The child with a chronic cough

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Daniel P. Hsu, M.D., FS, FAAP has no relevant financial relationships with commercial interests to disclose.

Background

- Very common reason for doctor’s visit
- $$$
  - Billions of dollars spent on OTC medications
- Challenging
  - Subjective reporting
  - Perception of Parent/Teacher
  - Frequent URIs in children

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Objectives

- Discuss cough physiology
- Discuss classification of cough
- Differential DX of chronic cough
- Systematic approach to cough in the primary care clinic
- Referral to subspecialty care

Physiology of cough

- Cough is a normal response
  - Defensive mechanism designed to clear excess mucus and foreign material
  - Healthy children average ~10 episodes per day
  - Individual differences in cough receptor sensitivity
Classification of cough

- **DURATION**
- **POTENTIAL UNDERLYING DISEASE**
- **QUALITY**

**Duration**

- **Acute**
  - <2 weeks
- **Protracted or Sub-acute**
  - 2 to 4 weeks
- **Chronic**
  - >4 weeks

**Potential underlying disease**

- EXPECTED OR NORMAL COUGH
- NON SPECIFIC COUGH
- SPECIFIC COUGH

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Cough quality

- Classically recognized
  - pertussis, dry/wet cough audio clips
  - croup audio clip
  - tracheomalacia video

- Moist/productive vs. Dry

Differential Dx-chronic cough

<table>
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<tr>
<th>Medications</th>
<th>Immunology</th>
<th>GI</th>
<th>ENT/UACS</th>
<th>Genetic</th>
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<tbody>
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<td>ACE inhibitor</td>
<td>Immune deficits</td>
<td>Dysphagia/aspiration GERD</td>
<td>Chronic sinusitis Anatomic abnormality</td>
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<th>Neurologic</th>
<th>Pulmonary</th>
<th>Infectious Dz</th>
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<tbody>
<tr>
<td>Weakness/ck cough</td>
<td>Masses</td>
<td>Pertussis TB Post-WM Bronchiolitis</td>
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<tr>
<td>Malacia</td>
<td>Transient viral wheezing (≤4-5 yrs)</td>
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<tr>
<th>Mechanical</th>
<th>Cardiac</th>
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<tr>
<td>FBA TE fistula Laryngeal cleft</td>
<td>DCM PHTN</td>
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<tr>
<td>Asthma</td>
<td>Pertussis TB Post-WM Bronchiolitis</td>
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Approach to Chronic Cough

- Phase 1
  - Identify specific cough and cough that requires early referral to subspecialty
  - Obtain initial testing

- Phase 2
  - Trial of therapy
  - Reassessment

- Phase 3
  - Referral to Subspecialty

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**Detailed History**

**Gen:** FTT, dysmorphic features, NM weakness, cyanosis

**HEENT:** FB in ear, allergic shiners, transverse nasal crease, nasal polyp, posterior pharyngeal cobblestoning, situs tenderness
Physical Exam

- CV-abnormal murmur
- Chest-widened AP diameter, asymmetric breath sounds, crackles, wheezing, accessory muscle use
- Ext- digital clubbing
- Skin- eczema, hemangiomas

Specific Cough/Early Referral

- Asthma
  - Classic symptoms
    - Cough, wheeze, SOB, chest tightness, nighttime cough
  - Triggers
    - Exercise, AP, weather change, noxious odors, extremes of temperature, strong emotions
  - Quality
    - Often dry, but can be wet sounding
  - Treatment response
    - Cough has responded to bronchodilators, or steroids in the past
  - PFT
    - Evidence of obstruction, but can be normal
  - Diagnosis is challenging
    - Parental/child history may be limiting
    - Often non-specific cough

- Transient viral wheezing
  - Separate lecture
  - Under 4-5 yo, peak symptoms under 2 yo
  - Has asthma like symptoms, but only during an URI
  - Equivocal response to bronchodilators or steroids in many patients
Specific Cough/Early Referral

- **Aspiration/dysphagia**
  - Cough with drinking or eating
  - Common in neurologically impaired
    - but it does occur in otherwise normal appearing patients
  - May lead to RAD, may respond to BD/steroids
  - Need VFSS or MBS
    - [VFSS video clip]

Specific Cough/Early Referral

- **Cystic Fibrosis**
  - GI sx
    - Mec ileus, direct hyperbili, steatorhea, FTT
  - Sinopulmonary
    - Recurrent pneumonia or sinusitis

- **Primary Ciliary Dyskinesia**
  - Recurrent pneumonia, sinusitis, OM
  - 50% will have situs inversus
    - (~20% of pts with situs inversus will have PCD)

Specific Cough/Early Referral

- **Immunodeficiency**
  - Recurrent sinopulmonary infections
  - Opportunistic organisms, or unusual infections (e.g. skin)
Specific Cough/Early Referral

**Anatomic abnormalities**

- **Extrapulmonary**
  - TEF, Laryngeal clefts
  - dysphagia

- **Intrapulmonary**
  - CPAM(formerly CCAM), sequestration
  - Recurrent pneumonia in same place

**FBA**

- Cough occurs suddenly, no URI sx
- Most common age group: toddlers
- Often unwitnessed
- Lung auscultation often shows asymmetry
- CXR is neither sensitive or specific
  - (exception is a radioopaque FB)
  - Inspiratory/Expiratory or Decubitis films may help

**Characteristic or Unusual infections**

- Pertussis
  - Classic paroxysmal phase: “whooping”
- Chlamydia
  - Classic staccato cough
- TB
  - Known exposure, endemic areas
  - Systemic sx: fever, weight loss, night sweats
- Immunocompromised hosts
  - NTM, mycosis, parasites
Specific Cough/Early Referral

- **Habit Cough (psychogenic)**
  - Goes away at night
  - Distinct honking sound
  - May be associated with tic disorders
  - [Habit cough video](#)

Specific Cough/Early Referral

- **Co-morbid conditions**
  - Cardiac
    - Pulmonary HTN, s/sx of CHF
  - Neuromuscular
    - Weak cough, poor mucociliary clearance
  - Rheumatic
    - ILD, pleural effusions

Initial Testing

- **CXR**
- **Spirometry**
- **Sputum culture**
- Targeted testing for items identified on H&P
  - (e.g. PPD, VFSS, sweat chloride test)
Non-specific cough

- Asthma
- UACS
- Post infectious bronchospasm
  - Pertussis, viral LRTI
- Chronic Sinusitis
- GERD
- Protrated Bronchitis
- Habit cough
- Environmental irritant
- Hypersensitivity pneumonitis

Empiric Trial of Therapy

- Bronchodilator
  - Remember to order the appropriate spacer!
  - 1st 4 actuations need to be wasted
  - Proper technique with a mdi/spacer
  - Use prn, not scheduled

- Inhaled Corticosteroid
  - Fluticasone 110mcg, 2pf bid (44 mcg, 2pf bid)
  - Anticipatory guidance on when parents should start noticing the effects of ICS

Empiric Trial of Therapy

- Wet Cough
  - Consider use of anti-microbials
    - Cover common ENT, enteric pathogens (amoxicillin/clavulanic acid)
    - Treatment for protracted bronchitis is 14 days
    - Treatment for chronic sinusitis is 21 to 28 days
  - Consider use of anti-histamines/nasal steroids
    - Suspicion for allergic or chronic rhinitis
Empiric Trial of Therapy

- NO COUGH SUPPRESSANTS!!!

- OTC cough meds
  - Significant morbidity and some mortality
  - AAP guidelines advise against use of codeine/DM for treatment of any cough
  - Multiple reviews show no benefit

Reassess

- Generally 2 to 4 weeks

- Other considerations if no change
  - Sinus CT to r/o chronic sinusitis
  - Empiric treatment with PPI for GERD
  - Screening Labs
    - CBC, IgE, allergy RAST testing
    - Consider immune screen

Refer to Subspecialist

- Pulmonology
  - Empiric trial of BD/ICS/PPI ineffective
  - Before you obtain CT Chest

- ENT
  - FBA

- Allergy/Immunology
  - Immune evaluation
  - Allergic rhinitis-allergy immunotherapy

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Summary

- Chronic cough is defined as > 4 weeks
- History, P.E., simple screening tests can identify many causes of specific cough or conditions requiring early referral
- Give empiric trial of medicines for 2 to 4 weeks
- Reassess and refer to subspecialty

References


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