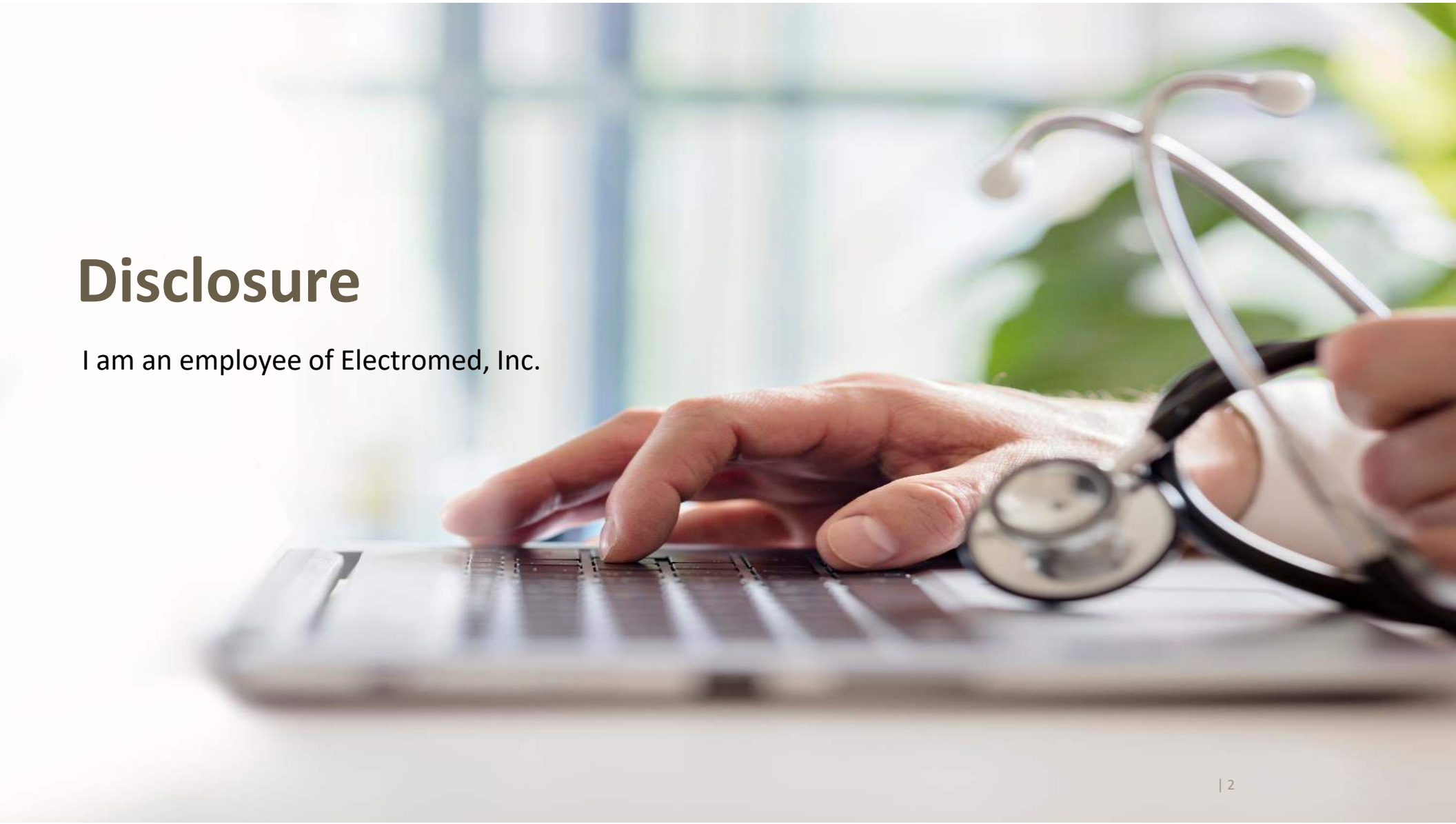
Bronchiectasis Overlap Syndromes: What's the Big Deal?

Speaker: Lisa Hinman, CRT

Disclosure

I am an employee of Electromed, Inc.



Objectives

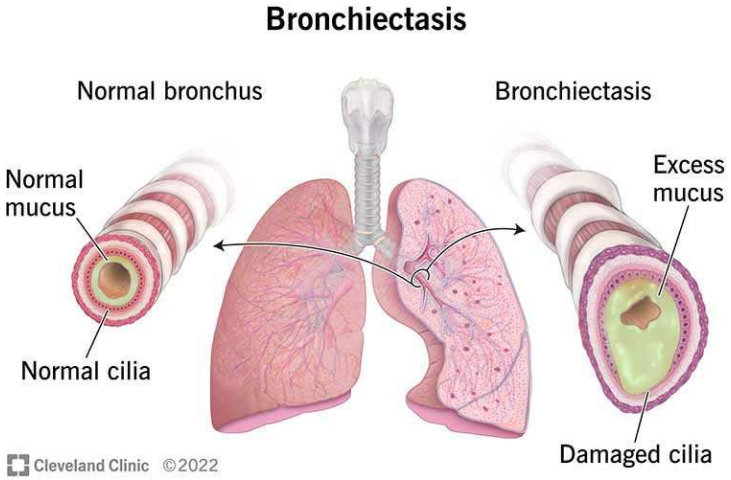
1. Review the disease of bronchiectasis
   - Prevalence in the U.S., causes, symptoms, diagnosis, and treatment options
2. Discuss bronchiectasis overlap syndromes
   - Patient identification and treatment management
3. Manage healthcare resource utilization
   - Evaluate the clinical and economic burden of bronchiectasis patients

Bronchiectasis Overview

What is Bronchiectasis?

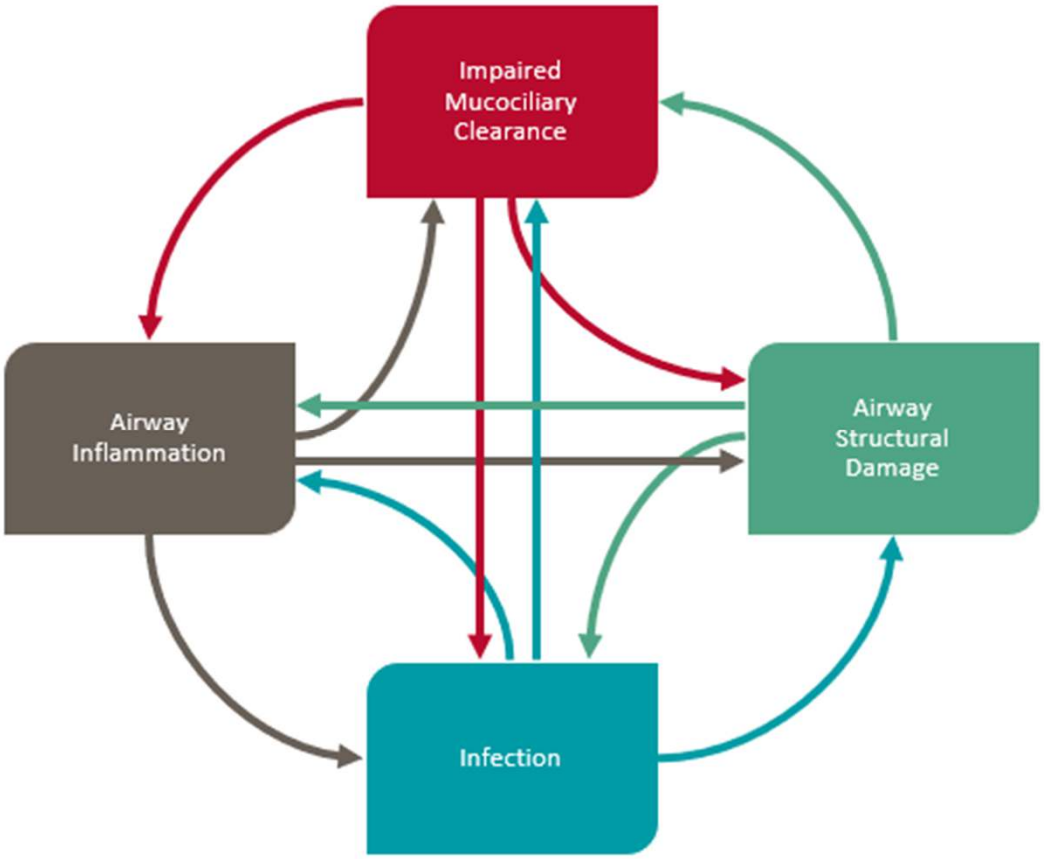
Bronchiectasis is a progressive airway disease in which the bronchi are **abnormally dilated (widened)**

This damage impairs the body's natural ability to clear mucus resulting in **chronic infections**



Unless appropriately managed, the combination of infection, inflammation, and impaired mucociliary clearance, results in **progressive lung damage** [1]

The Vicious Vortex



- Complex disease
- 4 pathophysiological processes
- "Initial insult" to the lungs[2,3]

Prevalence

Female

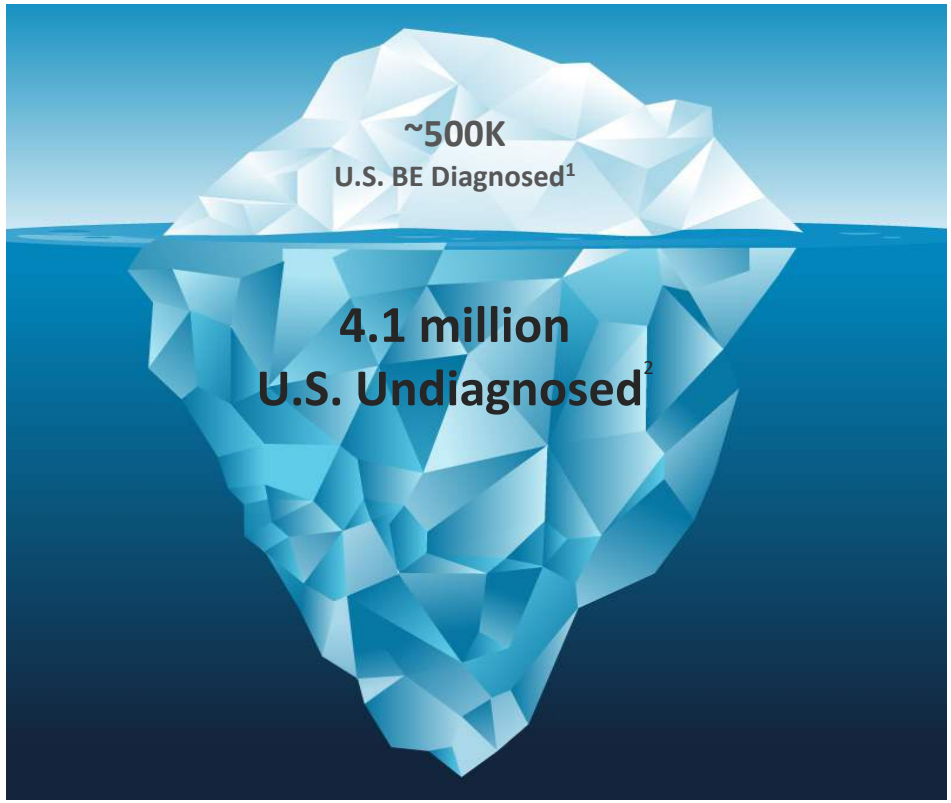
79.1%

White

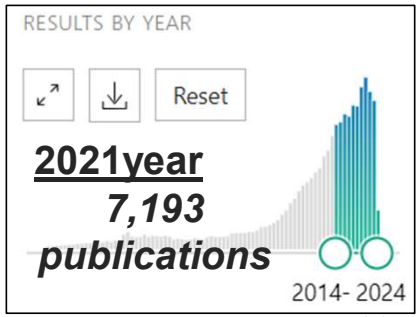
90.3%

Average Age

65.1[4]



COPD Research



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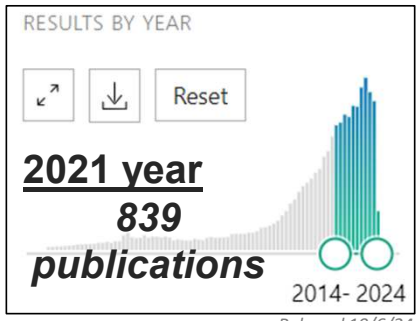
BE Research



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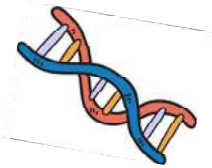
Diagnosed BE population growing at ~8% annually[1]

Causes



- Cystic fibrosis
- Primary ciliary dyskinesia

- Post-infective
- NTM
- HIV

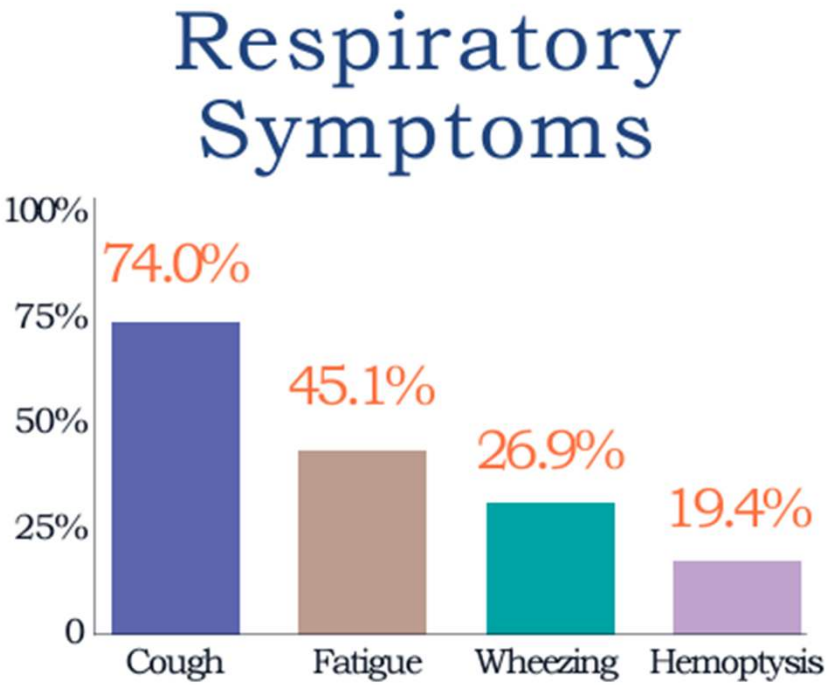
- Lupus
- Rheumatoid arthritis
- Connective tissue disease

- Crohn's
- IBD
- Ulcerative colitis
- GERD
- Aspiration

- COPD
- Asthma
- ILD
- ABPA[5]

~50% idiopathic

Symptoms

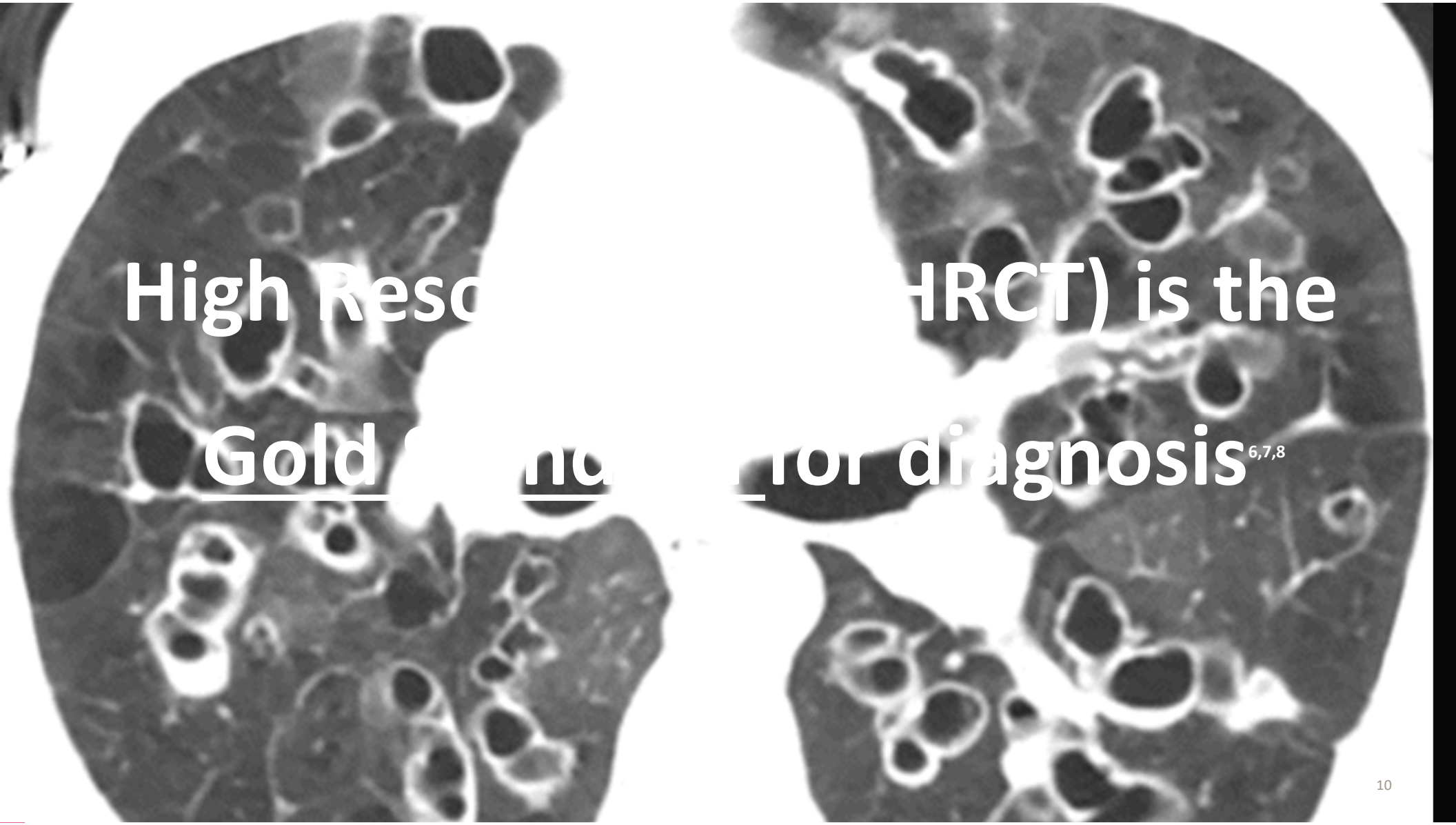


47.7%
have a history of pneumonia

61.6%
diagnosed with past or current NTM*

20.6%
diagnosed with past or current pseudomonas**[4]

** Defined by one or more positive culture -or- by physician diagnosis*
*** Defined by one or more positive culture*



High Reso HRCT) is the

Gold nd for diagnosis[6,7,8]

Treatment of Bronchiectasis

Treat the infection

Treat the inflammation

Treat the impaired mucociliary clearance

Treat the lung damage[6,7]

Airway Clearance Therapy (ACT)

Manual Techniques for Airway Clearance

- Breathing Techniques (Huff coughing, Active Cycle Breathing Technique, Autogenic Drainage)
- Chest Physical Therapy (CPT)
- Postural Drainage

Airway Clearance Devices[7]

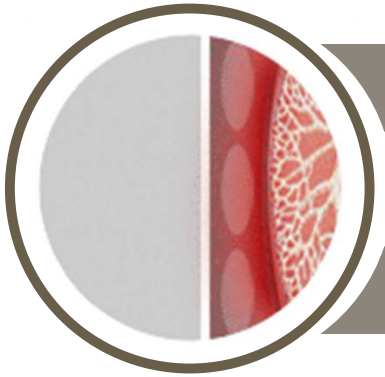
- PEP/OPEP
- Intrapulmonary Percussive Ventilation (IPV)
- Mechanical Insufflation-Exsufflation
- High Frequency Chest Wall Oscillation (HFCWO)

High Frequency Chest Wall Oscillation

HFCWO Mechanism of Action

Generator produces an alternating flow of air into the garment that rapidly compresses and releases the chest wall at a variety of frequencies and pressures.

At 15 compressions per second (Hz) for 20 minutes, HFCWO applies a shear force equivalent to 18,000 mini coughs.

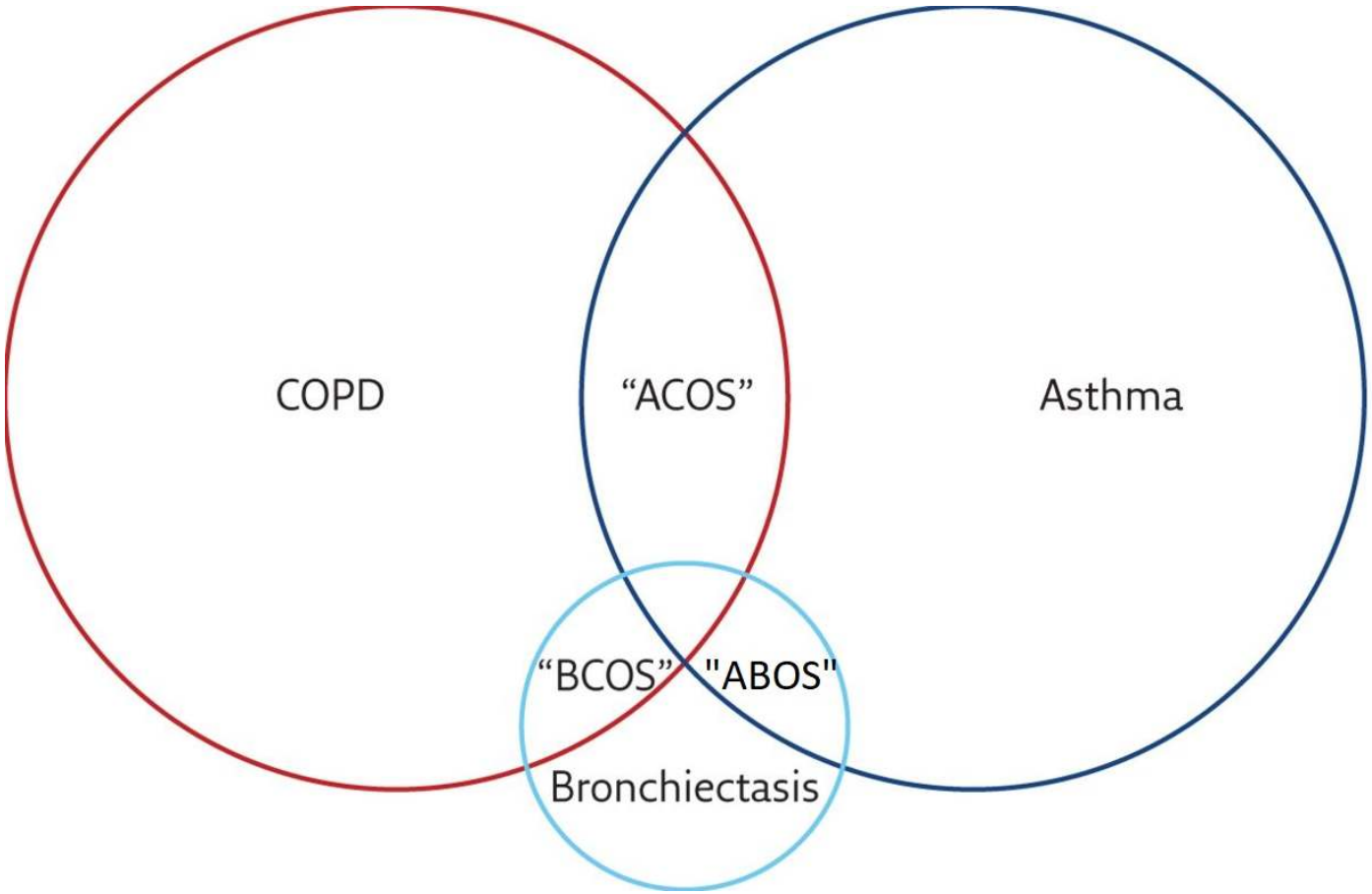


Forces produced by HFCWO ripple across retained secretions to **SHEER** mucus away from the walls of the airway.

This consistent force reduces the viscosity of the secretions, to make them **THIN**.

PROPEL the mucus up towards the large airway where it can be expectorated or suctioned more easily.

Bronchiectasis overlap syndromes deserve careful consideration to allow for correct diagnosis and appropriate treatment management[8]



Bronchiectasis and COPD

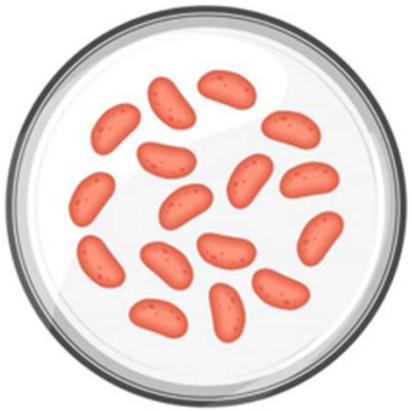
Bronchiectasis IS NOT COPD

- Chronic obstructive lung disease (COPD) affects 14.2 million adults in the U.S.[9]
- Global Initiative for Chronic Obstructive Lung Disease (GOLD) was launched in 1997 as the best practices and guidelines for the management of COPD[10]
- In 2014, bronchiectasis was added to the GOLD as a recognized comorbidity, but there are still no global guidelines for bronchiectasis
- ~50% of those with bronchiectasis in the U.S. carry a diagnosis of COPD[11]
- Individuals with both COPD and bronchiectasis have increased exacerbations and mortality, compared to those with COPD alone

Identification of BCOS

Overlap Symptoms

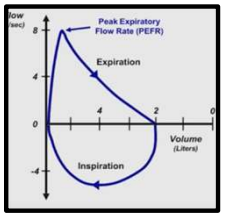
- Chronic cough
- Sputum production
- Hemoptysis
- Repeat chest infections
- Frequent exacerbations
- Fatigue-decreased activity
- Wheezing



Pseudomonas aeruginosa[11]

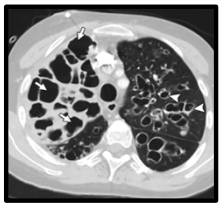
ROSE Criteria:[12]
Radiological BE
Obstruction
Symptoms
Exposure (≥10PY Hx)

Diagnosis of BCOS



COPD is a **physiological** diagnosis;

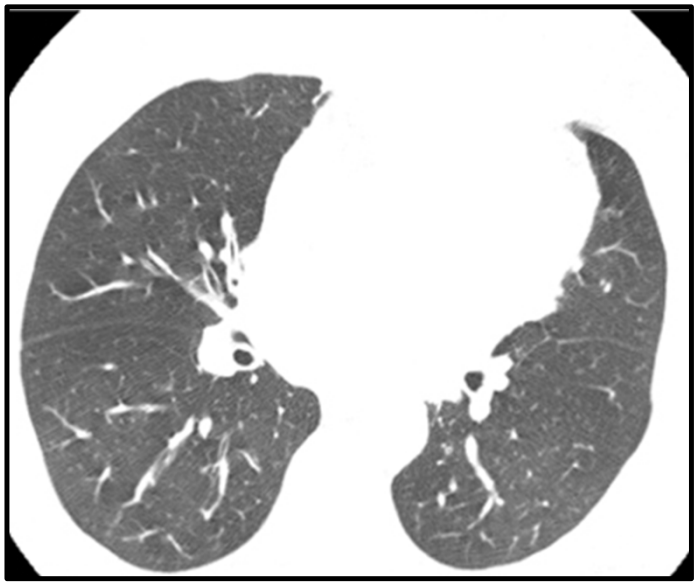
Assessed on poorly reversible airflow obstruction



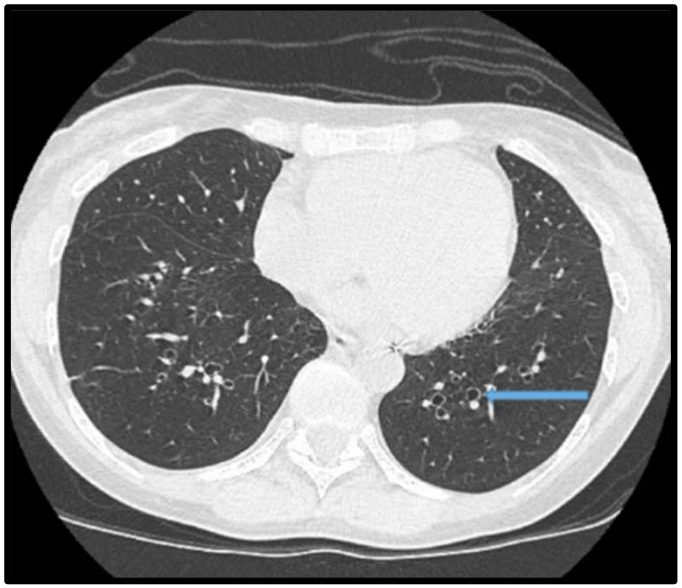
Bronchiectasis is a **structural** diagnosis;

Assessed on dilatation and thickening of the airways on HRCT[13]

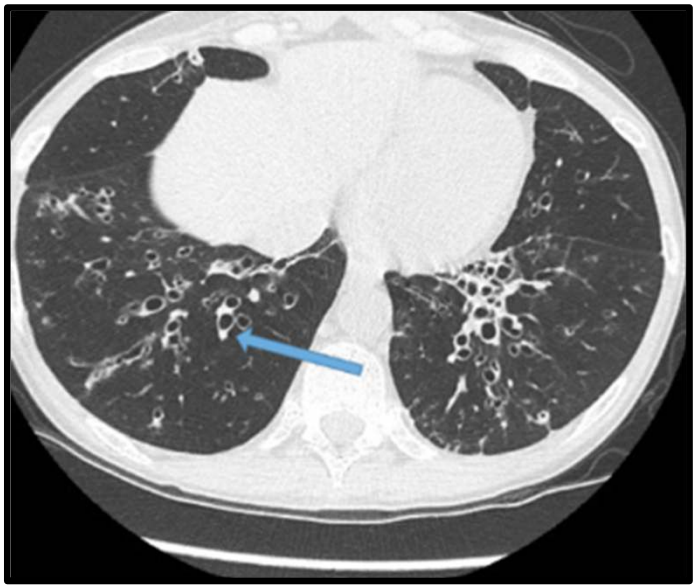
CT Comparison



COPD[14]



Bronchiectasis[15]



COPD & Bronchiectasis[15]

Treatment for BCOS

Standard bronchiectasis treatments

GOLD Guidelines

Considerations:

- ***Inhaled*** antibiotics are not recommended for COPD, due to bronchospasm, but may be indicated for bronchiectasis and/or *P. aeruginosa*[16]

What about ICS?

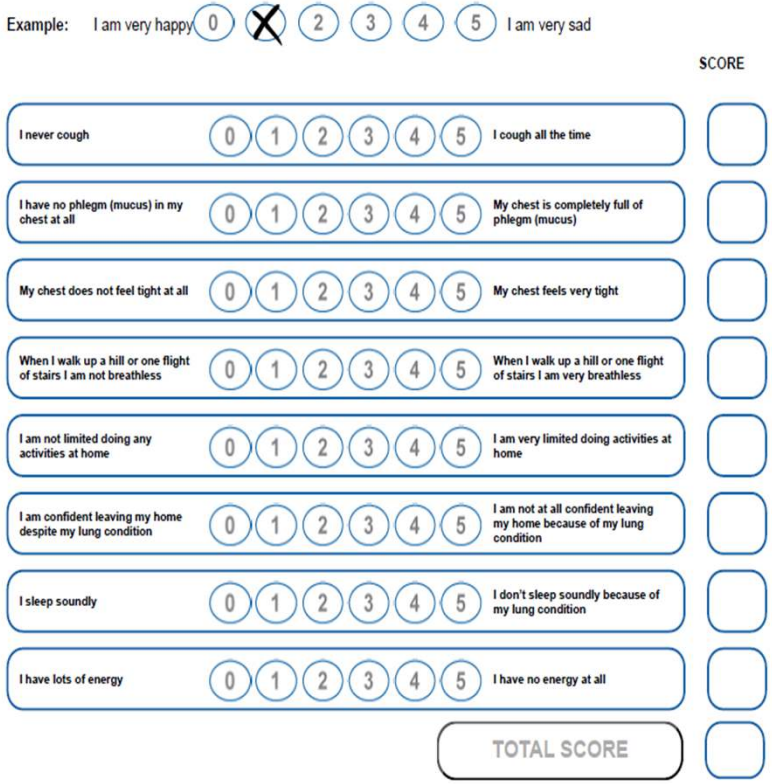
- Inhaled corticosteroids are **not recommended** in bronchiectasis patients without a qualifying underlying disease such as COPD or asthma[16]

- Steroids can be quite detrimental to a bronchiectasis patient should they not be needed for an underlying disease, as they may lead to pneumonia

- Being that ICS are primary effective in treating eosinophilic inflammation, research suggests that ICS should be not be used to treat neutrophilic inflammation[18]

COPD Assessment Tool (CAT) Scoring

- CAT measures respiratory symptoms and progression over time.
- Although used for COPD, CAT is a valid tool to measure symptoms in patients with bronchiectasis as well
- The updated CAAT is the exact same, now labeled the **C**hronic **A**irways **A**ssessment **T**est to permit its application to other conditions[17]



Bronchiectasis and Asthma

Bronchiectasis IS NOT ASTHMA

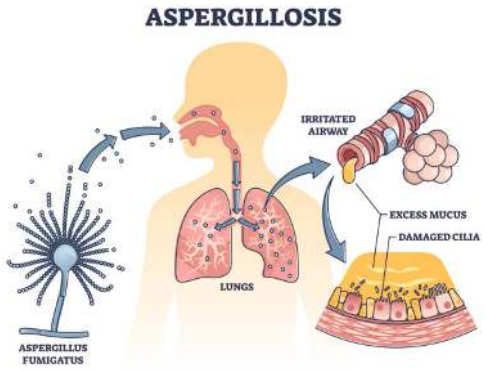
- Bronchiectasis may go undiagnosed in asthmatics due to similar symptoms, such as wheezing, cough, and sputum production, and obstructive pattern[19]
- Prevalence of ABOS ranges from 2.7% to 42%, depending on the type of asthma and the severity of the disease
- When a patient does not respond to standard therapy, bronchiectasis should be suspected
- Those with severe asthma, non-allergic asthma, and with frequent exacerbations are more likely to have bronchiectasis[20]

Identification of ABOS

Overlap Symptoms

- Chronic cough
- Sputum
- Recurrent exacerbations
- Wheezing

On optimal management, but doesn't respond to standard therapy[19]

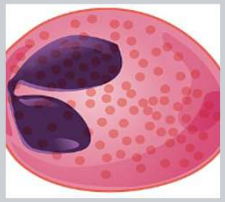


Allergic bronchopulmonary aspergillosis (ABPA)[19,20]

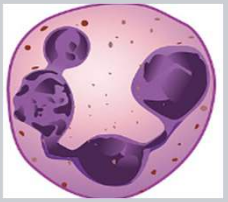
Diagnosis of ABOS

Asthma is diagnosed by a detailed history and clinical examination

· Spirometry · Allergy testing · Sputum cultures · FeNO · Methacholine challenge



Asthma is primarily **eosinophilic** airway inflammation (type 2)[20]

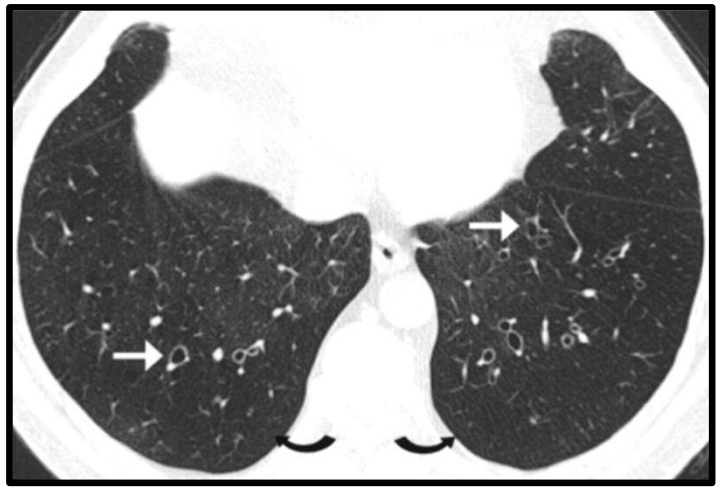


Bronchiectasis airway inflammation is predominantly **neutrophilic** (70%) or **eosinophilic** (30%)[21]

CT Comparison

Asthma (air trapping)[22]

Bronchiectasis[6]



Bronchiectasis & asthma[23]

Treatment for ABOS

Standard bronchiectasis treatments

GINA Guidelines

Considerations:

- ERS suggests that the diagnosis of bronchiectasis should not affect the use of inhaled corticosteroids in patients with comorbid asthma or COPD[22]

Clinical & Financial Burden

Clinical Burden

- Misdiagnosis or delay to bronchiectasis diagnosis is vast among overlap syndromes due to similarities in symptoms and characterization of airflow obstruction[24]

- Research has consistently shown that patients with BCOS have an increased risk of exacerbations and a significantly higher risk of mortality[25]

- ~30% of severe asthmatics have comorbid bronchiectasis
  - Severe asthmatics with bronchiectasis have a hospitalization rate more than twice that of those with asthma alone[20]

Financial Burden

- Annual respiratory related healthcare costs of BCOS patients were more than two times the cost than patients with COPD alone[26]
- The financial burden of ACOS has not been well researched, but the all-cause healthcare cost for those with asthma-COPD overlap is 2x that than those with asthma alone[27]

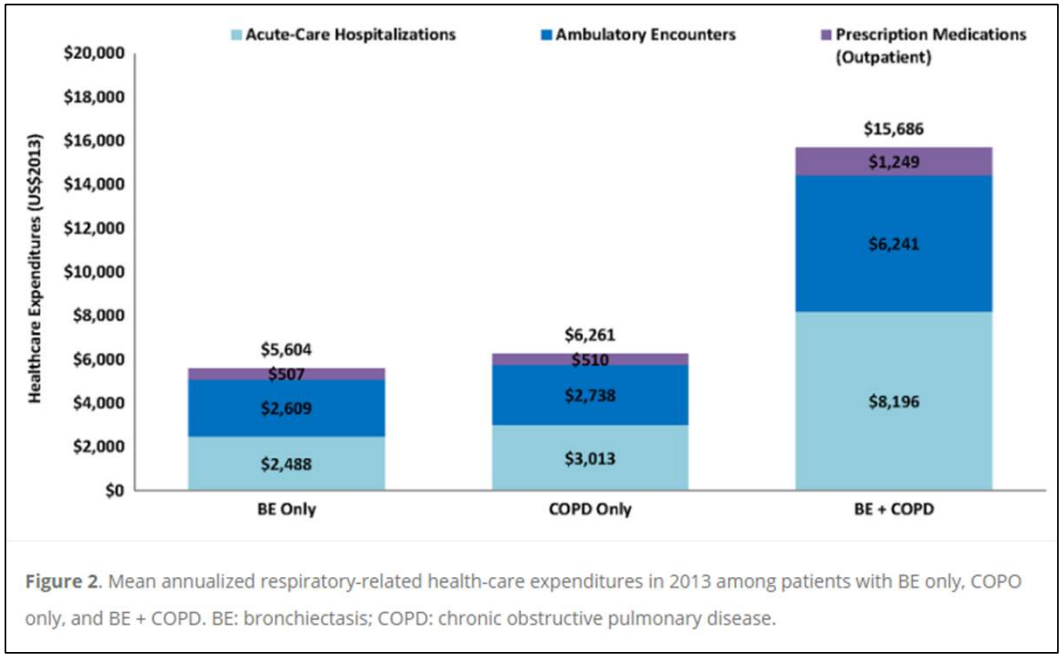


Figure 2. Mean annualized respiratory-related health-care expenditures in 2013 among patients with BE only, COPO only, and BE + COPD. BE: bronchiectasis; COPD: chronic obstructive pulmonary disease.

Seifer, FD, et al. (2019). Chronic Respiratory Disease. https://doi.10.1177/1479973119839961

CHEST INFECTIONS ■

What Is the Health Care Resource Utilization and Economic Burden of Bronchiectasis in Adults and Children?

STUDY DESIGN

Systematic review of published studies of **economic burden and health care utilization in adults and children with bronchiectasis** between 2001 to 2022

597 publications identified

53 **included**

RESULTS

Total annual health care costs

$3,579 to $82,545
*Driven by hospitalization costs

Indirect costs
(lost income due to illness)
$1,311 to $2,898

$23,687

Indirect costs
Missed 12 school days/year

Aggregate annual health care costs (in US dollars)

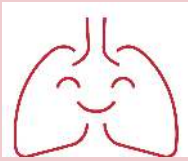
USA	$14.68 billion/year
United Kingdom	$1.63 billion/year
Spain	$1.34 billion/year
South Korea	$981.03 million/year
Germany	$740.30 million/year
Singapore	$101.60 million/year
Australia	$17.77 million/year

There is substantial economic burden of bronchiectasis for patients and health care systems, but there is a notable absence of data regarding the impact in children and economically disadvantaged communities.

Roberts JM, et al. *CHEST* December 2023 | @journal_CHEST | https://doi.org/10.1016/j.chest.2023.06.040

Summary

Although 500K have been diagnosed with BE, there are still potentially 4.1 million that haven't been, growing at 8% annually



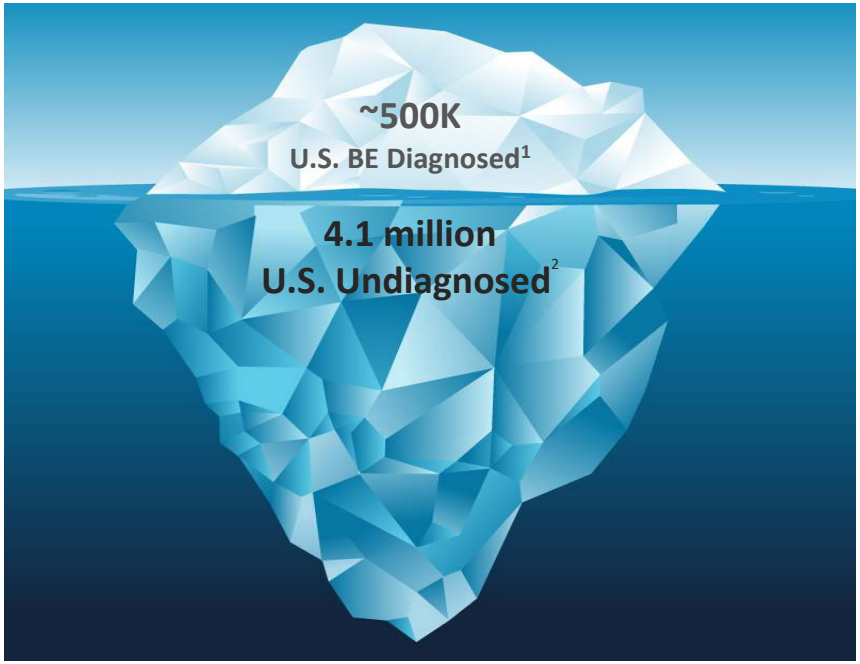
COPD and asthma are common diseases that overlap with bronchiectasis

Identification of bronchiectasis is essential to provide a complete care for the disease

The clinical and financial burdens are vast, and increase with overlap syndromes, which is why correct diagnosis and appropriate treatment management are key

RT Call to Action

- What's your role?
  - Inpatient
  - Clinic / Outpatient
  - COPD Navigator / Educator / Discharge Management
- What to look for?
  - Frequent exacerbations
  - Chronic productive cough
    - What's growing in the sputum?
    - Hemoptysis
  - Co-morbidities
- Have they had an HRCT?
- What is the ACT management plan for home?
  - Reduce the risk of exacerbations and hospitalizations



Resources

- **Bronchiectasis and NTM Initiative** https://www.bronchiectasisandntminitiative.org/
- **World Bronchiectasis Day** www.WorldBronchiectasisDay.org
- **The Bronchiectasis and NTM Research Registry** https://copdf.co/BRR
- **COPD Foundation** https://www.copdfoundation.org/

Thank you! Questions?

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