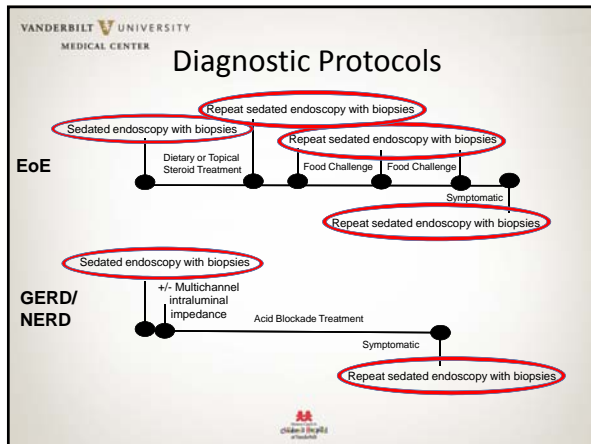


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Background

- Eosinophilic esophagitis (**EoE**), gastroesophageal reflux disease (**GERD**), and non-erosive esophageal reflux disease (**NERD**) are common diseases of both adult and pediatric patients
- Share clinical and histological features
- Require multiple endoscopies with biopsies or pH-impedance monitoring





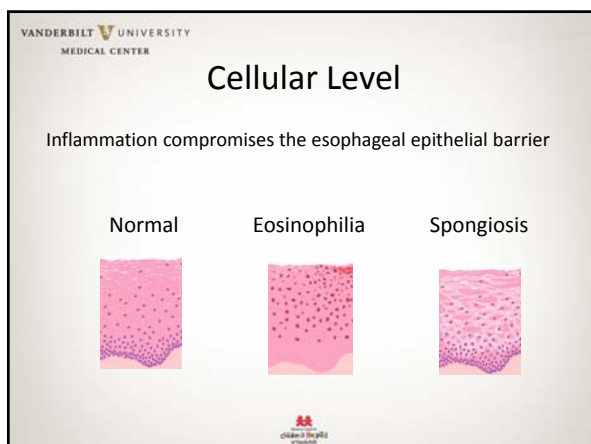
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Introduction

There is a need for an accurate means of diagnosing chronic mucosal changes due to EoE, GERD, and NERD

- **Timely**
- **Inexpensive**
- **Reduced Risks**

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Mucosal Impedance (MI) Device

MI is a measurement of current across the epithelium which can distinguish normal vs inflamed mucosa

Validated by adult studies

- Focused on GERD
- No histologic confirmation




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Hypothesis


We hypothesize that mucosal impedance measurement in pediatric patients will differentiate **historically**-proven **active EoE** from **inactive EoE**, **GERD/NERD**, and **normal**.



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Secondary Hypothesis

We hypothesize that **higher eosinophil counts** and more severe degrees of **spongiosis** will have **decreased electrical impedance** compared to **normal histology**.



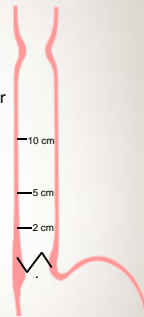
Methods

- Cross Sectional Study
- 83 pediatric patients
- Ages 1 year -18 years
- Vanderbilt Pediatric Gastroenterology Clinic



Methods

- MI measurements (in Ω)
 - Endoscopic placement
 - 2 cm , 5 cm and 10 cm above the squamocolumnar junction
 - Provide instantaneous measurements

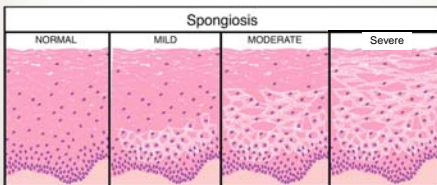


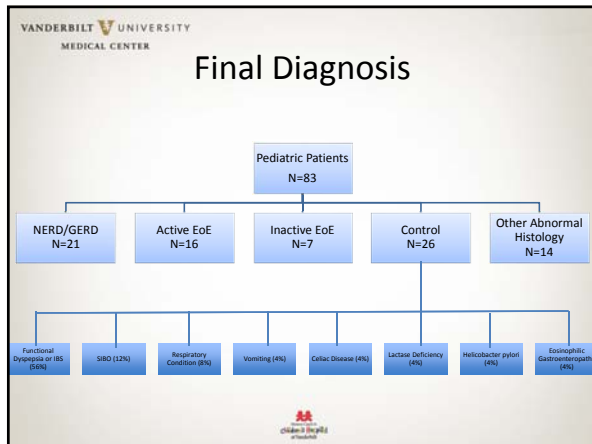
- Routine biopsies
 - 2 cm, 5 cm and 10 cm above the squamocolumnar junction



Methods

- Pathologists blinded to MI measurements reviewed biopsies per routine protocol
- Spongiosis was graded on an ordinal visual scale (normal, mild, moderate or severe).





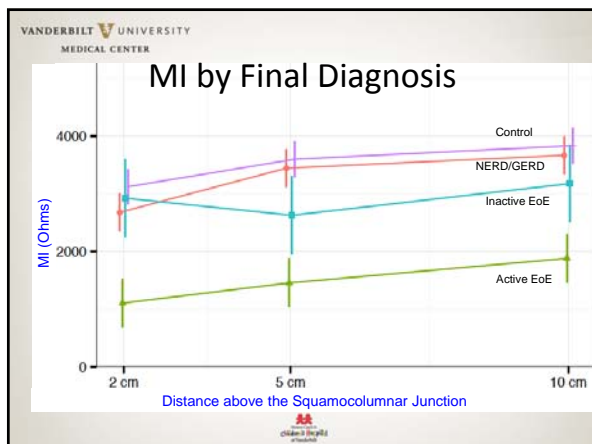
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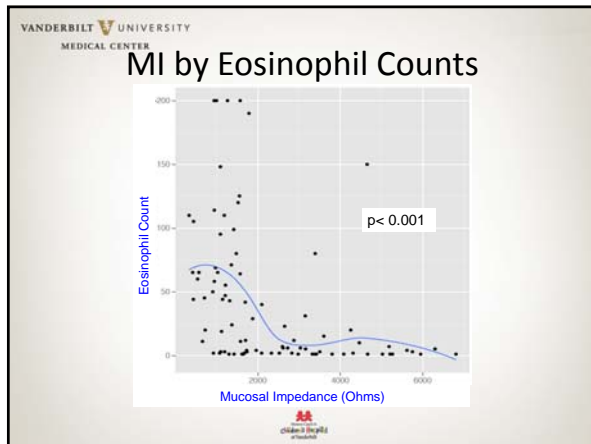
MI by Final Diagnosis

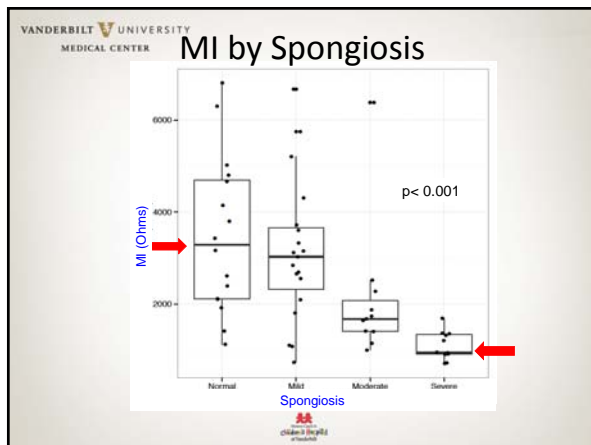
	N	Active EoE			Inactive EoE			NERD/GERD			Control			P-value
2 cm	83	655	1089	1316	1674	3242	4083	1683	2612	3249	2005	3091	4036	< 0.001
5 cm	82	973	1212	1415	2278	2682	2979	2104	2970	4863	2599	3532	4268	< 0.001
10 cm	83	1024	1572	1874	2389	2396	3382	1972	3820	4948	2895	3633	4987	0.002

a b c represent the lower quartile a, the median b, and the upper quartile c for continuous variables. N is the number of non-missing values.

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Conclusions

- 1) MI measurements provide immediate results of esophageal mucosal inflammation in pediatric patients.
- 2) Active EoE patients have significantly lower MI measurements than other patients.
- 3) MI measurements inversely correlate with eosinophil counts and spongiosis severity.
- 4) This novel device has the potential to provide immediate, less invasive disease monitoring in pediatric patients with EoE, thus significantly reducing costs and risks of repeated endoscopic evaluation.

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