Essential work-up of chronic cough

VyVy N. Young, MD
Associate Professor, Dept of Otolaryngology – Head and Neck Surgery

UCSF Voice and Swallowing Center
University of California, San Francisco
vyvy.young@ucsf.edu

Disclosure

- None personally

- Spouse:
  - Olympus America Inc. (consultant)
  - Instrumentarium (royalties/holder of intellectual property rights)
  - Freundenberg (consultant)
  - Reflux Gourmet LLC (stock shareholder)
Objective

- Review essential **workup** of chronic cough
- NOT treatment of chronic cough

Chronic Cough

- One of the most common reasons that patients seek ambulatory medical treatment\(^1\)

- Prevalence: 9-33% worldwide
- Annual US spendings on cough: $3.6B\(^2\)

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Chronic Cough

- Duration = 8 weeks
  - 3-8 weeks may be still infectious/inflammatory
    - Pertussis
    - Atypical PNA
    - Viral Bronchitis

- Spectrum of laryngeal hyperfunction/hypersensitivity
  - Throat clearing
  - Chronic cough
  - Cough paroxysms with post-tussive emesis.

“Roundabout” illness

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Etiology of Chronic Cough

**Pulmonary**
- Cough variant asthma
- COPD/bronchitis
- Bronchiectasis
- Eosinophilic bronchitis
- Pertussis, TB
- Lung cancer
- Pulm fibrosis

**Systemic/environmental**
- Meds: ACE inhibitors, ARBs, Advair
- Smoking
- CF, sarcoidosis, GPA
- Dehydration

**Rhinologic**
- Chronic sinusitis
- Allergic rhinitis/PND

**Laryngeal/neurologic**
- Neurogenic cough
- “Hypersensitivity” syndromes
- Glottic insufficiency
- Lesion
- Paradoxical vocal fold motion
- Post viral vagal neuropathy

**Esophageal**
- GERD/LPR
- Esophageal abn/dysphagia

**Habitual**

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Irwin RS, *Chest*, 2006; 129:80S-94S
Irwin RS et al, *Chest* 1998; 114(suppl 2):133S-181S
Rational approach to evaluation/treatment

Many algorithms proposed
Use one that makes sense to you

Algorithm for chronic cough – option 1

First Evaluation:
- Chest Xray
- PFTs
- Chronic sinusitis - maximal medical therapy\(^a\)
- Empircic acid reflux treatment (3 mo.)\(^b\)
- Laryngoscopy (stroboscopy)
- Speech therapy
- D/C ACEI
- D/C laryngeal irritants\(^c\)

Second Evaluation (3 months):
- Steroids trial\(^d\)
- Sinus CT
- Pulmonary referral
  - Chest CT
  - Bronchoscopy
- Allergy Testing

Consider refractory GERD/LPR if:
BMI>35-40
Nocturnal arousals
OSA

Then get:
- pH/impedance testing
- TNE/EGD
- Anti-reflux surgery referral

Consider neurogenic cough if:
Triggers (odors, temperature)
Antecedent URI\(^e\)
VF/MA
SLN block improves symptoms

Then try:
- 1st line Neuromodulators\(^f\)
- 2nd line Neuromodulators\(^g\)
- SLN block series

Consider glottic insufficiency if:
Gap on stroboscopy

Then try:
- Injection laryngoplasty
- Post injective voice therapy

Courtesy of Dr. JP Giliberto (UWash) and Dr. Lyndsay Madden (Wake Forest)
Algorithm for chronic cough – option 2

Algorithm for chronic cough – option 3

Systemic Disease and other:
- Flexible laryngoscopy
- Stroboscopy
- Stereotext
- Biopsy
- Steroid injection

Neurologic:
- MRI brain
- Modified barium swallow
- Laryngeal EMG
- Laryngeal function studies
- Botulinum injection
- Vocal fold injection
- Medalization laryngoplasty

Tumor:
- CT neck
- CT chest
- MRI
- Ultrasound
- FNA
- PET
- Laryngoscopy & biopsy
- Surgery
- Radiation therapy
- Chemotherapy
- Rehabilitation

Rhinologic:
- RAST
- Allergy skin testing
- Nasal endoscopy
- Sinus CT
- Immunotherapy
- FESS
- Sinusplasty

Pulmonary:
- PFTs
- Methacholine challenge
- Chest X-ray
- Chest CT
- Bronchoscopy
- Airway fluoroscopy
- VATS thoracotomy

Esophageal:
- Barium esophagogram
- TNE
- Manometry
- 24-hour pH/impedance
- Gastric emptying
- CP myotomy
- Zinger's diverticulotomy

Chronic Cough

Algorithm for chronic cough – option 4

1. Careful review of management prior to referral

2. Considering the following:
   - Any remaining investigations to be undertaken?
   - Were trials of therapy optimal?

3. Patient adherent?
   - Yes: Optimize treatment
   - No: Manage nonadherence

4. Cough resolved?
   - Yes: Consider the following:
     - Speech and language intervention
     - Empiric trial of gabapentin
     - Referral to specialist cough clinic
     - Recruit to clinical trial
   - No: Cough resolved

Algorithm for chronic cough – option 5

1. Identification and Treatment of Obvious Causes
   - Medical history and clinical examination; consider medications (e.g., ACE inhibitors) as potential causes and look for “red flag” symptoms suggesting serious underlying disease (e.g., weight loss or hemoptysis), possible foreign body inclusions requires urgent bronchoscopy
   - Chest radiography
   - Spirometry

2. Focused Testing for and Treatment of Asthma, Gastroesophageal Reflux, and Rhinosinusitis
   - Assessment of bronchial hyperresponsiveness, FEV1 symptom eosinophil count
   - Consideration of nasendoscopy and consultation with an otolaryngologist
   - Consideration of monitoring of pH and MI (in patients with symptoms of heartburn or regurgitation)
   - Consideration of empirical treatment as appropriate

3. Comprehensive Investigation to Exclude Rarer Causes
   - High-resolution CT scanning of chest
   - Bronchoscopy (if not already performed)

4. Neuromodulatory Treatment for Idiopathic or Refractory Chronic Cough
   - Low-dose, slow-release morphine
   - Gabapentin or pregabalin
   - Speech and language therapy
What’s your first step(s)?

So many options…

Make sure common problems have been addressed first

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Essential work-up

First visit

- D/C ACE-inhibitors
- D/C laryngeal irritants
  - Tobacco, caffeine, EtOH
- Hydration
- Order CXR if not done previously
- Laryngoscopy
  (+/- stroboscopy)
  - Look for glottic insufficiency
  - Look for paradoxical VF motion
- Speech language pathologist (SLP)
  - Cough suppression/management therapy
  - Vocal hygiene

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If you’re really lucky…
You will see something cool AND it may be the cause of the cough

- Glottic insufficiency
  - Vocal fold atrophy
  - Vocal fold hypomobility
- Paradoxical VF motion
- Thickened mucus
- Or something else…

Essential work-up
First visit

- If allergy/sinus symptoms:
  - Maximal medical tx x 4 weeks
  - Saline rinse, nasal steroids, antihistamines, possible abx
- Consider empiric acid suppression
  - At least 12 weeks
  - PPI 40mg daily, H2RB qhs, alginate after meals & qhs

- Then reassess 3 mos later
  - Cough gone:
    - Wean treatments
  - Cough persists:
    - Move on to other possibilities

Video courtesy of Dr. JP Giliberto
Next steps

Depends on associated symptoms and your suspicion for underlying etiology

- Potential additional workup:
  - Pulm referral
    - PFTs, chest CT, bronchoscopy, eval for Pertussis?
  - Allergy testing
  - Sinus CT without contrast
  - Reflux testing
    - pH/impedance, manometry
    - TNE/EGD
    - Eval for anti-reflux surgery

"Neurogenic cough" can be hard to diagnosis – treatment may be diagnostic and therapeutic

- Superior laryngeal nerve block
- Neuromodulators
  - Neurontin, pregabalin, TCA’s
  - Tramadol, baclofen
Summary: essential workup of chronic cough

How to know which way to go?

- Don’t forget the obvious
  - ACE inhibitors
  - Hydration
  - CXR
  - Tobacco
- Have a logical approach
  - Checklist
  - Algorithm
- Be guided by pt’s symptoms
- Be willing to think outside the box
Multi-disciplinary team = IDEAL
Working as a team to take care of our patients!

Questions?
vyvy.young@ucsf.edu