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2024 Nebraska Asthma Conference

In Memory of Fred Kiechel M.D.

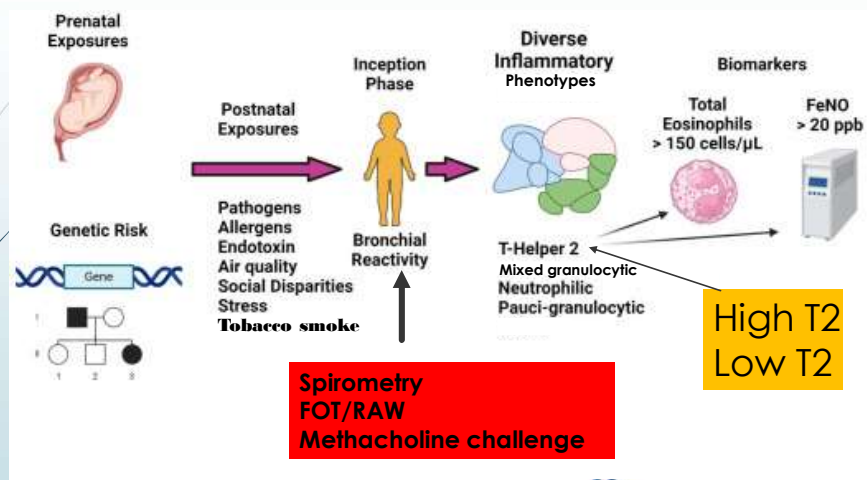


Russell J Hopp, D.O. FAAP, FAAAAI
Professor of Pediatrics
UNMC and Children's Hospital and Medical Center

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Specialized Testing in Pediatric (and Adult) Asthma

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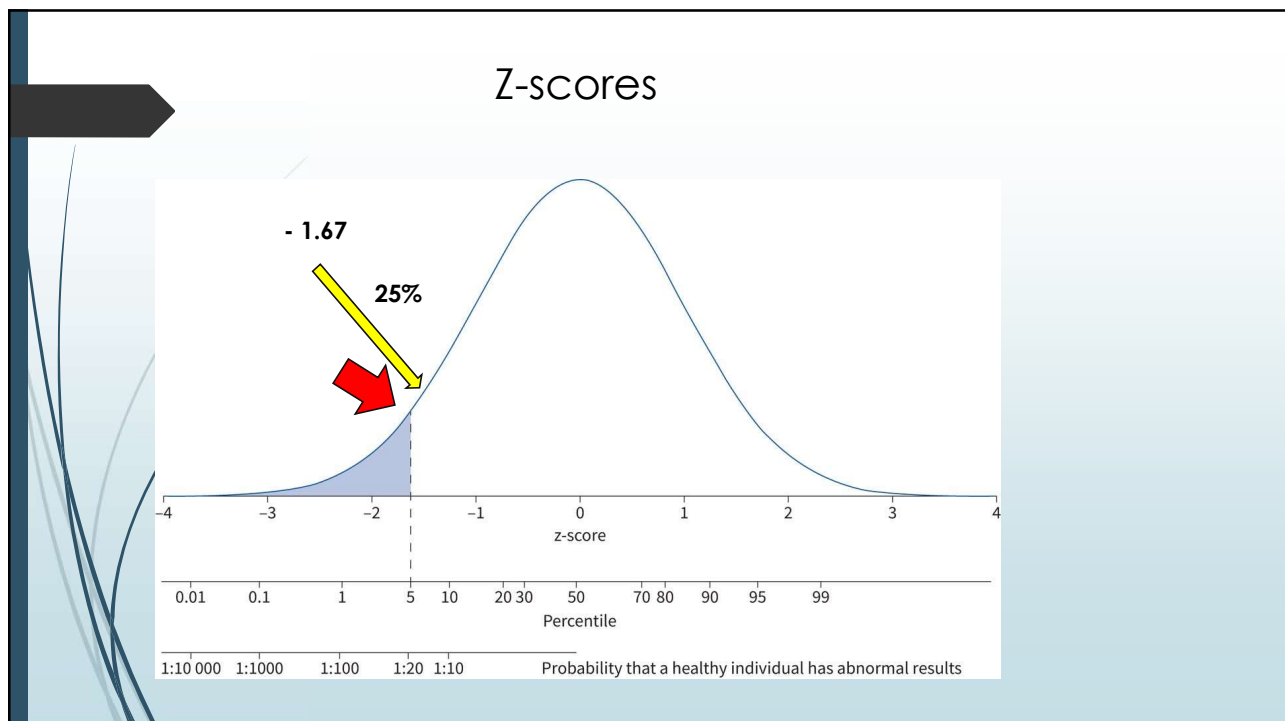


JACI July 2024

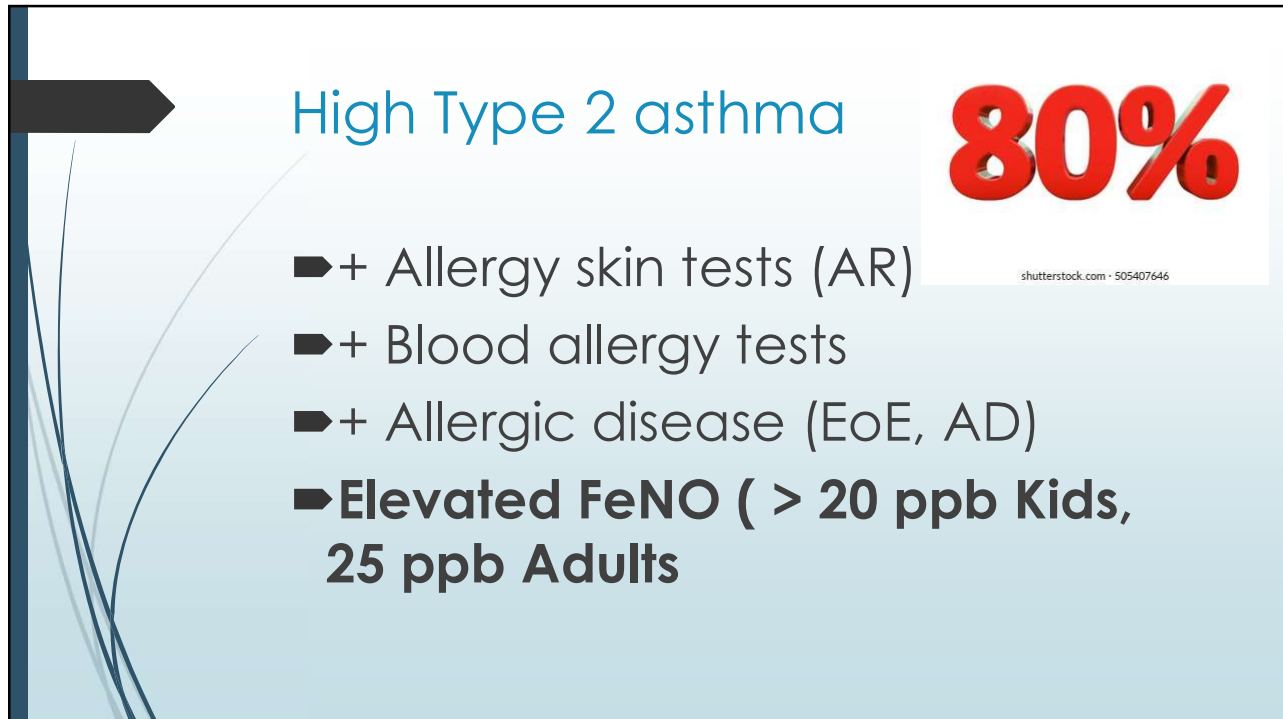
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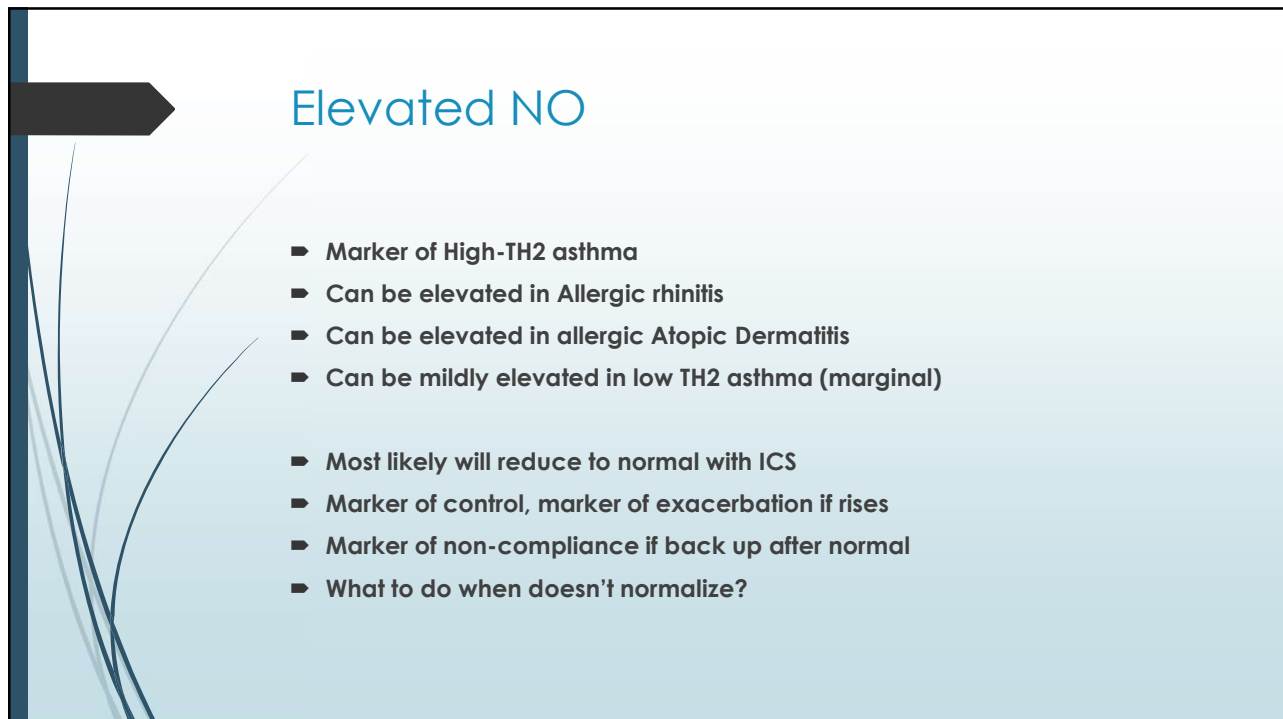
High Type 2 asthma

80%

- + Allergy skin tests (AR)
- + Blood allergy tests
- + Allergic disease (EoE, AD)
- **Elevated FeNO (> 20 ppb Kids, 25 ppb Adults)**

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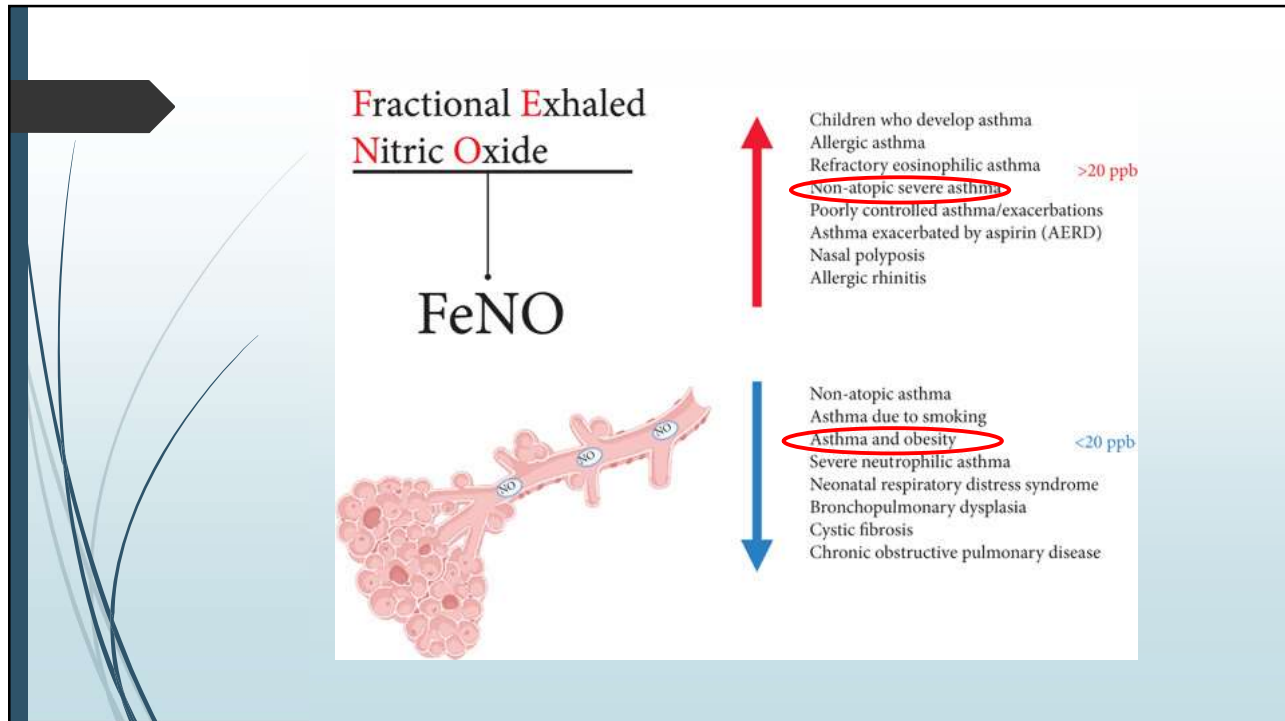


Elevated NO

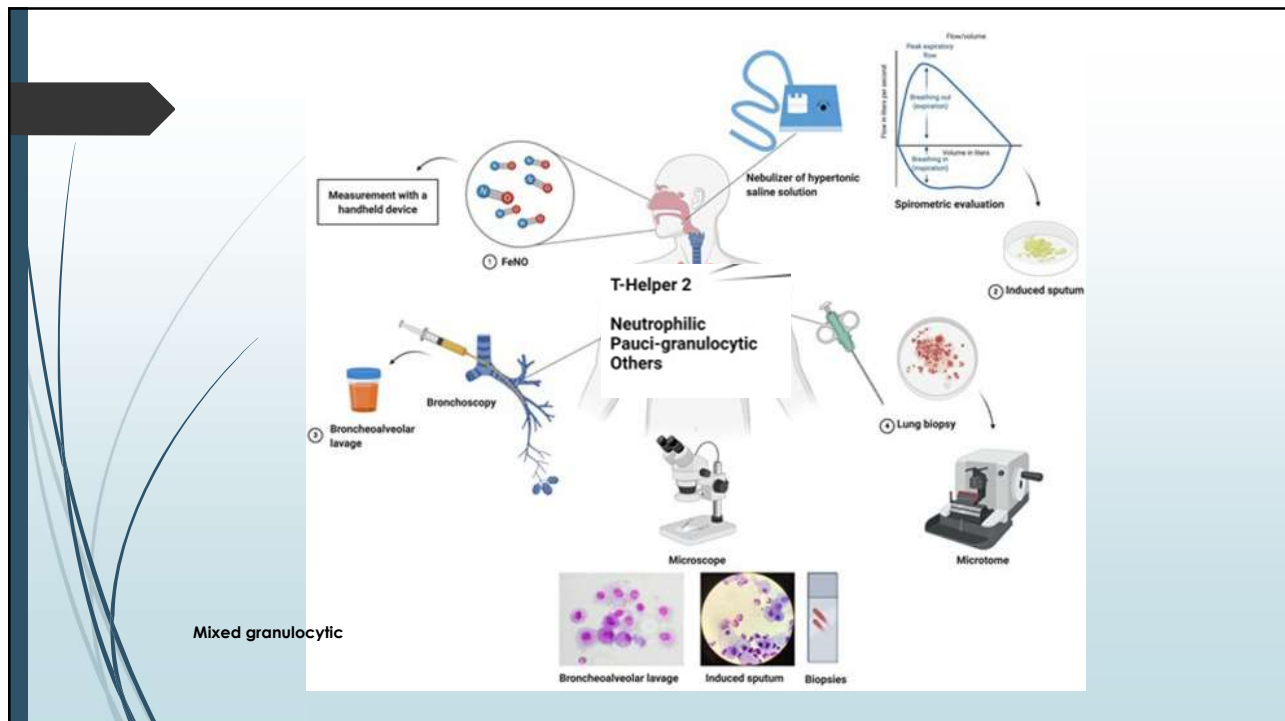
- Marker of High-TH2 asthma
- Can be elevated in Allergic rhinitis
- Can be elevated in allergic Atopic Dermatitis
- Can be mildly elevated in low TH2 asthma (marginal)

- Most likely will reduce to normal with ICS
- Marker of control, marker of exacerbation if rises
- Marker of non-compliance if back up after normal
- What to do when doesn't normalize?

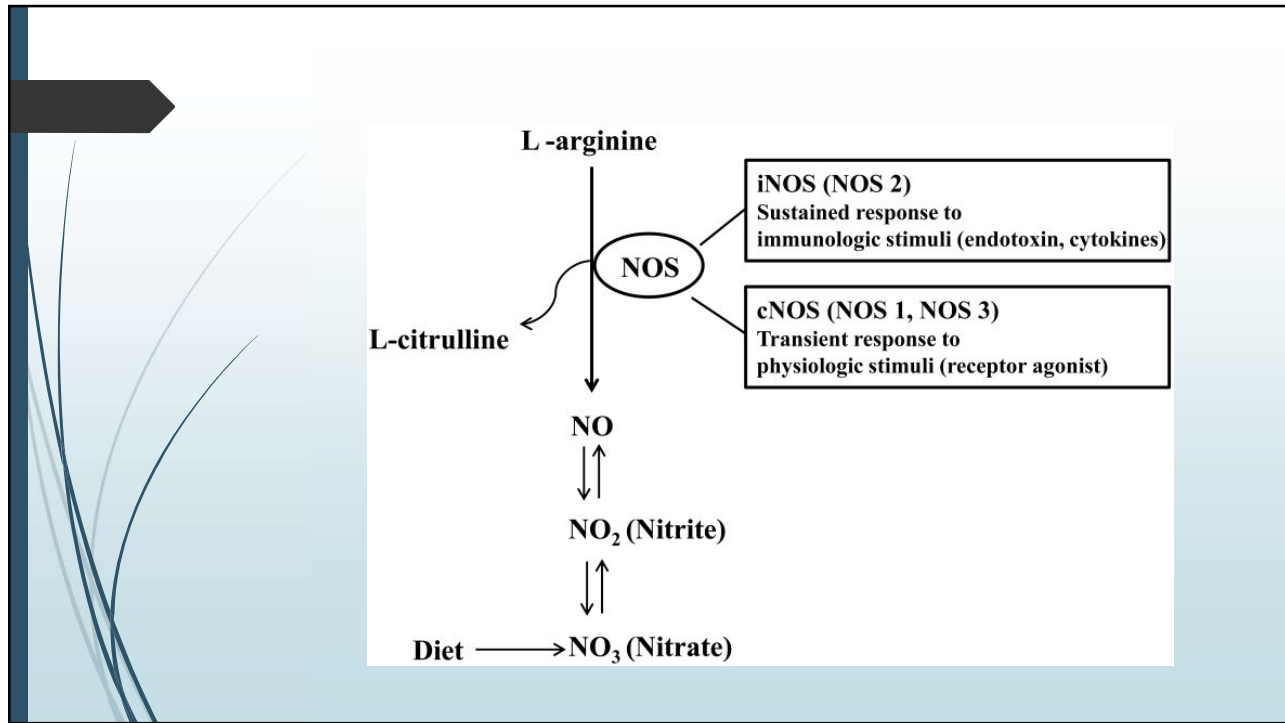
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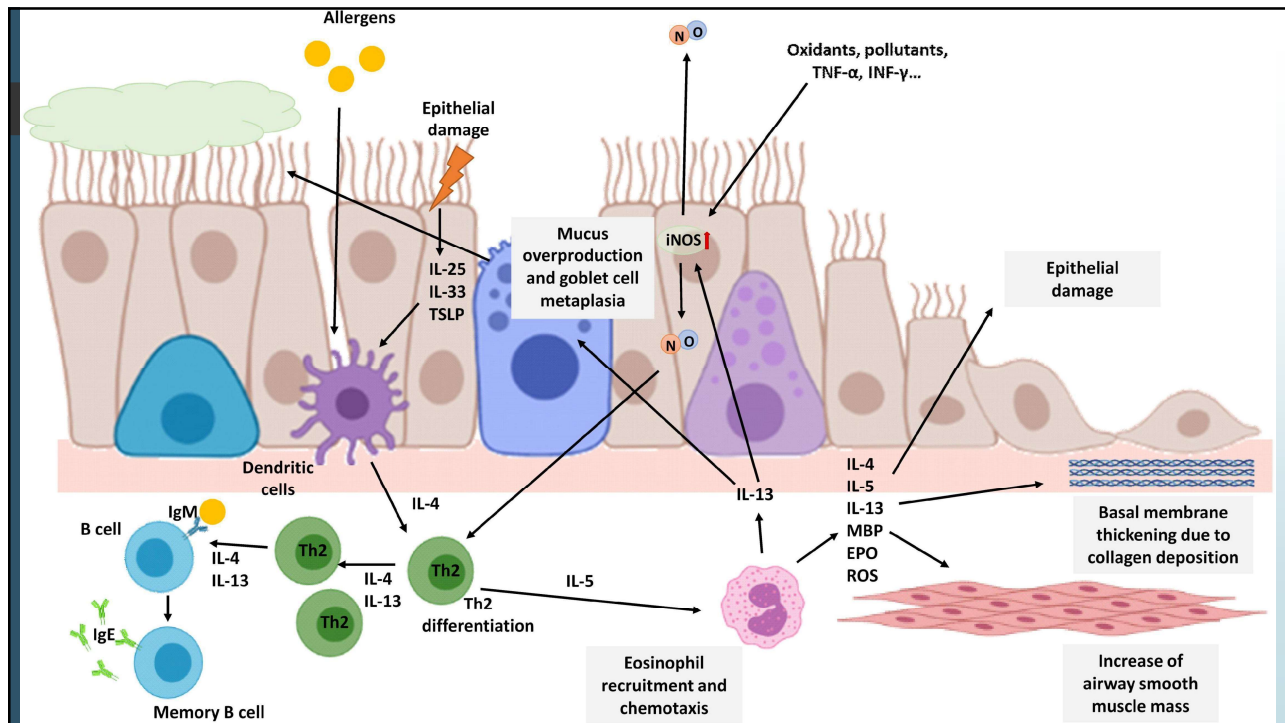
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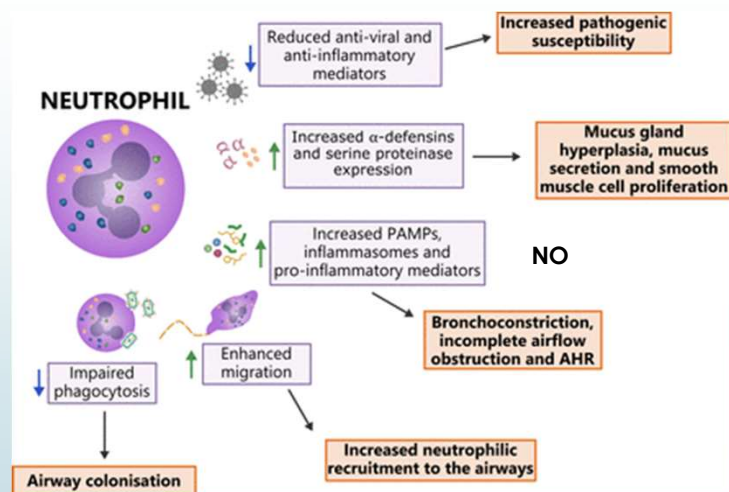


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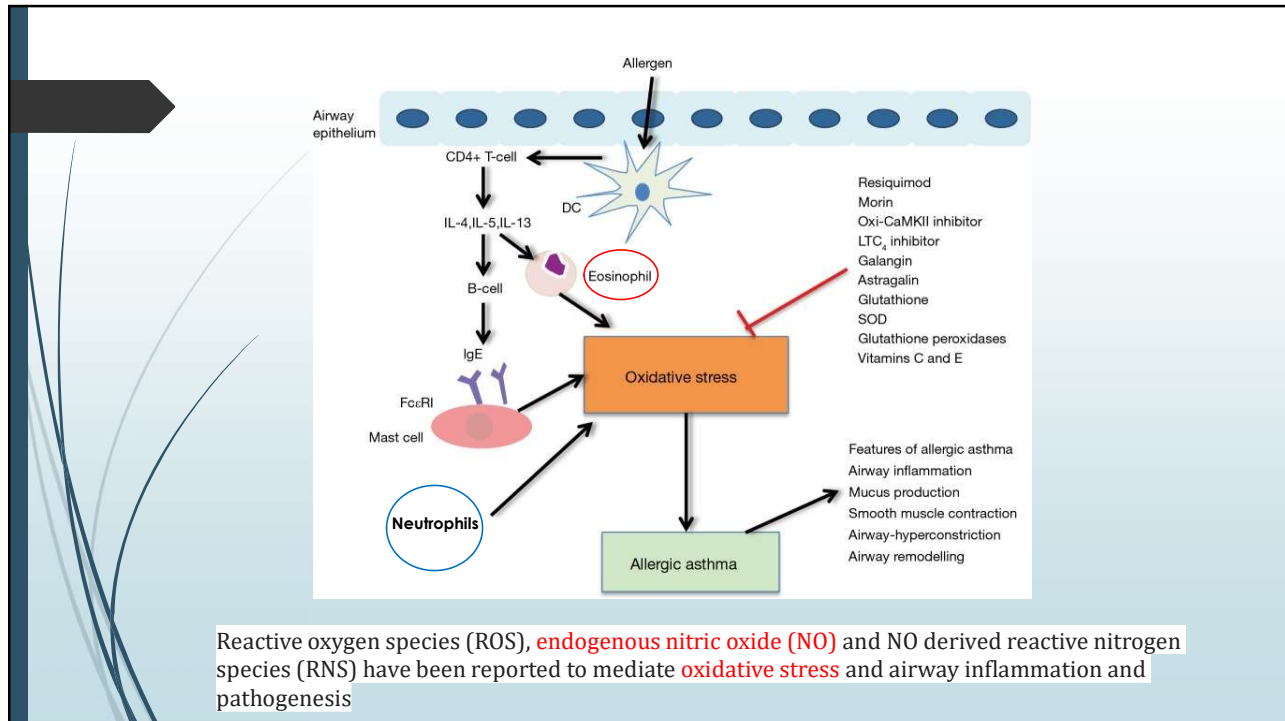
Although much effort has been made to identify iNOS as the main source of NO in allergic asthma, it has recently been demonstrated that it is also produced by neutrophils independently of any NOS. This finding widens the understanding of allergic asthma as well as its possible treatments

Chacon, Vega-Rioja, Doukkali, et al.: NO-linked ET. Formation by Neutrophils in Allergic Asthma. 2024, AJRCCM

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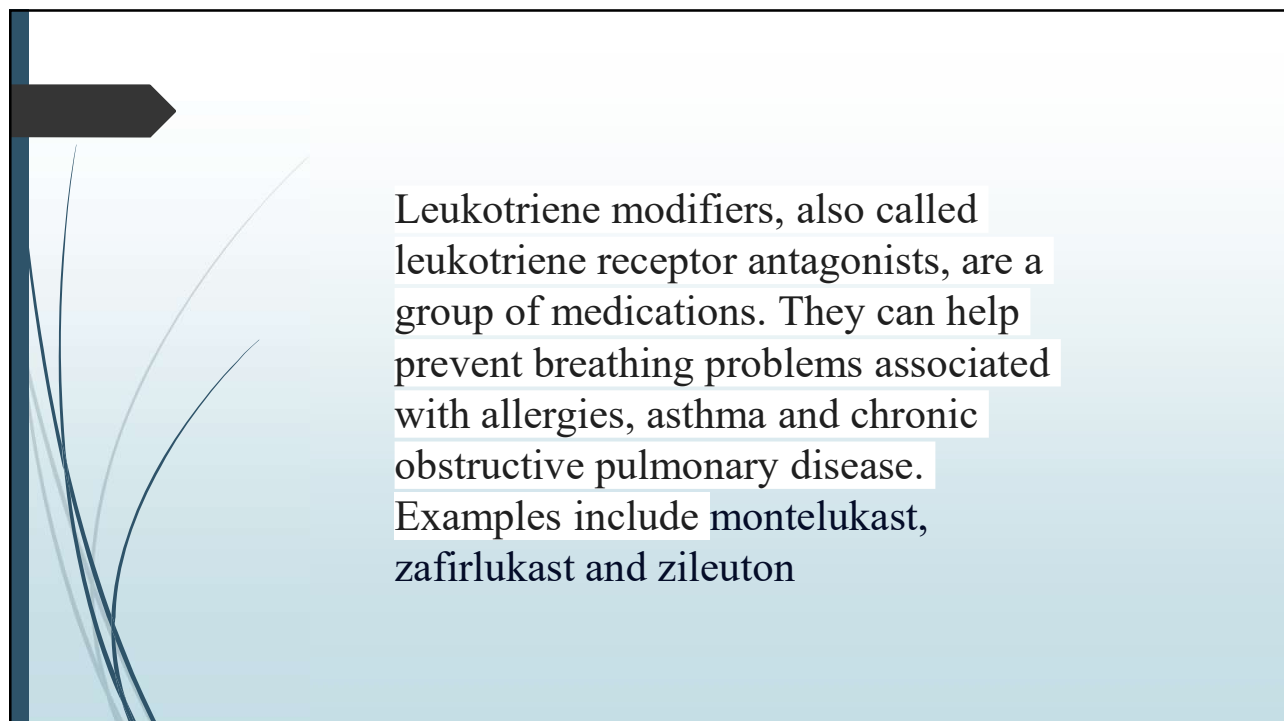
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High Initial NO

Higher-post ICS NO

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Leukotriene modifiers, also called leukotriene receptor antagonists, are a group of medications. They can help prevent breathing problems associated with allergies, asthma and chronic obstructive pulmonary disease. Examples include montelukast, zafirlukast and zileuton

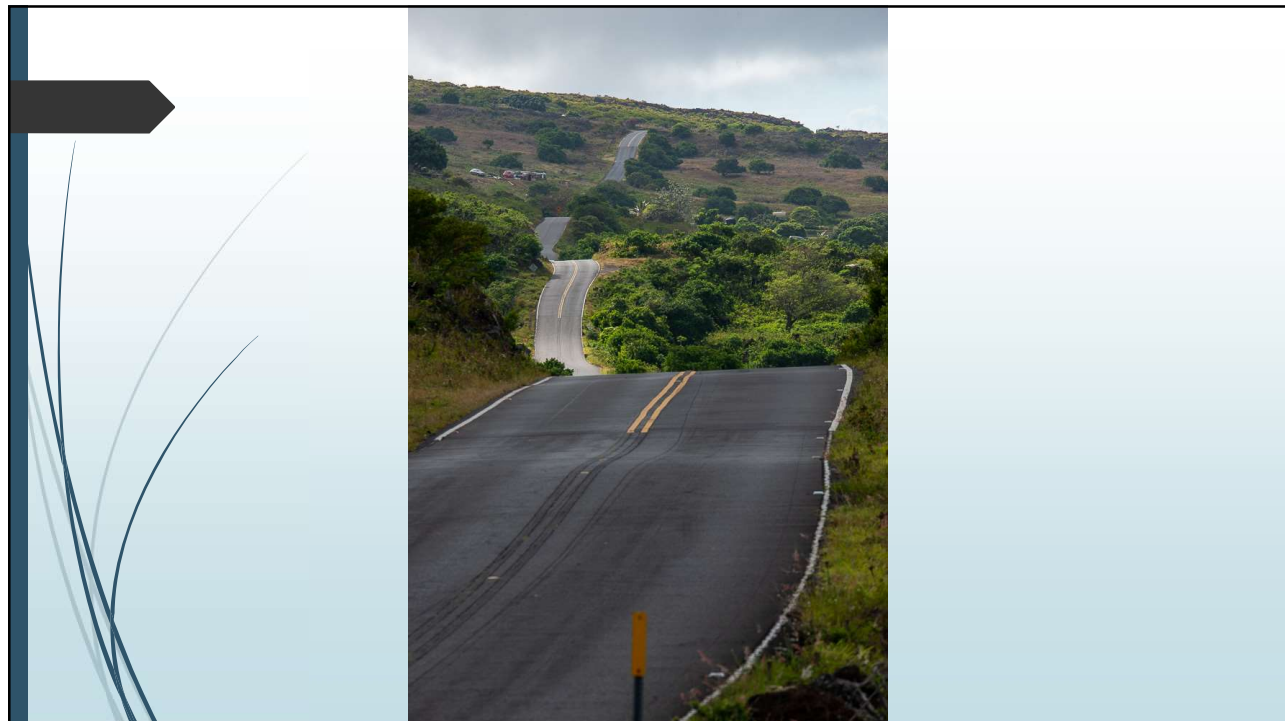
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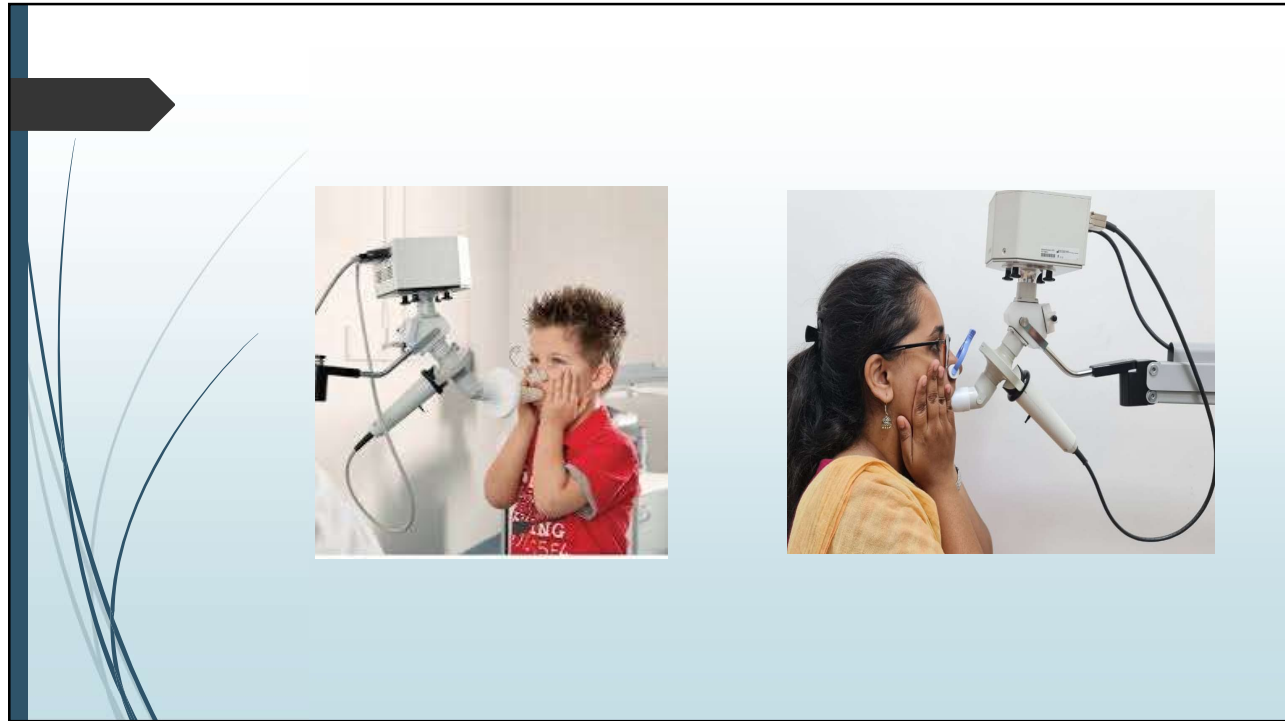
95012
FeNO Monitoring CPT/HCPCS Code

The image shows a purple handheld device with a screen and a white mouthpiece, used for FeNO monitoring. To its right is a purple graphic of human lungs with a white circle containing the text 'FeNO' above it.

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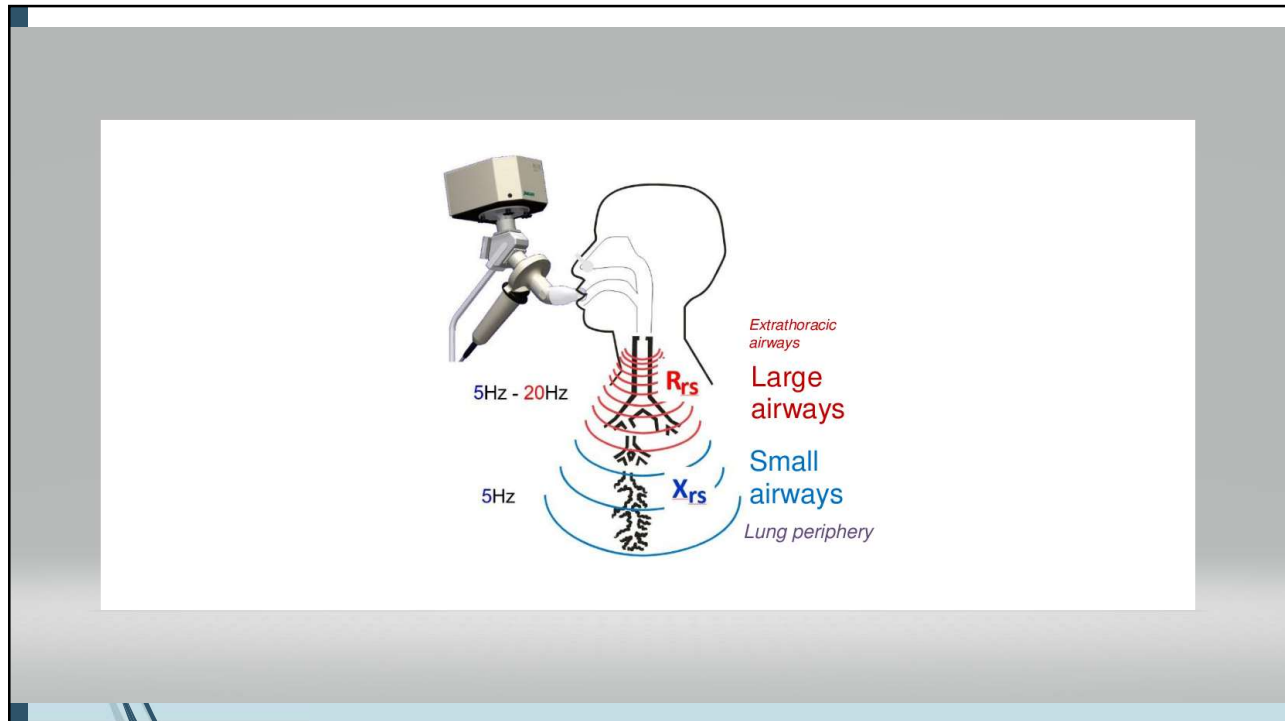


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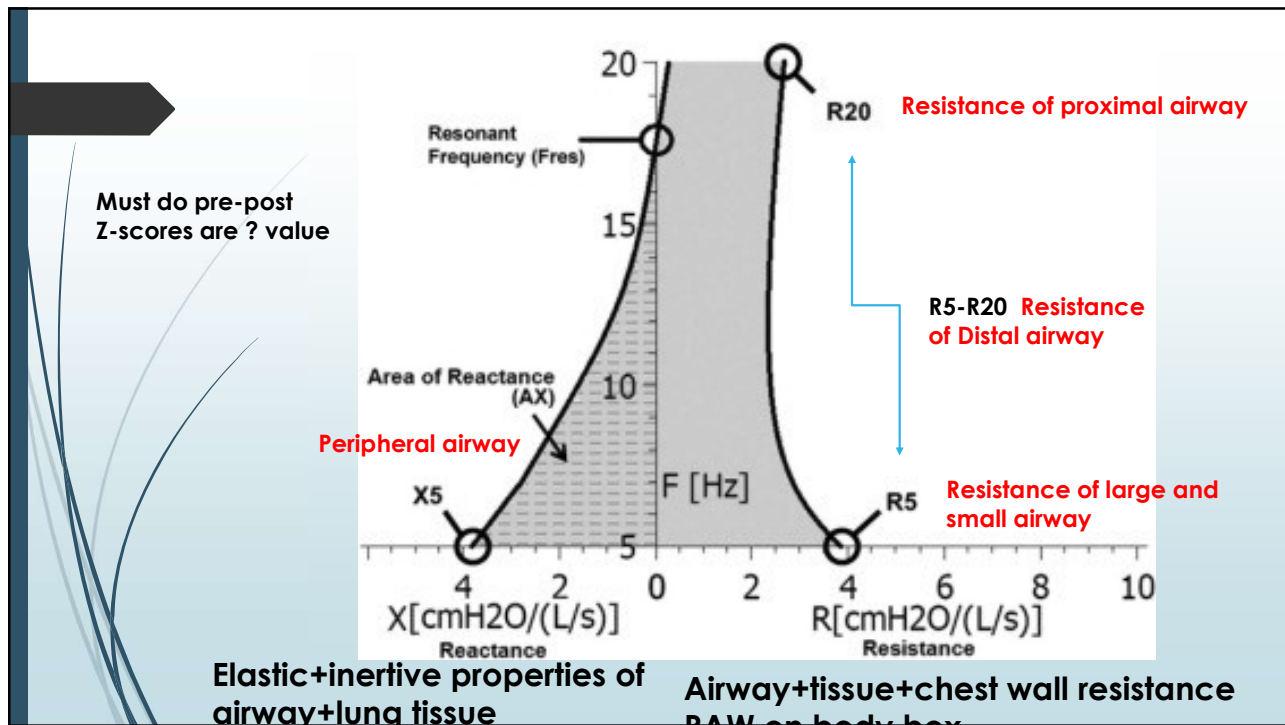
FOT (Impulse Oscillometry)

IOS works by superimposing sound waves on a patient's normal breathing. The disturbances in pressure and flow caused by the sound waves are then used to calculate parameters that describe the resistance to airflow and the lung's ability to store and return energy.

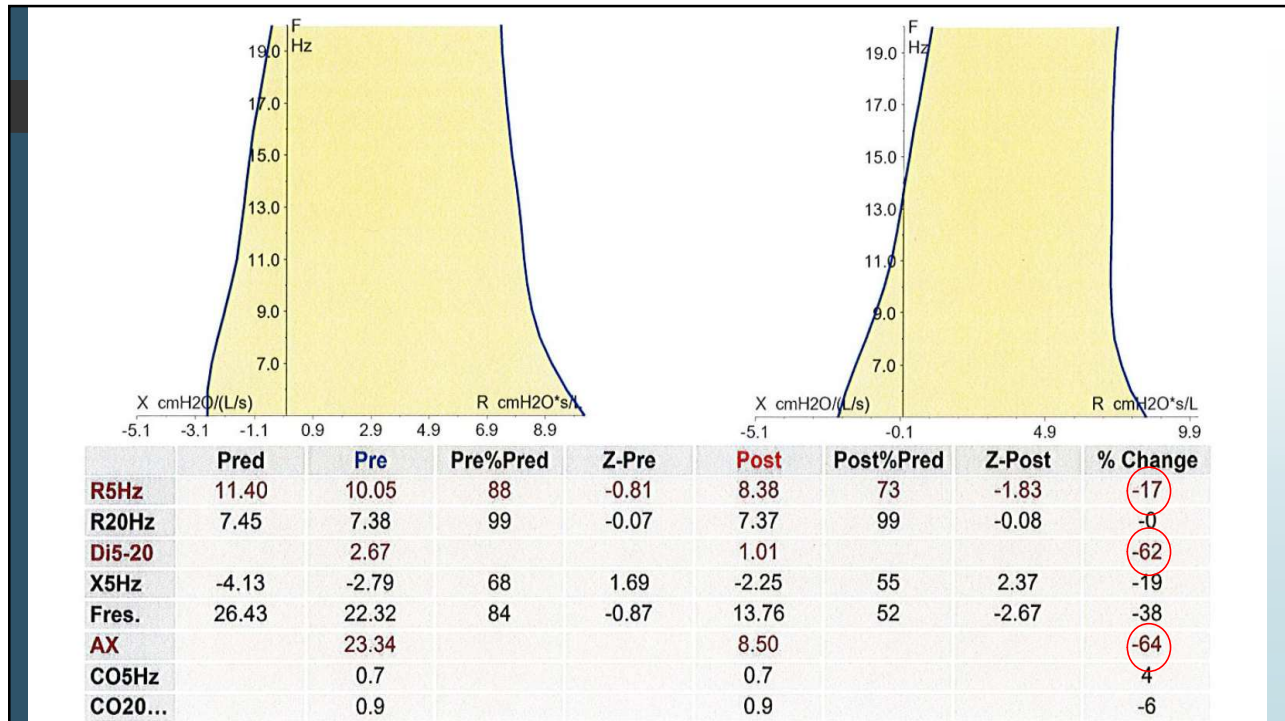
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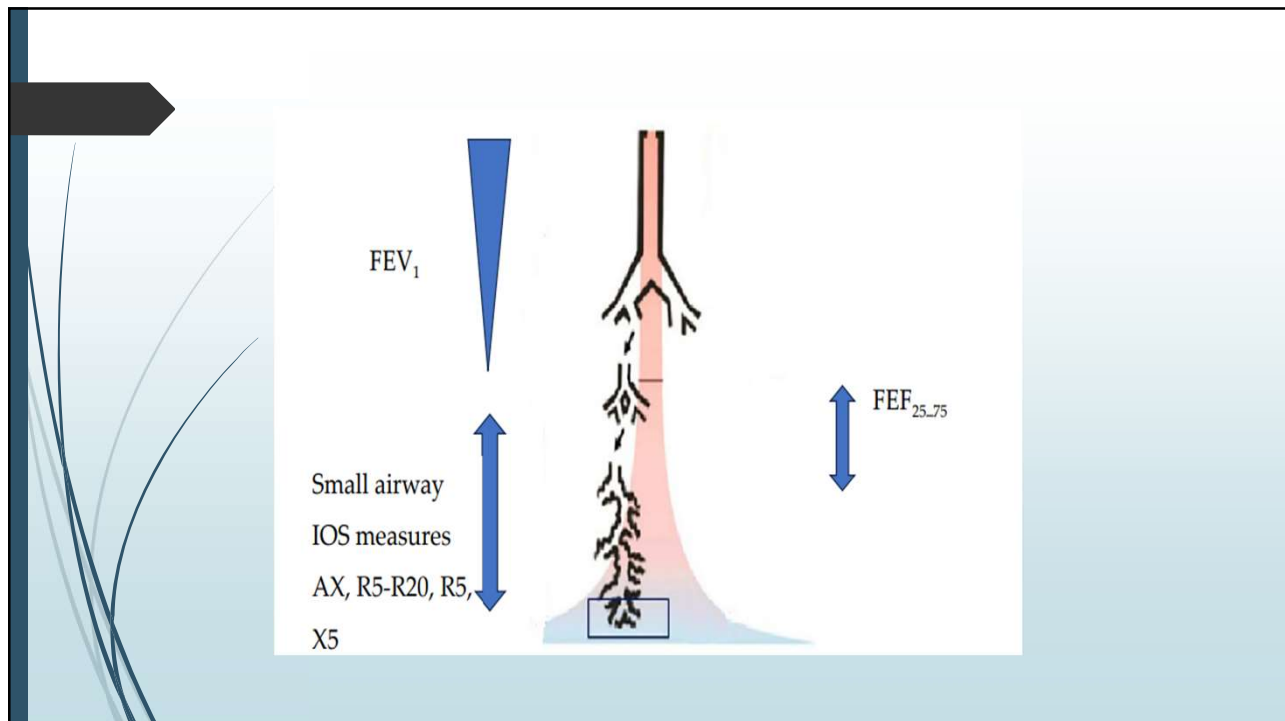
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Asthma Care in **2024** and Beyond

- ▶ Spirometry at every baseline with a pre-post
- ▶ Repeat as needed/severity
- ▶ FeNO at baseline and as needed
- ▶ IOS/RAW referral for younger children and if unable to do PFT

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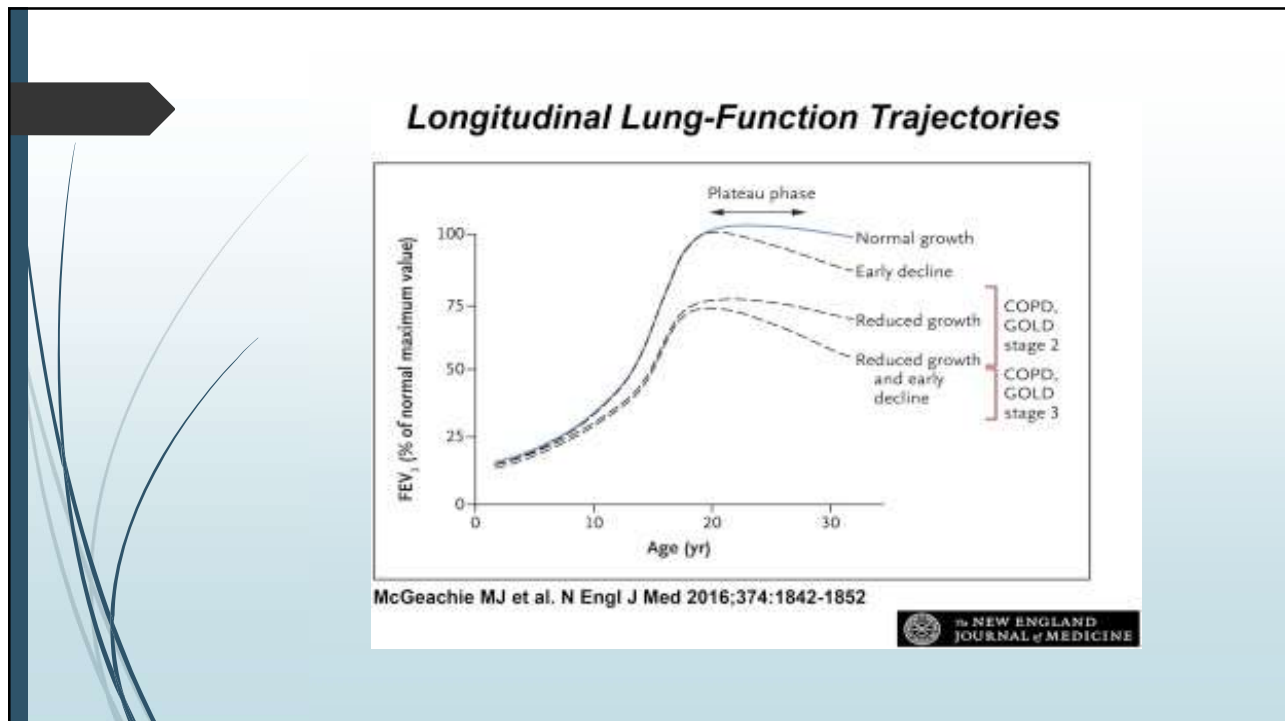


Questions

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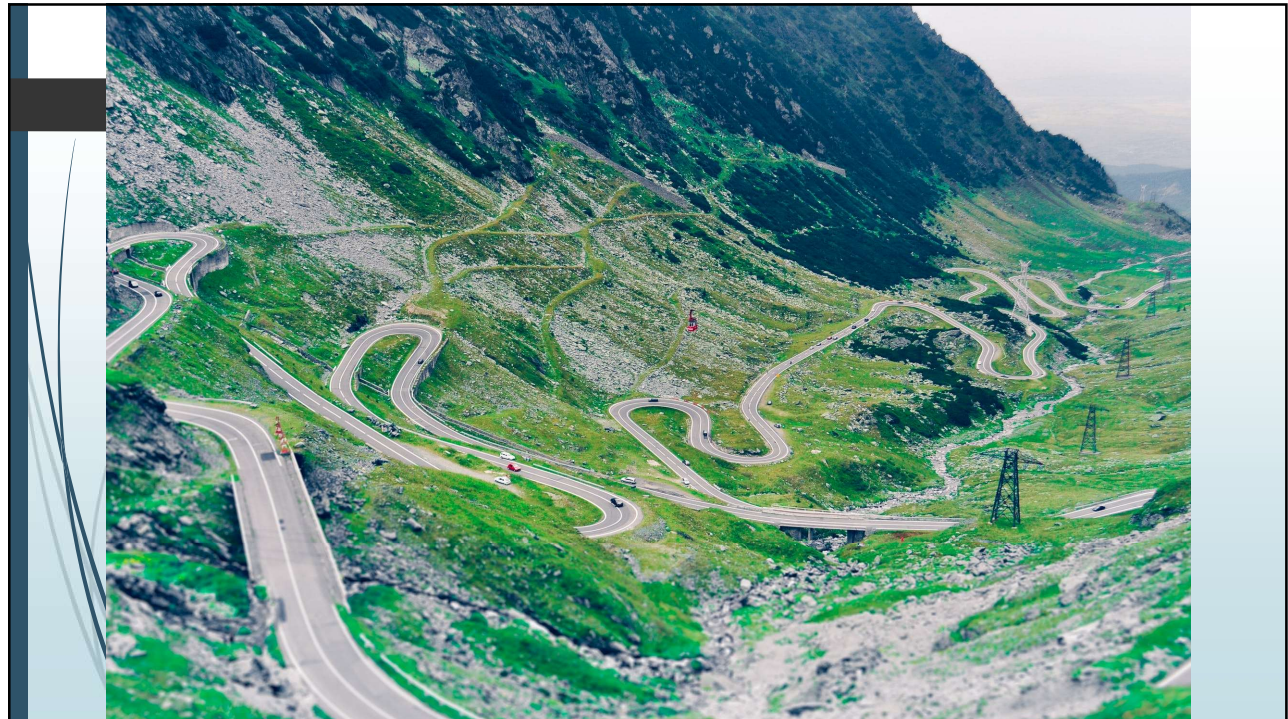


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Pulmonary Function in Children and Adults

- ▶ Graham BL et al **Standardization of Spirometry 2019 Update. An Official American Thoracic Society and European Respiratory Society Technical Statement.** Am J Respir Crit Care Med. 2019 Oct 15;200(8):e70-e88. doi: 10.1164/rccm.201908-1590ST. PMID: 31613151; PMCID: PMC6794117.
- ▶ Expiratory time (minimum of one second plateau)*
- ▶ FEV1 % predicted improvement: 10% *
- ▶ Z-scores
- ▶ GLI **GLOBAL** standards

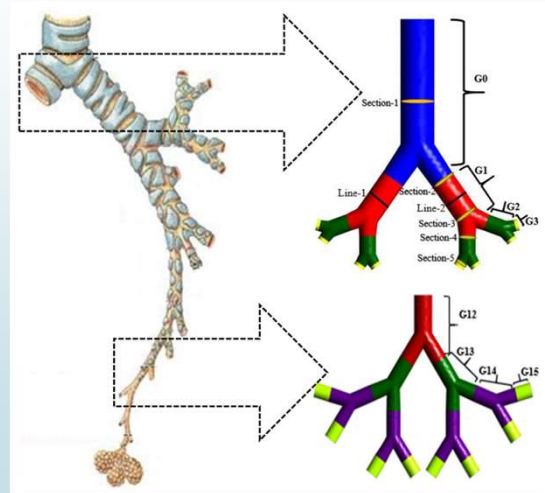
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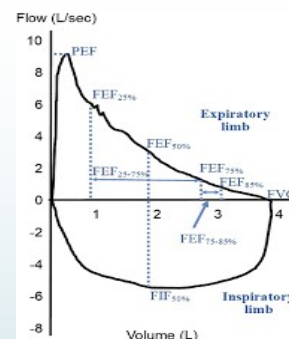
Where are the Small Airways in the Lung?

- The small airways of the lung are defined as the bronchial passages less than 2 mm in diameter and located beyond the 7th or 8th generation of the tracheobronchial tree. These airways account for >98% of the cross-sectional area of the lung and terminate with the alveolar sacs.




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It is defined as “forced expiratory flow over the middle one-half of the FVC; the average flow from the point at which 25% of the FVC has been exhaled to the point at which 75% of the FVC has been exhaled.” A reduced FEF25-75% is thought to be a marker of small airway obstruction, and there is now ample evidence of small airway obstruction in asthma



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At less than 16 years of age, measurements obtained annually can define a pattern of reduced lung growth characterized by a prebronchodilator FEV₁ consistently less than the 25th percentile or less than -1.67 when using a reported z score.

After age 16 years, a plateau in these measurements is likely to occur, and after about age 25 years, one can assess a decrease in lung function, again based on either prebronchodilator FEV₁ percentile or z score.