

## Family Medicine Preceptorship Discussion Cases Cough

### **Learning Objectives:**

- Discuss the differential diagnosis of cough
- Define appropriate use of diagnostic tools such as chest x-ray in patients presenting with cough
- Discuss appropriate treatment regimens for patients presenting with cough

### **Suggested Readings:**

ACCP Evidence-Based Practice Guidelines, “Diagnosis and Management of Cough Executive Summary”: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3345522/>

Kinkade, S. & Long, N.A. “Acute bronchitis.” *Am Fam Physician*, 2016 Oct 1;94(7):560-565. <http://www.aafp.org/afp/2016/1001/p560.html>

Benich III, J. J. & Carek, P. J. “Evaluation of patient with Chronic Cough.” *Am Fam Physician*, 2011 Oct 15;84(8):887-892. <http://www.aafp.org/afp/2011/1015/p887.html>

### **Case 1:**

Cyndi is a 30-year-old female who presents to your clinic for evaluation of cough and fever. She developed a productive cough about 7 days ago, and she reports symptoms are worsening. She reports fever for the last 3 days, as well as fatigue and poor appetite. She has some dyspnea on exertion. Vital signs show a tired-appearing female, temperature is 38.3 C, respiratory rate is 20, SpO<sub>2</sub> is 98% on room air, cardiac exam is unremarkable, lung auscultation reveals diminished breath sounds and rales over posterior left lower lung field. She has missed the last 2 days of work due to overall unwell feeling.

**Question 1:** What is the differential diagnosis of cough? What additional aspects of the history are important to consider when evaluating a patient with a cough?

*The differential diagnosis of cough is broad, and includes (but is not limited to) infectious etiology, airway inflammation, obstructive/restrictive airway disease, upper airway cough syndrome, GERD, and medication side-effects. It is important to clarify known past medical history (history of heart problems, lung problems, GERD, allergies), onset, duration, timing, accompanying symptoms (such as fever, dyspnea, chest pain), and sick contacts. Note that sputum production does not correlate with bacterial infection, however bloody or rust-colored sputum production should prompt further investigation with chest radiography.*

**Question 2:** What aspects of the physical examination are important in evaluation of cough?

*Vital signs (particularly pulse oximetry, respiratory rate, and heart rate), lung auscultation, cardiovascular exam (including inspection for jugular venous distension [JVD] or edema, auscultation for murmurs), and HEENT exam are key aspects of the examination*

**Question 3:** What additional testing is needed, if any, in evaluation of patients with cough?

*Chest x-ray should be considered in patients with chronic cough (>8 weeks), or patients with cough accompanied by dyspnea, bloody/rust-colored sputum, fever, respiratory rate >24, pulse >100, lung exam findings concerning for consolidation. Respiratory pathogen testing (influenza,*

*Bordetella pertussis, respiratory viral panel) can be obtained if history is consistent and if it will alter management.*

Question 4: What is likely the cause of Cyndi's cough?

*She likely has a lobar pneumonia, given her history and exam. She should undergo a chest x-ray and be treated with appropriate antibiotics if there are radiographic signs of pneumonia.*

**Case 2:**

Oliver is a 3-year-old healthy male child with a cough present for the last week. Cough is non-productive, and is accompanied by rhinorrhea and sore throat. He had a fever a few days ago, but this has resolved. He attends daycare with 15 other children. Oliver's mother tells you that he is overall acting normally, but he is coughing a lot during the day and night. He is fully immunized. Oliver is playful and appears well on exam, and is in no respiratory distress. Lung auscultation is unremarkable, vital signs are all within normal limits. He has an occasional barking cough.

Question 1: What is the likely diagnosis?

*This is acute bronchitis, which is almost certainly secondary to a viral upper respiratory tract infection.*

Question 2: What is the best treatment for this patient's cough?

*The Choosing Wisely campaign and AAP recommend AGAINST using over-the-counter cough and cold medications in children younger than 4 years of age. Additionally, based on the patient's presentation there is also no indication for antibiotic treatment at this time.*

Question 3: How would management change if Oliver's cough persisted without improvement for 3 weeks and he developed paroxysmal coughing with post-tussive emesis?

*At that point it is reasonable to test and/or treat for pertussis*

**Case 3:**

John is a 40-year-old man with history of hypertension, allergic rhinitis, and obesity, who presents with a cough that has been present for about 6 months, and has worsened over the last two weeks. John is a non-smoker. He has taken lisinopril 10 mg daily for hypertension for the last 9 months. He reports no known personal or family history of asthma. He denies wheezing or productive cough. He does not report any heartburn symptoms. He has no pets at home. He reports taking diphenhydramine (Benadryl) as needed some days when he feels very congested, but denies daily antihistamine use. Lung auscultation reveals no abnormal breath sounds or wheezes, and HEENT exam reveals edematous nasal mucosa and "cobblestone" appearance of the oropharynx.

Question 1: What is the differential diagnosis for John's cough?

*Differential is broad in this case. Most likely causes in this case include ACE inhibitor cough, upper airway cough syndrome, and GERD. Symptoms were not present prior to initiation of*

*lisinopril so he could have an ACE inhibitor-related cough. He has no overt heartburn symptoms, but GERD can occur without symptoms. He also has signs of upper airway cough syndrome and known allergic rhinitis which could be contributing.*

**Question 2:** What testing is needed for this patient?

*In a patient with cough lasting longer than 8 weeks, you should consider obtaining a chest x-ray.*

**Question 3:** What is the best treatment for John's cough?

*The clinician can go about treating in multiple ways. One option would be to discontinue the ACE inhibitor and see whether the cough improves. Another option is to treat for upper airway cough syndrome by better-controlling the patient's allergic rhinitis symptoms, since he has signs on exam of "cobblestone" appearance of oropharynx. A trial of treatment for GERD and/or asthma may also be warranted.*

**Case 4:**

Mary is a 64-year-old woman with history of obesity, HTN, type 2 diabetes, and COPD, who presents with a worsening cough and dyspnea for the last 8 weeks. Mary has smoked 1 pack per day of tobacco cigarettes for the last 45 years. She has some mild dyspnea at baseline, but thinks her symptoms are worse during the last 8 weeks. She reports that she is coughing up whitish sputum, which is occasionally blood tinged. She has some wheezing. She reports that she has had new hoarse voice for the last 6 weeks. She has been having some low grade fevers at home, lightheadedness, and reports feeling fatigued for a couple of months. Lung exam reveals diminished breath sounds and scattered wheezes.

**Question 1:** What is the differential diagnosis for Mary's cough?

*Given her risk factors (smoking history) and associated symptoms (dyspnea, fatigue, new chronic hoarse voice, and hemoptysis) you should have concern for potential lung cancer. Cannot rule out COPD exacerbation, pneumonia, or pulmonary embolism, but this patient ultimately requires workup for malignancy*

**Question 2:** What testing is needed for this patient?

*Mary initially needs a chest x-ray, and will also need a CT chest.*