

**Internal Medicine Clerkship**  
Case Discussions

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**Cough and Upper Respiratory Infections**  
Student Guide

**Objectives:**

1. Identify characteristics and relevant review of systems that define cough including upper respiratory symptoms, lower respiratory symptoms, GERD symptoms, and constitutional symptoms.
2. Assess past medical history for risk factors and predisposing conditions including causative medications, asthma, COPD, GERD, and allergies.
3. Assess for social risk factors including tobacco and environmental and occupational exposures.
4. Identify key physical exam findings that may:
  - a. Determine level of respiratory distress including respiratory rate.
  - b. Assess for signs of pulmonary consolidation and obstruction including wheezes, rhonchi, and rales.
  - c. Determine presence of upper respiratory findings including post-nasal drip and bacterial sinusitis.
5. Identify and interpret key laboratory and imaging tests and list indications, benefits, test characteristics, risks, and costs of testing that determine need for a chest x-ray in certain cases (including prolonged cough) and need for lung function tests when considering certain diagnoses (including asthma).
6. Develop and prioritize a differential diagnosis including common diagnoses and non-to-miss diagnoses and use the timing of the cough (e.g. acute, subacute, and chronic) to guide this differential.
7. Describe a rational and evidence-based approach to treating a patient with cough:
  - a. Identify the necessity for urgent treatments including bronchodilators, antibiotics, and diuretics.
  - b. Identify empiric treatments including upper airway cough syndrome treatment and proton pump inhibitors.
8. Identify characteristics and relevant review of systems that may suggest an upper respiratory infection including fever, rhinorrhea, nasal congestion, cough, andodynophagia.
9. Assess past medical history for exacerbating factors or disease including seasonal allergies, COPD, and immunosuppression.
10. Assess for social risk factors and predisposing conditions including tobacco use, sick contacts, and travel.
11. Identify key physical exam findings:
  - a. Determine upper respiratory characteristics including findings on conjunctival, nasal, oral, lymph node, and sinus exams.
  - b. Determine lower respiratory characteristics including findings on pulmonary exam.
  - c. Determine presence of commonly confused diagnoses including bacterial sinusitis and Streptococcal pharyngitis.
12. Identify and interpret key laboratory and imaging tests and list indications, benefits, test characteristics, risks, and costs of testing:
  - d. Determine underlying etiology including influenza PCR and viral panel.
  - e. Determine underlying severity including chest x-ray and complete blood count.

- f. Determine presence of commonly confused diagnoses including rapid antigen detection test for Streptococcus.
13. Describe a rational and evidence-based approach to treating a patient with an upper respiratory infection and list specific factors that dictate when to treat (including presence of associated bacterial infection or acute influenza).
14. Describe possible complications including acute otitis media, sinusitis, and lower respiratory tract infection.
15. Describe the prevention of upper respiratory infections including hand washing and annual influenza vaccination.

### **Clinical Case 1:**

A 43yo presents to clinic with complaint of cough for the last week. She notes some sore throat, rhinorrhea, and nasal congestion. She reports she is coughing up yellowish mucous. She denies fevers. She has a history of asthma but has not been on medications since she was a child, and she reports seasonal allergies as well. She notes that her two young children had similar symptoms about one week ago.

On exam her vitals are normal, and she is afebrile. Her BMI is 28. Her exam is notable for clear discharge in both nares and mild oropharyngeal erythema, but her tonsils are normal. There is no palpable cervical lymphadenopathy. Her lungs are clear to auscultation, and her cardiac exam is normal.

### **Questions:**

1. Define the time course of an acute cough and list the differential for an acute cough.
2. What are the common causes of upper respiratory infections in a patient like this?
3. Would you perform any additional testing at this time? What if she presented in January? Would you consider testing her for Group A strep, why or why not? (Hint: think about the Centor Criteria <https://www.mdcalc.com/calc/104/centor-score-modified-mcisaac-strep-pharyngitis>)
4. How would you manage this patient at this time?
5. Would you recommend any preventive strategies for future similar infections?
6. The patient expresses concern that she will develop a sinusitis as she has in the past. How would you counsel her regarding possible complications of upper respiratory infections.

The patient returns a week later and comments that most of her symptoms have resolved except she is still coughing and feels a little tight in her chest. She had an old albuterol inhaler which she tried, and it helped her symptoms. In addition, she used her daughter's peak flow monitor and noted her flow to be at 300. On exam her vitals are normal, pulse oximetry is 96%, and you now hear mild expiratory wheezing, but the remainder of her exam is normal.

**Questions:**

7. What is a normal peak flow and what does her peak flow suggest?
  
8. Are there any parts of the exam that you would pay extra attention to?
  
9. How would you counsel the patient regarding her current condition, and how would you treat her? What are other common triggers for her current situation?
  
10. Patient asks if she should use her daughter's nebulizer as well. How would you respond?

**Clinical Case 2:**

53yo with hx of hypertension and overweight presents with chronic cough for the last two months. She says it happens throughout the day but sometimes seems worse at night. She has tried over the counter cough medication without relief. It is not interfering with her ability to exercise, and she does not feel short of breath when she exercises. She smoked a quarter pack a day for ten years when she was younger but quit twenty years ago. She recently moved from a house to a condo. She has no pets and has not recently traveled. Her medications including 5mg amlodipine and 10mg lisinopril.

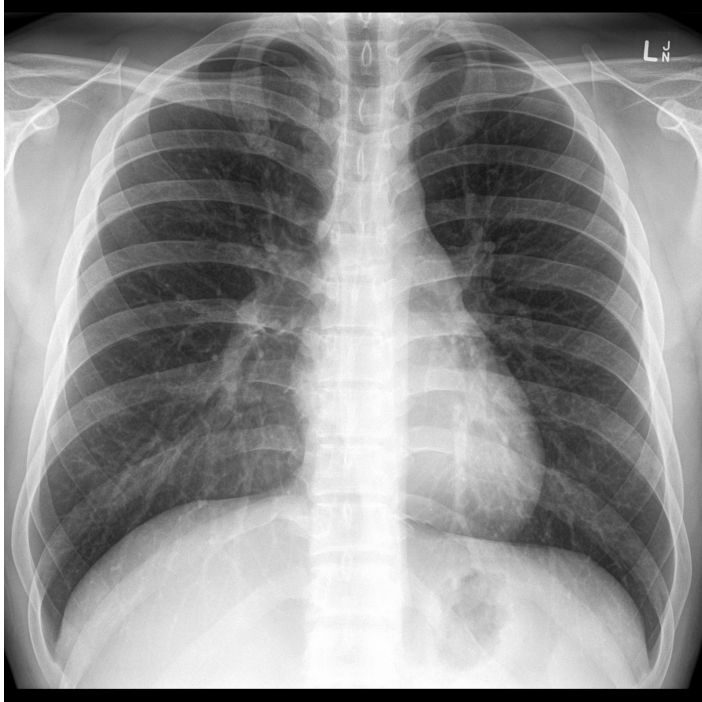
On exam, her vitals are normal and pulse oximetry is 98%. Her HEENT exam reveals mild swelling and paleness of her turbinates with clear discharge and cobblestoning of her posterior oropharynx. Her lungs are clear to auscultation, and her cardiac exam is normal. Her nails do not show clubbing.

**Questions:**

1. Define the time course of a subacute cough and chronic cough and list the differential for each.
  
2. Is there any additional history you would like to ask the patient?

3. What is most likely causing this woman's cough and how would you evaluate her?

The patient's lisinopril is converted to hydrochlorothiazide. She denies any additional symptoms related to GERD. She obtains a chest radiograph pictured below:

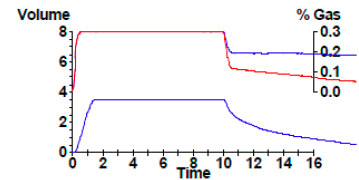
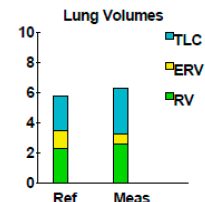
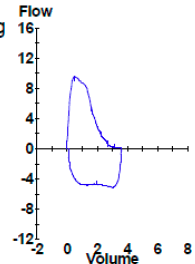


**Questions:**

4. Her cough does not improve one month after stopping the lisinopril. What would you do next for this patient?
  
5. If the patient does not improve with your treatment from question 4, what would you do next?

The patient goes on to obtain pulmonary function tests and the results are depicted below. The report also notes that she had a normal methacholine challenge test.

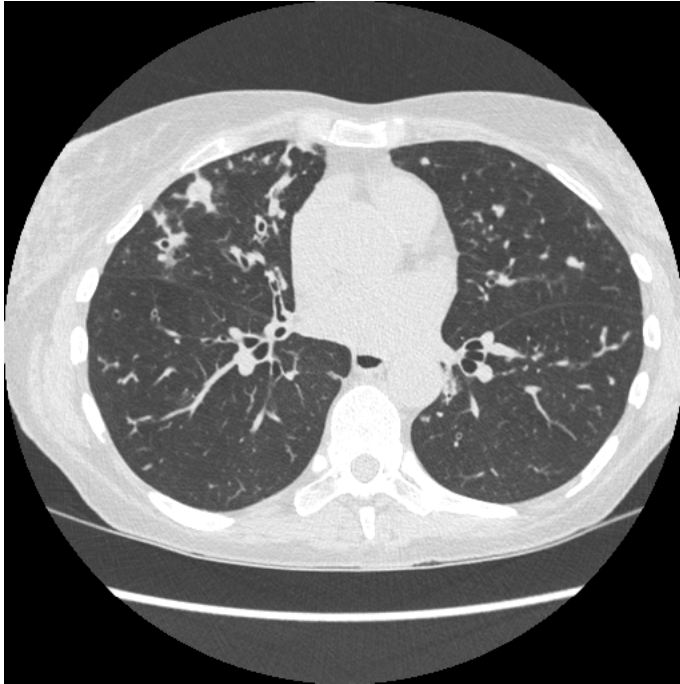
		Pre	Ref	LLN/ULN	% Ref	Post	% Ref	% Chg
<b>Spirometry</b>								
FVC	Liters	3.62	3.79	(3.0 - 4.6)	96			
FEV1	Liters	2.77	2.92	(2.2 - 3.6)	95			
FEV1/FVC	%	77	77	(67.6 - 87.2)				
FEF25-75%	L/sec	2.34	2.49	(1.1 - 3.9)	94			
PEF	L/sec	9.53	6.84	(4.9 - 8.8)	139			
FET100%	Sec	14.89						
FIVC	Liters	3.54						
FIF50%	L/sec	4.65						
PIF	L/sec	5.11						
<b>Lung Volumes</b>								
TLC	Liters	6.25	5.73	(4.7 - 6.8)	109			
VC	Liters	3.68	3.79	(3.0 - 4.6)	97			
IC	Liters	3.16						
FRC PL	Liters	3.09	3.28	(2.2 - 4.3)	94			
ERV	Liters	0.65	1.19	(1.0 - 1.4)	55			
RV	Liters	2.56	2.27	(1.5 - 3.0)	113			
RV/TLC	%	41	41	(29.6 - 51.6)				
Vtg	Liters	3.06	2.81	(1.9 - 3.8)	109			
<b>Diffusing Capacity</b>								
DLCO	mL/mmHg/min	22.4	26.3	(18.0 - 34.6)	85			
DL Adj	mL/mmHg/min	22.4	26.3	(18.0 - 34.6)	85			
DLCO/VA	mL/mHg/min/L	4.20	5.00	(3.7 - 6.3)	84			
DL/VA Adj	mL/mHg/min/L	4.20	4.41		95			
VA	Liters	5.34	5.77	(5.0 - 6.5)	92			
IVC	Liters	3.56	3.62	(3.3 - 4.0)	98			
BHT	Sec	10.38						



**Questions:**

- How would you counsel the patients regarding these results? What additional data does the methacholine challenge provide? What would you do next for the patient?

The patient goes on to get a high resolution CT scan that demonstrates the below:



**Questions:**

7. How would you counsel the patient regarding these findings?

**References:**

Harrison's Principles of Internal Medicine, 22e. Chapter 40: Cough  
<https://accessmedicine-mhmedical-com.archer.luc.edu/content.aspx?bookid=3095&sectionid=262790407>

Harrison's Principles of Internal Medicine, 22e. Chapter 298: Asthma  
<https://accessmedicine-mhmedical-com.archer.luc.edu/content.aspx?bookid=3541&sectionid=294354591>

Harrison's Principles of Internal Medicine, 22e. Chapter 297: Diagnostic Procedures in Respiratory Disease  
<https://accessmedicine-mhmedical-com.archer.luc.edu/content.aspx?bookid=3541&sectionid=294354507>

Symptom to Diagnosis: An Evidence-Based Guide, 4e. Part 10: Cough and Congestion  
<https://accessmedicine-mhmedical-com.archer.luc.edu/Book.aspx?bookid=2715#228238879>

<https://radiopaedia.org/cases/normal-frontal-chest-x-ray?lang=us>

<https://radiopaedia.org/articles/pulmonary-mycobacterium-avium-complex-infection?lang=us>