

Chapter 5

Cough, Cold, and Congestion

Desmond Fitzpatrick and Hasan Rasheed

5.1 Introduction

The common cold is a benign, self-limited, acute viral infection with associated symptoms of sneezing, rhinorrhea, nasal congestion, cough, and malaise. It is the most frequent acute illness in the industrialized world [1]. Adults typically have two to three episodes of illness yearly while children can have up to five [2]. The common cold is typically caused by viruses (including rhinovirus, RSV, coronavirus, and others), and often, no infecting organism is detected [2].

The differential diagnosis for cough, cold, and congestion is broad: ranging from non-emergent causes such as rhinitis to life-threatening illnesses such as pulmonary embolism. The primary objective when evaluating patients who have acute cough complaints is often to exclude pneumonia [3]. However, the goal of the emergency physician is to differentiate non-emergent causes from emergencies such as pulmonary embolism, CHF exacerbation, COPD exacerbation, etc. A thorough history and physical examination are important to guide diagnosis, and vital sign abnormalities can often distinguish these illnesses. The American College of Chest Physicians has defined three categories of cough based on duration. Acute cough lasts less than 3 weeks, while a subacute cough lasts 3–8 weeks, and a chronic cough lasts more than 8 weeks [4].

Again, careful assessment is necessary as misidentification can lead to inappropriate discharge of potentially lethal conditions.

D. Fitzpatrick, MD (✉)

Department of Emergency Medicine, University of Florida-Gainesville, Gainesville, FL, USA
e-mail: defitzpatrick@ufl.edu

H. Rasheed, MD

Department of Emergency Medicine, Shands at University of Florida Health,
Gainesville, FL, USA
e-mail: rasheedh@ufl.edu

5.2 Risk Factors for Cough, Cold, and Congestion

- Transmission of common cold occurs most through hand-to-hand contact.
- Malnutrition.
- Cigarette smoking.
- Immunodeficiency.
- Extremes of age.

5.3 Differential Diagnosis [3]

- *Acute*
 - Bacterial sinusitis
 - Bronchitis:
 - 1–5 days of fevers, malaise, and myalgias followed by persistent cough, phlegm production, and possible wheezing lasting 1–3 weeks
 - Influenza:
 - Cough + sudden onset of high fever (>101 F), headache, myalgias, and fatigue
 - Rhinitis
 - Pharyngitis (viral)
 - Asthma exacerbation
- *Don't miss*
 - Pneumonia
 - Pulmonary embolism
 - COPD exacerbation
 - CHF
 - Scarlet fever
 - Acute epiglottitis or supraglottic inflammation
 - Peritonsillar abscess
 - Gonococcal pharyngitis
 - Kawasaki disease
 - Diphtheria
- *Chronic*
 - *Gastrointestinal:*
 - GERD
 - *Pulmonary:*
 - COPD
 - Smoking

- Cough variant asthma
- UACS – upper airway cough syndrome
- Post-viral cough
- *Drug induced:*
 - ACE inhibitor
 - Cocaine
 - Methamphetamines
 - Beta-blockers
 - Chlorpromazine
 - NSAIDs, aspirin, and OCPs

5.4 Common Complaints and Red Flags* of Chronic CCC **[(*) = Common]**

- Cough
- Congestion and/or rhinorrhea
- Conjunctivitis
- Fever – uncommon in adults but common in children
- Hemoptysis*
- Malaise
- Myalgias
- Nausea/vomiting
- Pleuritic chest pain
- Recurrent infections*
- Severe chest pain*
- Sore throat
- Syncope*
- Weight loss*

5.5 History

When evaluating a patient with this complaint, the emergency physician can use details from patient history to differentiate common cold from conditions that require antibiotics as well as emergent conditions.

Important historical features to elicit include:

- Duration of symptoms:
 - Acute vs. subacute vs. chronic
- The presence of potential secondary factors (correlate with past medical history) [* = red flags]:

- Acute medical complaints (or acute exacerbations of chronic medical conditions):
 - Headache
 - Shortness of breath (*)
 - Chest pain (*)
 - Signs and symptoms of diabetes mellitus (*):
 - Polyuria/polydipsia
 - Abdominal pain or discomfort (*)
- Use of medications or drugs (including tobacco and alcohol)
 - Pitfall: not inquiring about over-the-counter medications which may contain stimulants

5.6 Duration of Symptoms [2]

- *Acute cough (<3 weeks)*:
 - Most commonly seen with common cold but also seen in emergencies such as pneumonia, CHF exacerbation, COPD exacerbation, and pulmonary embolism.
 - The most important step in evaluation of acute cough is for the emergency physician to differentiate between benign and serious conditions.
- *Subacute cough (3–8 weeks)*:
 - Most often follow an upper respiratory infection.
 - If not, postinfectious, should be treated as chronic cough.
 - Usually postinfectious cough that is caused by postnasal drip, upper airway irritation, and mucus accumulation of bronchial hyperresponsiveness due to asthma.
 - Consider allergen/irritant exposure, pneumonia, or chronic bronchitis exacerbation.
 - Antitussives can be used when necessary.
- *Chronic cough (>8 weeks)*:
 - Can have multiple causes including upper airway cough syndrome (UACS), asthma, non-asthmatic eosinophilic bronchitis, and GERD.
 - Important to optimize therapy for each diagnosis and check compliance with treatment and maintenance of all effective therapies.
 - Further outpatient investigations will likely be needed for management.

5.7 Physical Exam

The physical examination should focus on potential emergency conditions for the reported cough, cold, and congestion.

- Vital sign assessment:
 - The presence of fever or hypothermia should alert the physician to a possible infectious etiology.
 - Tachycardia may have multiple etiologies including:
 - An appropriate response to fever
 - The potential use of medications or drugs, including over-the-counter medications and illicit substances
 - Pulse oximetry:
 - May alert the clinician to the presence of an underlying pulmonary pathology
- Neurologic assessment should focus on:
 - Level of alertness
- Head, eyes, ears, nose, and throat examination:
 - Note evidence of trauma:
 - For example, battle and raccoon signs
 - Pupillary size and reactivity:
 - May be important in evaluation for withdrawal or acute ingestions
- Cardiovascular and pulmonary examination:
 - Specifically, for acute conditions including angina, flash pulmonary edema, or exacerbations of asthma or COPD
- Gastrointestinal examination:
 - The presence or absence of abdominal pain, vomiting, or diarrhea
- The presence or absence of purulent sputum is not an accurate predictor of bacterial infection [3].

5.8 Introduction to Treatment

After evaluation and stabilization of emergency conditions, the emergency physician has several medication options to treat patients. These include:

1. Medication management introduction:

(a) Considerations for medication management include:

- (i) Using the lowest effective dose
- (ii) Use of the medication on an intermittent basis
- (iii) Prescription of enough medication for a short-term basis only
- (iv) Avoiding antibiotics in uncomplicated cases of URI
- (v) Consideration of chronic medical conditions that may increase the side effects of the prescribed medication – specifically the sedative side effects

5.9 Non-pharmacologic Treatment

Nasal saline irrigation may reduce the need for pain meds and improve overall comfort; however, there have been mixed results with regard to benefit as some trials have shown that this causes more irritation. A systematic review from 2015 has concluded symptomatic relief, but studies were small with high risk of bias [5]. In a systemic review and meta-analysis of six trials, it was found that inhalation of humidified air or steam has been found to reduce symptoms but did not change viral shedding or create other objective clinical improvement [6]. Warm tea and chicken soup may further help to provide symptomatic relief and comfort for patients.

5.10 Pharmacologic Treatment

There are several over-the-counter medications that can be used for the symptomatic treatment of cough, cold, and congestion. While it is easy to inform patients of over-the-counter medications, it is also imperative to be aware of possible pitfalls and side effects of these medications. Over-the-counter medications often have serious side effects in children, with no proven benefit over placebo [7].

5.11 Analgesics

Analgesics

NSAIDs

Aspirin

Acetaminophen

Several studies have looked at NSAIDs and acetaminophen in symptomatic relief (headache, otalgia, myalgias, etc.), and it has been found that NSAIDs and acetaminophen were more effective than placebo at relieving symptoms [8]. Aspirin and acetaminophen were equally effective [8]. Short courses are usually considered to be safe.

Pitfalls

1. Watch for signs of toxicity including GI, CNS, and renal systems.
2. Patients may present with chronic overdose as well.

5.12 Antihistamines

Antihistamines

Diphenhydramine

Cetirizine

Loratadine

First-generation antihistamines can help alleviate rhinorrhea and sneezing; however, they are sedating. Second-generation antihistamines are often less sedating. A Cochrane Review found that antihistamines were more effective than placebo in the first 2 days of treatment, but had little to no improvement of symptoms after 6–10 days [9]. Combination of antihistamines with decongestants may be more beneficial [10].

Pitfalls

1. Have anticholinergic effects, beware of overdose.
2. May cause CNS depression.
3. Sedating, second-generation antihistamines are less sedating.

5.13 Decongestants

Decongestants

Oxymetazoline

Phenylephrine

Pseudoephedrine

Topical and oral decongestants can help relieve nasal congestion secondary to the common cold [10].

Pitfalls

1. Overdose can cause sympathomimetic toxidrome including hypertension, seizures, tachycardia (or reflex bradycardia), mydriasis, diaphoresis, agitation, and altered mental status.
2. Can lead to cardiac arrhythmia in overdose.
3. Increase risk for rhabdomyolysis in overdose.
4. Mixed preparations can lead to overdose of other medications (IE acetaminophen or salicylates).
5. Limit topical decongestant use to 2–3 h to prevent rebound rhinitis, including complications such as epistaxis, agitation, insomnia, and worsened hypertension [10].

5.14 Antitussives

 Antitussives

 Dextromethorphan

 Codeine

 Benzonatate

Antitussives are not recommended by the American College of Chest Physicians for cough secondary to URIs. This therapy is rarely necessary in the initial stages with variable outcomes in the later course of infection. Dextromethorphan was found to modestly decrease cough severity and frequency in a systematic review [11]. Codeine is the traditional opiate for cough suppression and was more effective than placebo in reducing severity and frequency of cough [11]. Benzonatate anesthetizes the stretch receptors of the lungs and pleura and is more effective when combined with guaifenesin [4].

Pitfalls

1. Do not take dextromethorphan concurrently or within 2 weeks of discontinuing MAO inhibitors.
2. Dextromethorphan can cause CNS symptoms including serotonin syndrome, confusion, excitement, irritability, and nervousness.
3. Codeine can cause CNS depression, constipation, hypotension, and respiratory depression. Be careful prescribing to pediatrics, debilitated patients, and elderly.
4. Benzonatate can lead to hallucinations as well as hypersensitivity reactions such as bronchospasm, cardiovascular collapse, and laryngospasm.
5. Benzonatate has also led to overdose in children younger than 10 years of age. Signs of overdose in children include restlessness, tremors, convulsion, coma, and cardiac arrest. It is not approved for use in children younger than 10 years of age.

5.15 Expectorants

Mucolytics

Guaifenesin

Expectorants help to thin secretions and may promote clearance of drainage. A systematic review from 2014 showed no good evidence for or against effectiveness of OTC medications, such as guaifenesin, for acute cough [12].

Pitfalls

1. Increases sedative effectives of alcohol, sleeping pills, muscle relaxers, and anesthetics
2. Can cause nausea, vomiting, and diarrhea
3. Increases the risk of kidney stone formation

5.16 Antibiotics and Antivirals

Antibiotics and antivirals

Amoxicillin-clavulanate

Doxycycline

Tamiflu

Antibiotic therapy for uncomplicated URI may cause more harm than benefit [13]. When compared to placebo in a systemic review of randomized trials, patients with URI symptoms of less than 7 days did not have a change in symptom persistence in antibiotic and placebo groups, with antibiotic groups having great risk of adverse effects [14]. Per the Infectious Disease Society of America, 5–7-day courses of empiric antibiotics are recommended for treatments of signs and symptoms that are:

- (a) Persistent and not improving (>10 days)
- (b) Severe (≥ 3 –4 days)
- (c) Worsening or “double-sickening” (≥ 3 –4 days) [15]

Amoxicillin-clavulanate 500–125 mg TID or 875–125 mg BID is recommended rather than amoxicillin alone as empiric therapy [15]. Doxycycline can be used for patients allergic to penicillin [15]. Macrolides or second-/third-generation cephalosporins are not recommended for empiric therapy because of high resistance to *S. pneumoniae* [15]. Trimethoprim-sulfamethoxazole is not recommended for empiric therapy because of high resistance among both *S. pneumoniae* and *H. influenzae* [15].

If a patient presents with <48 h since onset of symptoms for influenza, consider Tamiflu 75 mg BID \times 5 days (2 mg/kg BID \times 5 days in children).

People at high risk, which should have treatment for influenza, include the following [16]:

- Residents of nursing homes or chronic care facilities
- Adults \geq 65 years of age
- Native Americans and Alaska Natives
- Morbidly obese patients
- Pregnant women and women up to 2 weeks postpartum
- Chronic medical conditions including:
 - Cardiovascular disease
 - Active malignancy
 - Chronic renal insufficiency
 - Chronic liver disease
 - Diabetes
 - Hemoglobinopathies
 - Pulmonary disease (including asthma)

References

1. Kirkpatrick GL. The common cold. *Prim Care*. 1996;23:657.
2. Coughlin L. Cough: diagnosis and management. *Am Fam Physician*. 2007;75(4):567–75.
3. Buttaravoli PM, Leffler SM. Minor emergencies. Philadelphia: Elsevier/Saunders; 2012. p. 221–6.
4. Silvestri RC, Weinberger SE. Treatment of subacute and chronic cough in adults. UpToDate, 05 May 2015. Web. 03 Feb 2016.
5. King D, Mitchell B, Williams CP, Spurling GK. Saline nasal irrigation for acute upper respiratory tract infections. *Cochrane Database Syst Rev* 2015: CD006821.
6. Singh M, Singh M. Heated, humidified air for the common cold. *Cochrane Database Syst Rev*. 2013; (6):CD001728.
7. Pappas, D. The common cold in children: Management and prevention. UpToDate, 01 June 2016. Web. 03 June 2016.
8. Bachert C, Chuchalin AG, Eisebitt R, et al. Aspirin compared with acetaminophen in the treatment of fever and other symptoms of upper respiratory tract infection in adults: a multicenter, randomized, double-blind, double-dummy, placebo-controlled, parallel-group, single-dose, 6-hour dose-ranging study. *Clin Ther*. 2005;27:993.
9. De Sutter AI, Saraswat A, van Driel ML. Antihistamines for the common cold. *Cochrane Database Syst Rev*. 2015;11:CD009345.
10. Sexton DJ, McClain MT. The common cold in adults: Treatment and prevention. UpToDate, 05 Apr 2016. Web. 27 May 2016.
11. Yancy Jr WS, McCrory DC, Coeytaux RR, et al. Efficacy and tolerability of treatments for chronic cough: a systematic review and meta-analysis. *Chest*. 2013;144:1827.
12. Smith SM, Schroeder K, Fahey T. Over-the-counter (OTC) medications for acute cough in children and adults in community settings. *Cochrane Database Syst Rev* 2014: CD001831.
13. Harris AM, Hicks LA, Qaseem A. High value care task force of the American College of Physicians and for the Centers for Disease Control and Prevention. Appropriate antibiotic use

for acute respiratory tract infection in adults: advice for high-value care from the American College of Physicians and the Centers for Disease Control and Prevention. *Ann Intern Med.* 2016;164:425.

14. Kenealy T, Arroll B. Antibiotics for the common cold and acute purulent rhinitis. *Cochrane Database Syst Rev.* 2013;(6):CD000247.
15. Chow AW, Benninger MS, Brook I, Brozek JL, Goldstein EJ, Hicks LA, Pankey GA, Seleznick M, Volturo G, Wald ER, File Jr TM. IDSA clinical practice guideline for acute bacterial rhinosinusitis in children and adults. *Clin Infect Dis.* 2012;54(8):e72–112.
16. Zachary, KC. Treatment of seasonal influenza in adults. *UpToDate*, 10 May 2016. Web. 27 May 2016.