Case Description:

A 44 year old woman with no significant past medical history was seen in clinic following two recent emergency department (ED) visits and diagnosis of pneumonia. One week earlier, she reported an insidious onset of dry cough, nasal drainage, frontal fullness, and headache. She denied fevers, chills, or hemoptysis. Her cough increased in frequency and ultimately included pain in her upper chest and shortness of breath during coughing episodes which prompted her visit to the ED. Her initial evaluation was remarkable only for a heart rate of 104. All other vitals, physical examination, EKG, and CXR were normal. A CT chest with pulmonary embolism protocol (CTPE) was performed which showed a small right upper lobe finding, interpreted by the radiologist as a possible nodule but most likely atelectasis. As a result of the CT finding, the patient was diagnosed with community acquired pneumonia and discharged home on Azithromycin. The following day her cough and shortness of breath persisted so she returned to the ED. Other than a transiently elevated respiratory rate that resolved spontaneously, a repeat evaluation including labs and CXR were normal. However, because the patient’s cough had not improved, she was diagnosed with “complicated pneumonia” and discharged home with additional prescriptions for Amoxicillin/Clavulanate and a 10 day course of Prednisone. When seen at follow up three days later she was feeling much better with improved cough, but complained of anxiety, difficulty concentrating, and insomnia since starting the prednisone. Her vitals and physical examination were normal. She was seen two days later with resolution of all symptoms without any further complaints.

Discussion:

The clinical example above illustrates how each patient interaction contains multiple decision points where there are opportunities for care and risks for
harm. Often times harms occur via over-testing, over-diagnosis, and over-treatment, each of which this patient experienced.

First, in spite of pulmonary embolism (PE) being an unlikely cause of her symptoms, its work up was pursued aggressively in the ED with a CTPE study – an example of over-testing. Based on the patient’s presentation her Well’s score was 1.5 placing her symptoms in the low risk category for pulmonary embolism. For patients with low risk for PE, the preferred next step in diagnosis is D-dimer testing. If negative, a D-dimer, has a greater than 99% negative predictive value which permits avoidance of CT-PE imaging and the attendant risks of radiation, contrast, and incidental findings. For this patient, no D-dimer was obtained and the CT scan identified an indeterminate upper lobe finding. This led to the diagnosis of pneumonia despite little other supporting evidence. Additionally, the CT-scan finding influenced further clinical decisions, namely the broadening of antibiotics, addition of corticosteroids for persistent symptoms, and unnecessary screening for tuberculosis.

Over-diagnosis and over-treatment occurred during her second visit to the ED. Because her symptoms had not improved, she was diagnosed with complicated pneumonia and the treatment plan was expanded with extended spectrum antibiotics and oral corticosteroids. The Infectious Diseases Society of America/American Thoracic Society consensus guidelines for treatment of pneumonia indicate that no response to antibiotics in the first 72 hours can be normal, and, unless there is marked clinical worsening, antibiotics should not be changed until after 72 hours. Additionally, according to a study in 2010, oral prednisone has little to no benefit in the treatment of community acquired pneumonia.

Finally, not only does over-testing portend the harm of over-diagnosis and over-treatment, it also opens the door for medical errors. For this patient, it happens that she was given the wrong dose of oral prednisone due to a prescription labeling error, and was given an excess amount of Tuberculosis PPD solution. Fortunately, no adverse effects resulted from these medical errors.
Conclusions: From the time of the initial assessment, to final condition resolution, management of every patient includes a series of clinical decisions that can either help or hurt the patient. As physicians, our first credo is to do no harm. The above case highlights how one simple decision, to obtain a CT scan, can lead to additional testing, treatment, and risk of harm when the best course of action may have been conservative management.

---


iii Snijders D, Daniels JM, de Graaff CS, van der Werf TS, Boersma WG. Efficacy of corticosteroids in community-acquired pneumonia: a randomized double-blinded clinical trial. Am J Respir Crit Care Med. May 1 2010;181(9):975-82.