2008 UPDATE: Pediatric Upper Respiratory Tract Infections

Robert L. Deamer, Pharm.D., BCPS
Ventura County Kaiser Permanente Drug Education

Course Objectives:
At the conclusion of this presentation attendees will:
- Be familiar with recent studies on the use of common cold remedies in the pediatric populations.
- Be current on recommendations by the AAP for the management of URI in children under 3 years.
- Describe strategies in educating parents as to contraindications for using common cold and cough RXs in children under 3 years.

Speaker Disclosure
Robert L. Deamer, Pharm.D., BCPS
- Southern California Kaiser Permanente
- UCLA School of Medicine
- USC & UOP Schools of Pharmacy
- American College of Clinical Pharmacy
- American Society of Health-System Pharmacists
- Affiliated local professional societies
Pediatric Upper Respiratory Tract Infections:
- Acute otitis media
- Otitis media with effusion
- Acute Sinusitis
- Pharyngitis
- Acute Bronchitis-Cough Sx
- Common Cold

Acute Bronchitis -- Cough SX
- Definition: Inflammation of the bronchial respiratory mucosa, resulting in productive cough.
- Etiology: Viral
- Prognosis: Self-limiting
- Management: Symptomatic
**Cough...**

- Defensive reflex → 11x daily
- Persistent cough → 12+ daily > 4wks
  - 5-7% preschoolers
  - 12-15% older kids
  - ♂ > ♀ (to age 11 yr)
- Etiology:
  - Viral infection
  - Asthma
  - GERD
  - Foreign body
  - "Post-nasal drip" → Upper Airway Cough Sx

---

**The Cough Reflex**

---

**Causes of persistent cough in children:**

<table>
<thead>
<tr>
<th>Asthma</th>
<th>Conditions assoc w/ Bronchiectasis:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic infections:</td>
<td>Cystic fibrosis</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>Primary ciliary dyskinesia</td>
</tr>
<tr>
<td>Non-tuberculous mycobacteria</td>
<td>Previous severe pneumonia</td>
</tr>
<tr>
<td>Fungal infection</td>
<td>Immunodeficiency</td>
</tr>
<tr>
<td>Parasitic infection</td>
<td>Structural airway lesions</td>
</tr>
<tr>
<td>Cardiac Disease:</td>
<td>Congenital lung lesions</td>
</tr>
<tr>
<td>Pulmonary hypertension</td>
<td>Airway foreign body</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>Tracheoesophageal fistula</td>
</tr>
<tr>
<td>Interstitial Lung Disease:</td>
<td>Allergic bronchopulmonary aspergillosis</td>
</tr>
<tr>
<td>Collagen vascular disease</td>
<td>Conditions assoc w/ Hemoptysis:</td>
</tr>
<tr>
<td>Cystic drugs</td>
<td>Bronchiectasis</td>
</tr>
<tr>
<td>Prior chest radiation</td>
<td>Cardiomyopathy</td>
</tr>
<tr>
<td>Hypersensitivity pneumonitis</td>
<td>Congestive heart failure</td>
</tr>
<tr>
<td>Sarcoidosis</td>
<td>Hemoptysis</td>
</tr>
<tr>
<td>Infiltrative diseases</td>
<td>Neoplastic disease</td>
</tr>
</tbody>
</table>
Causes of chronic cough in children – 2:

**Bronchopulmonary Dysplasia**

**Neoplastic Disease**

**Conditions assoc w/ Hemoptysis:**

**Foreign bodies**

**Vascular lesions**

**Endobronchial lesions**

**Thoracic endometriosis (Catermanal disease)**

**Clotting disorders**

**Medications:**

**ACE inhibitors**

**Cytotoxic agents**

**Cough variant asthma**

**Tracheoesophageal fistula**

**Increased cough receptor sensitivity**

**Tonsillar or adenoid hypertrophy**

**Upper airway problems**

**Functional disorders**

**Environmental pollutants**

**The Common Cold**

- AKA: Acute rhinosinusitis; non-specific URTI.
- SX: Rhinorrhea, sore throat, cough, fever.
- Etiology: Rhinoviruses (100+); other viruses
- Prognosis: Self-limiting
- The Most Common Human Illness:
  - 25 million office visits per year
  - 22 million missed days of school /yr
  - 4 to 8 C&C products / household

**Cough and Cold Product Ingredients**

- Expectorant:
  - Guaifenesin
- Antitussives:
  - Dextromethorphan, Codeine; Carbetapentane
- Decongestants:
  - Pseudoephedrine → Phenylephrine
- Antihistamines:
  - Brompheniramine / Chlorpheniramine;
    Diphenhydramine / Carbinoxamine
- Analgesics:
  - Acetaminophen
Cough and Cold Medications

Adverse Events Reported:
- Death
- Convulsions
- Tachyarrhythmia
- Diminished levels of consciousness
2004-2005: >1500 children <2yo TX'd in US EDs for toxicities associated w/ C&C Meds

2005: 3 infant deaths (≤6mos age)

NO FDA-approved dosing recommendations
→ Dosages for children <2yo are UNKNOWN

AAP (1997) Systematic Reviews of Evidence:
Antitussives -- DM, codeine -- NO benefit in children


Infant deaths – Arizona Child Fatality Program -- 2006
10 deaths assoc w/ C&C products – confirmed TOX

OTC Cough and Cold Products Removed from the US Market (Oct 2008)

These products were stocked at Kaiser Permanente pharmacies but were removed from shelves on 10/1/08.

<table>
<thead>
<tr>
<th>品牌</th>
<th>成分</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durendant Plus Cough Infant Drops</td>
<td>联合止咳滴剂婴儿版</td>
</tr>
<tr>
<td>Reconstituted Infant Drops</td>
<td>再生婴儿滴剂</td>
</tr>
<tr>
<td>Little Colds</td>
<td>小儿感冒滴剂</td>
</tr>
<tr>
<td>Multi Symptom Cold Formula</td>
<td>多症状感冒配方</td>
</tr>
<tr>
<td>HotSpot</td>
<td>热点滴剂</td>
</tr>
<tr>
<td>Infant Cough and Cold DF</td>
<td>婴儿止咳感冒滴剂</td>
</tr>
<tr>
<td>Infant Cough DM Drops</td>
<td>婴儿止咳感冒滴剂</td>
</tr>
<tr>
<td>Infant &amp; Toddler Thin Sticks Decagardant</td>
<td>婴儿及儿童细棒非编码剂</td>
</tr>
<tr>
<td>Infant &amp; Toddler Thin Sticks Decagardant Plus Cough</td>
<td>婴儿及儿童细棒非编码剂加止咳版</td>
</tr>
<tr>
<td>Concentrated Infant Drops Plus Cold*</td>
<td>浓缩婴儿感冒非编码剂加止咳版*</td>
</tr>
<tr>
<td>Concentrated Infant Drops Plus Cold &amp; Cough*</td>
<td>浓缩婴儿感冒加止咳非编码剂版*</td>
</tr>
</tbody>
</table>

*These products were stocked at Kaiser Permanente pharmacies but were removed from shelves on 10/1/08.
Parents were asked: “Which of the following best describes your reaction to recent news on the safety and effectiveness of over-the-counter cold and cough medicines for children?”

Most Parents View Kids’ OTC Cold Medicines as at Least Somewhat Safe

Treating Pediatric Cough and Colds

January 2008:

- FDA: Public Health Advisory → OTC cough and cold medications NOT be used in infants and children under age 2
- FDA Public Hearing: October 2, 2008
- The American Academy of Pediatrics: → Supports FDA recommendation → Urges parents to seek safer ways to manage infants & young children cough and cold SX
Treating Pediatric Cough and Colds

- Treat underlying disorder ➔
  - Asthma; GERD; smoking/toxin exposure
- Saline nose drops + suction bulb
- Cool mist humidifier
- Chest Physiotherapy
- Analgesics ➔ APAP; ibuprofen

Treating Pediatric Cough and Colds

- Antipyretics ?
- Zinc lozenges ?
- Vitamin C ?
- Echinacea ?
- Honey ?
  - *Arch Ped Adolesc Med* 2007; 161:1140 ➔
  - • Honey vs. DM vs. no TX
  - • N=100; median age: 5yrs
  - • Honey > no TX = DM

Antibiotics for URTIs ➔ A Community Issue

- *Arch Ped Adolesc Med* 2007; 161:1140 ➔
  - • Honey vs. DM vs. no TX
  - • N=100; median age: 5yrs
  - • Honey > no TX = DM
CDC Recommends: A Decrease in Antibiotic Overuse:

- Otitis Media w/ Effusion
- Acute Pharyngitis
- Acute RhinoSinusitis
- Acute Bronchitis
- the ‘common cold’

Centers for Disease Control and Prevention, 2006

Campaign to Prevent Antimicrobial Resistance: A 12-Step Program

http://www.cdc.gov/drugresistance
Antibiotic Overuse → Reasons:
- Conclusions from 8 Focus Groups*

Patient Concerns:
- Want clear explanation
- Green nasal discharge
- Return to school

Physician Concerns:
- Diagnostic uncertainty
- Patient expects antibiotic
- Time pressure

Campaign to Prevent Antimicrobial Resistance:
A 12-Step Program

http://www.cdc.gov/drugresistance

2008 UPDATE:
Pediatric Upper Respiratory Tract Infections

Robert L. Deamer, Pharm.D., BCPS
Ventura County Kaiser Permanente Drug Education