Chronic cough

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Disclosures

- I have no conflicts of interest to disclose.

Objectives

- Differentiate acute from chronic cough
- Review the most common causes as well as uncommon causes of chronic cough
- Discuss treatment strategies

Definitions and Epidemiology

- Cough
  - Acute = up to 3 weeks
  - Subacute = 3-8 weeks
  - Chronic = >8 weeks

- Most common symptom among outpatients
  (>26 million office visits US)

- ~40% of outpatient pulmonary practice

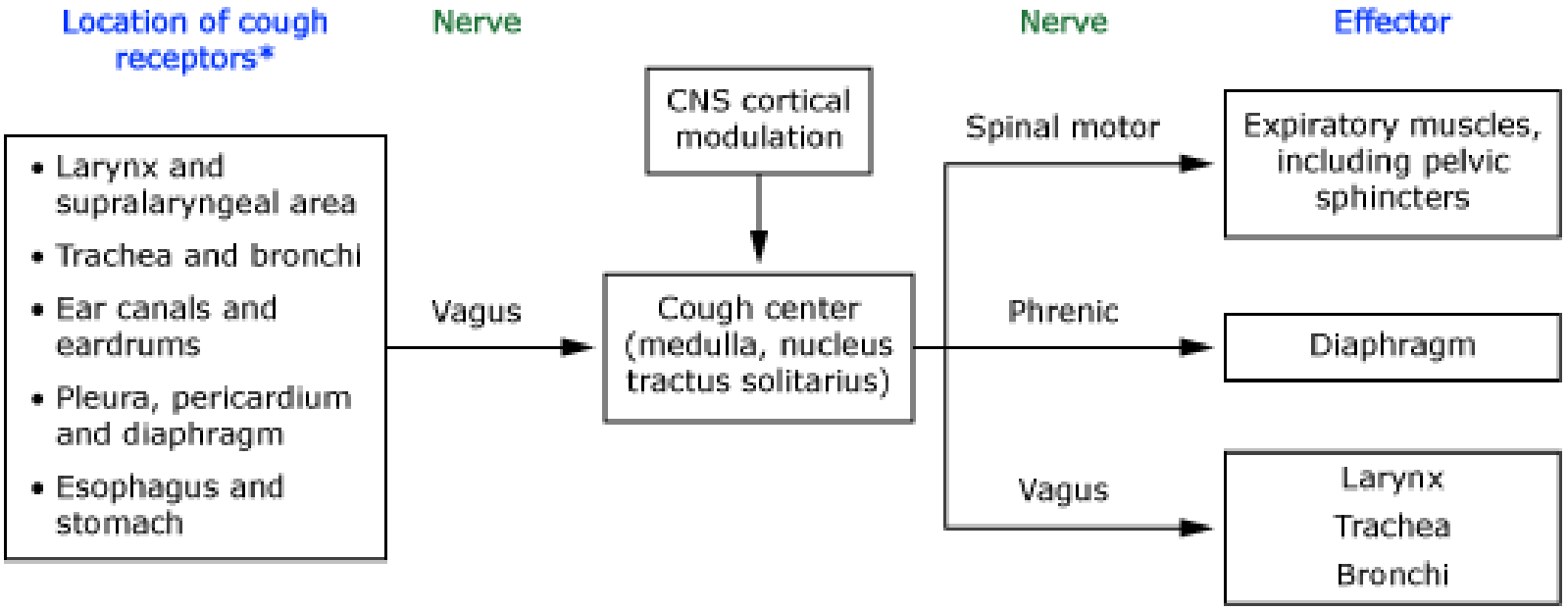
--ACCP: Consensus Statement on Cough. *Chest* 2006

Spectrum of Reasons Patients Seek Medical Care for Cough

- Reassurance nothing serious (77%)
- Exhaustion (54%)
- Others think something wrong (53%)
- Embarrassment/self-consciousness (47%)
- Difficulty speaking on the phone (39%)

--ACCP: Consensus Statement on Cough. *Chest* 2006

Mechanism of Cough



Common Causes of Chronic Cough

- Upper Airway Cough Syndrome
- Asthma
- GERD
- Chronic Bronchitis
- Vocal cord dysfunction/Laryngeal sensory neuropathy
- Medication side effects

- Many have more than one reason/explanation!

Causes of Chronic Cough

- ACE Inhibitor
- Smoking
- GERD
- Asthma
- Upper Airway Cough Syndrome (UACS)
  - Rhinitis
    - Allergic rhinitis
    - Perennial non-allergic rhinitis
    - Post-infectious rhinitis
    - Rhinitis from anatomic abnormalities, irritants, occupational exposures, medication, pregnancy
- Sinusitis
  - Bacterial sinusitis
  - Allergic fungal sinusitis
- NAEB (non-asthmatic eosinophilic bronchitis)
- COPD
- Cancer
- ILD
- Bronchiectasis
- Aspiration
- Post-infectious
- Tuberculosis or other infection
- Habit cough
- Other lung disease

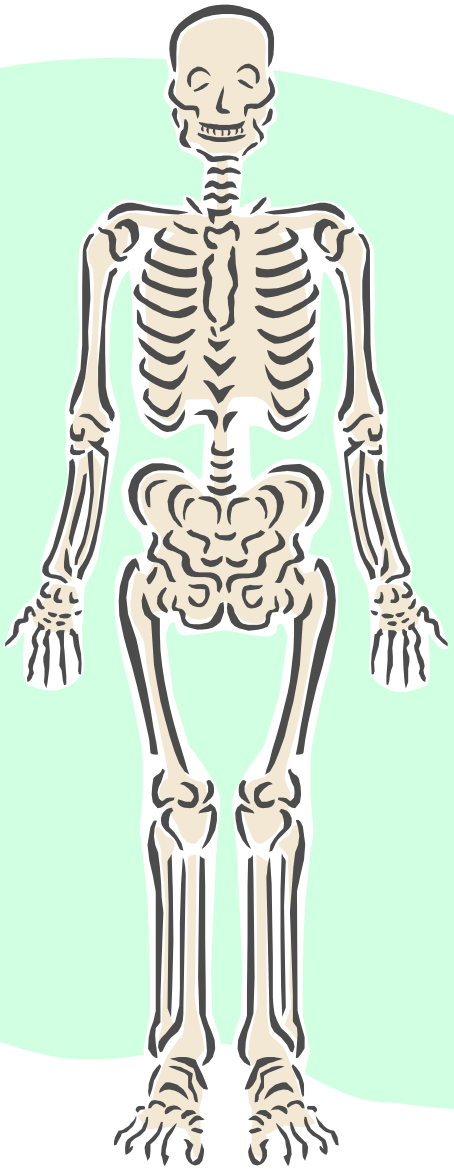
Complications

Embarrassment

Pneumothorax

Rib fractures

herniations



syncope

fatigue

arrhythmias

incontinence

FEAR

Approach to Cough

1) History, Exam
2) CXR, Spirometry
3) If cause apparent - treat
4) If no obvious cause:
   - UACS (upper airway cough syndrome)
   - GERD (gastroesophageal reflux disease)
   - Asthma
   - NAEB (nonasthmatic eosinophilic bronchitis)

Upper Airway Cough Syndrome (UACS)

- Majority of studies: UACS most common cause chronic cough
  - Symptoms:
    - nasal discharge
    - post nasal drip
    - frequent throat clearing
      - May not be apparent to the patient
- Exam: cobblestone/secretions in nasopharynx
- Response to Rx usually secures diagnosis

Upper Airway Cough Syndrome (UACS)

- Rhinitis
  - Allergic
  - Perennial non-allergic
  - Post-infectious
  - Occupational exposures
  - Vasomotor
- Sinusitis
  - Bacterial
  - Allergic fungal

Upper Airway Cough Syndrome (UACS)

- Treatment:
  - Nasal corticosteroids
  - Antihistamines
    - Nasal
      - May be more effective in NAR
    - Oral
      - Can use combination with decongestant.
  - Oral leukotriene modifiers
    - Good choice in cases of concomitant asthma

Recommendations

- If cause of UACS is apparent – treat
- Empiric trial of therapy for UACS
- A patient suspected of having UACS who does not respond to empiric therapy should undergo sinus imaging.

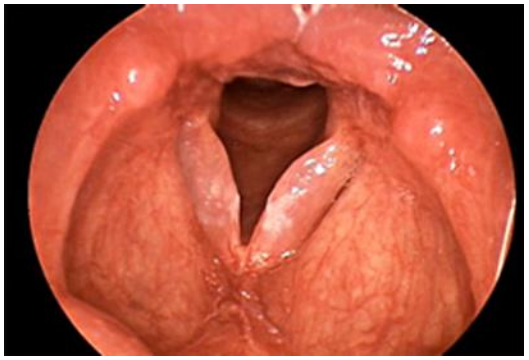
Gastroesophageal Reflux (GERD)

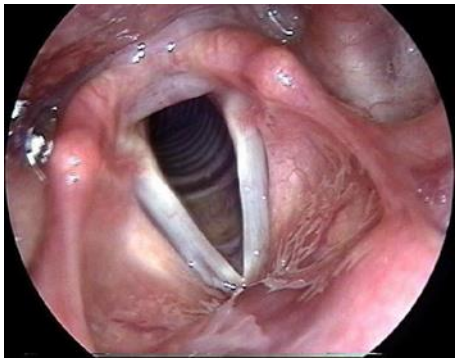
- One of the most common causes of cough
  - Up to 40% cases

- Three ways that GERD causes cough:
  - Aspiration into airways
  - Reflux laryngitis
  - Esophageal-bronchial cough reflex.
    - Reflux into distal esophagus enough to cause cough.

Gastroesophageal Reflux (GERD)

- Laryngeal-Pharyngeal Reflux (LPR)
  - Throat clearing
  - Hoarseness
  - Globus sensation





- May take up to 8 weeks of treatment with PPI to see improvement

Gastroesophageal Reflux Disease - Treatment

- Proton-pump inhibitor (PPI)
- Lifestyle modifications
  - Weight loss
  - Avoidance of caffeine, smoking
  - Elevation of the head-of-bed

Asthma

- History includes episodic wheezing and dyspnea
- “Cough variant asthma”…no wheezing/dyspnea, only cough, normal spirometry
- Other clues from history:
  - atopy
  - family history of asthma
  - seasonal
- Spirometry
- Bronchoprovocation tests: Excellent negative predictive value; + test c/w but not diagnostic (false + ~ 33%)

Non-Asthmatic Eosinophilic Bronchitis

- Distinct from asthma; no bronchospasm
- Recognized 2002; frequency uncertain (European studies 10-15%), probably under diagnosed
- Clinical characteristics
  - Unexplained nonproductive cough
  - Atopic; normal spirometry & bronchoprovocation tests
  - (Induced) Sputum eosinophilia & airway inflammation
  - Elevated exhaled nitric oxide
- Treatment: Inhaled steroid

Gibson et al: *Thorax* 2002
Rytila et al: *Eur Respir J* 2000

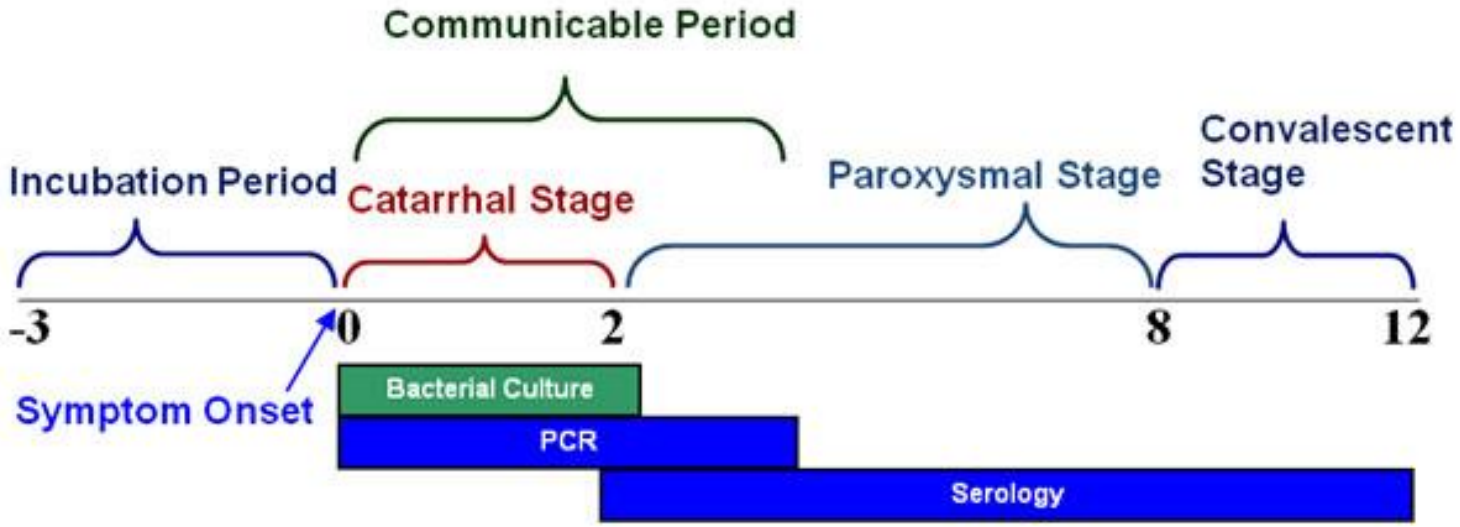
ACE Inhibitor-Induced Cough

- can occur at any time after initiation of ACE Inhibitor (1st dose to months)
- After cessation of medication – cough usually resolves in 1-4 weeks, but can take up to 3 months
- Can try switching to angiotensin- receptor blocker.

Bordetella pertussis

- 3 phases:
  - Catarrhal 1-2 weeks
    - nonspecific URI sx
    - Excessive lacrimation
    - Conjunctival injection
  - Paroxysmal 2-3 months
    - Coughing spells (paroxysmal with inspiratory whooping sound, post-tussive emesis, syncope)
  - Convalescent ~4 weeks
    - Persistent but decreased cough

Bordetella pertussis



http://www.cdc.gov/pertussis/clinical/diagnostic.html

Bordetella pertussis

- Incubation period can be prolonged
- Highly contagious
- Vaccination wanes after 5-10 years and rarely lasts more than 12 years
  - Preteens and teens 11 through 18 years old (preferably at 11-12 years old) should receive a single dose of Tdap
  - Adults 19 years or older who did not receive Tdap as a preteen or teen should also receive a single dose of Tdap

Bordetella pertussis

- Diagnosis
  - NP aspirate or polymer swab of NP for culture
  - PCR costly supplement dx
  - Acute & convalescent IgG or IgA titers
- Treatment Catarrhal Phase
  - Macrolide (erythro-, azithro-, clarithromycin)
  - Don’t delay Rx waiting for confirmation tests
  - Isolation for 5 days from start of Rx
- Treatment Paroxysmal Phase:
  - Supportive care
- Prevention after exposure
  - Macrolide Rx same as Treatment dose/duration

Vocal cord dysfunction (VCD)

- VCD is upper airway obstruction associated with the paradoxical adduction or closure of the vocal folds occurring primarily on inhalation.

- The clinical presentation ranges from mild dyspnea to acute, severe respiratory distress and is often mistaken for an asthma attack

VCD Triggers

- Similar to asthma:
  - Exercise
  - Stress
  - Upper respiratory infections
  - Strong chemical fumes and odors
  - GERD
  - Post-nasal drip

Etiology of vocal cord dysfunction

- Upper airway hyperresponsiveness (irritable larynx syndrome) secondary to:
  - Laryngopharyngeal reflux
  - Inflammatory upper airway disease (allergic, non-allergic, viral rhinitis, sinusitis, postnasal drip)
  - Toxic inhalation (occupational, accidental)
- Autonomic dysfunction of the larynx
- Primary psychiatric disorder
  - Panic or anxiety disorder
  - Depression
  - Conversion disorder (unresolved psychiatric conflicts)
  - Stress

Diagnosis of VCD

Gold standard diagnostic tool is videolaryngostroboscopy (VLS)

Normal

VCD


COMMENT
Facility
Dr.

Treatment of VCD

- Speech therapy is the cornerstone treatment for VCD.
  - Increase awareness of breathing and remediation of maladaptive breathing patterns
  - Increase awareness of body posture and encourage relaxation of throat muscles
  - Utilize chronic cough suppression techniques
  - Utilize throat clearing elimination techniques
  - Maximize vocal hygiene

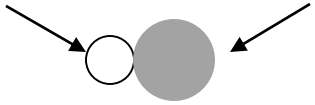
Laryngeal sensory neuropathy

- “Irritable larynx syndrome”
- Chronic spasmodic coughing fits
- Often voice changes as well
- Diagnosis of exclusion
- Often provoked by a URI
- Treatment with neuromodulators and Tramadol has been shown to be successful.

Bronchiectasis

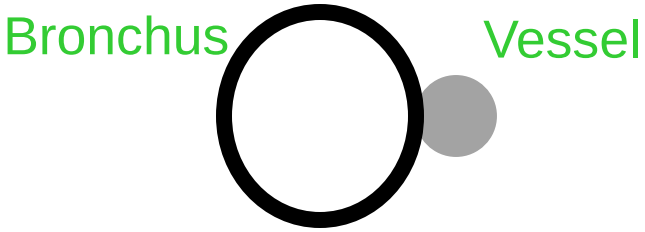
- Normal:

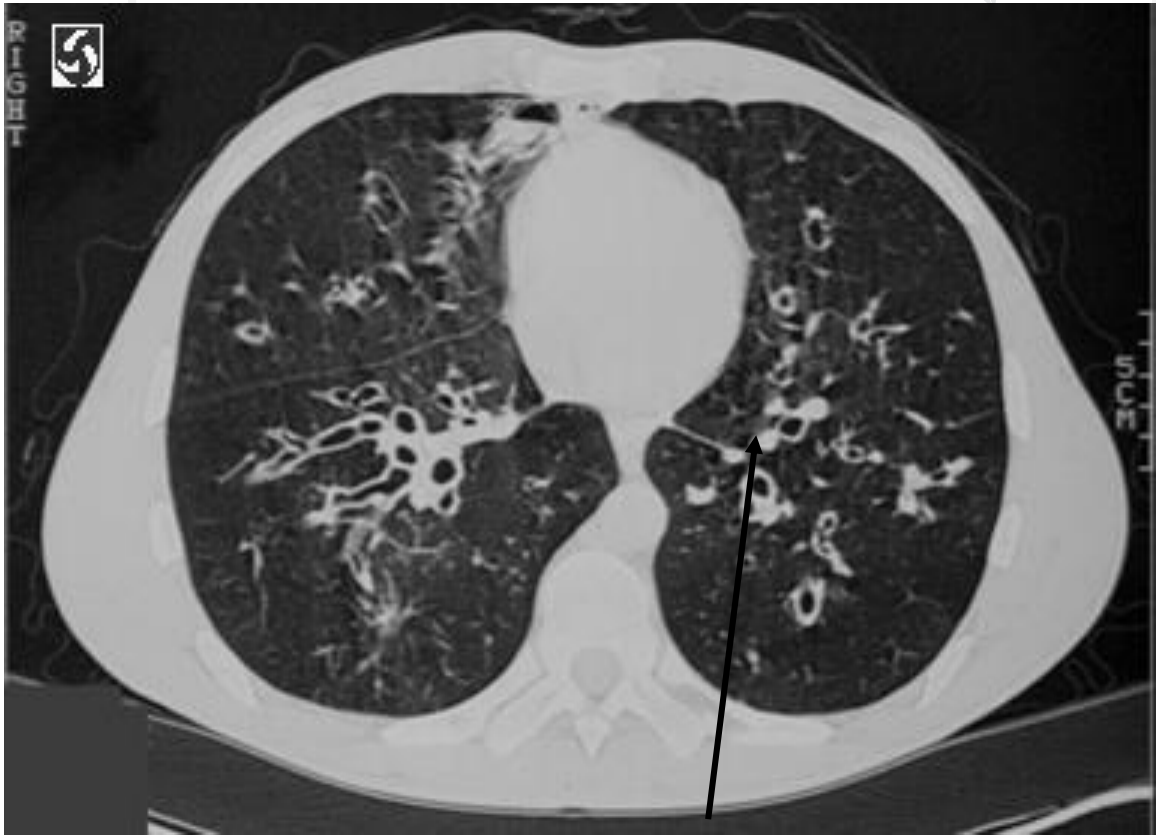
Bronchus Vessel



- Signet ring:

Bronchus Vessel





- Clusters = Grape-like appearance
- Distribution can help suggest dx:
  - Central→ABPA
  - Upper lobe → CF
  - Lobar → Post-infectious; obstructive (i.e. FB)

Bronchiectasis Differential Diagnosis

- Post-infectious
- Airway obstruction or recurrent aspiration
- Cystic Fibrosis
- Immunodeficiency (Agammaglobulinemia)
- Esoterica…
  - Alpha-1-Antitrypsin Deficiency
  - Inflammatory Disease (eg, Sjogren's)
  - Allergic Bronchopulmonary Aspergillosis
  - Dyskinetic Cilia Syndrome
  - Diffuse Pan Bronchiolitis
  - Young's Syndrome

MAC Lung Infections

- Majority of NTM respiratory isolates are MAC and are pathogenic in 50% cases
- Incidence rising…~8/100,000
- Worldwide, most common in temperate regions
- Isolated in bedding material, house dust, soil, plants, swimming pools, hospital H2O, natural bodies of H2O
- Reactivity with PPD (70%)

MAC Lung Infection

- Persistent cough, dyspnea, malaise, weakness
- Symptoms antedate MAC diagnosis (months-years)
- Elderly>>young, Non-smoking female >>male
- Chronic indolent process (symptoms can spontaneously abate)
- MAC Infection is not the disease, but symptom of the disease
- Patients die with, rather than from disease
  (Mortality estimates: 5-20%)

General MAC Lung Infection Treatment

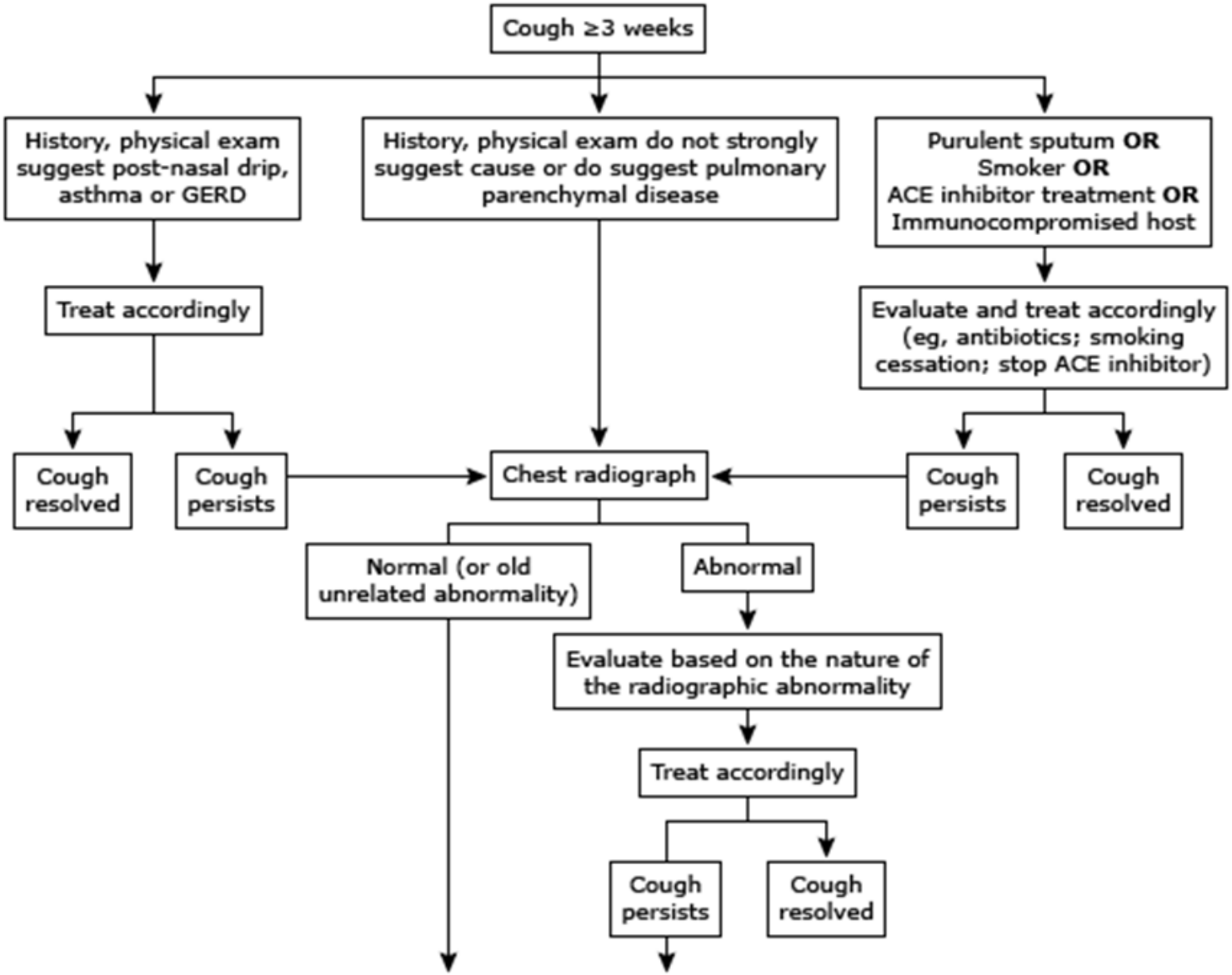
- Careful patient selection
  - ~50% nonpathogenic
  - ATS/IDSA criteria
  - Expensive, long duration, intolerance & toxicity (elderly), compliance
    - Azithromycin (500 mg three times per week) PLUS
    - Rifampin (600 mg three times per week) PLUS
    - Ethambutol (25 mg/kg three times per week)

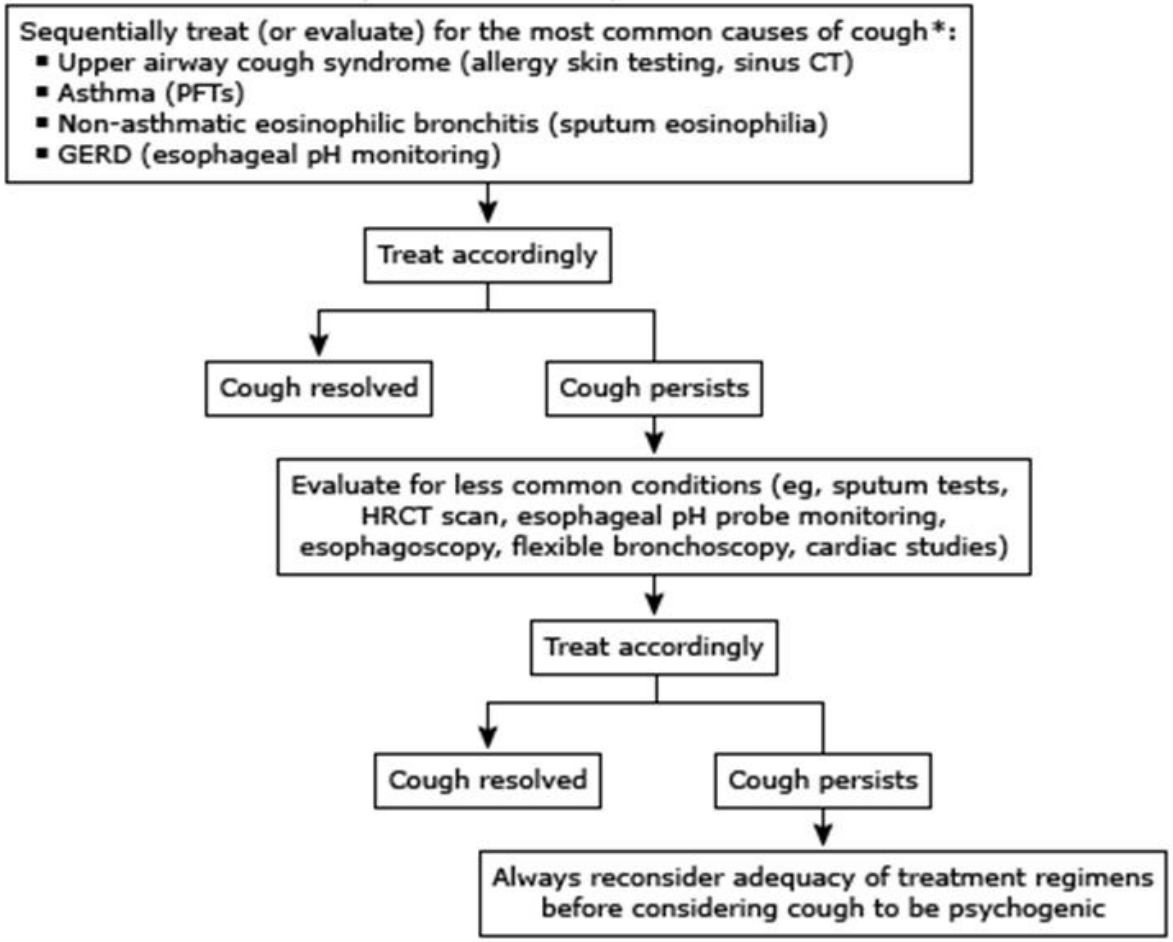
- Continue treatment until culture neg. x 12 months

Non-specific Treatments

- Central acting anti-tussive agents
  - Narcotics
  - Dextramethoraphan, up to 60 mg
    - Meta analysis (Yancy et al. *Chest* 2013;144:1827-38) both > placebo;
      - no good comparison studies
      - no studies examine chronic/refractory cough

- Peripherally acting agents
  - Benzonatate
    - inhibits stretch receptors
  - Guaifenesin
    - hydrates mucous for expectoration
    - may suppress hypersensitive cough receptors




Sequentially treat (or evaluate) for the most common causes of cough*:
Upper airway cough syndrome (allergy skin testing, sinus CT)
Asthma (PFTs)
Non-asthmatic eosinophilic bronchitis (sputum eosinophilia)
GERD (esophageal pH monitoring)
Treat accordingly
Cough resolved
Cough persists
Evaluate for less common conditions (eg, sputum tests, HRCT scan, esophageal pH probe monitoring, esophagoscopy, flexible bronchoscopy, cardiac studies)
Treat accordingly
Cough resolved
Cough persists
Always reconsider adequacy of treatment regimens before considering cough to be psychogenic


Questions?