Letter from Dr. Redwood: Experience with the use of the (relatively) new, FDA-approved procalcitonin assay (PCT).

A little background on me, I am a full-time emergency physician and president of the Wisconsin Chapter of the American College of Emergency Physicians. I also do contract work with the Wisconsin Hospital Association's quality division as an improvement advisor. I own no medical stock and have no financial disclosures.

I am a vocal proponent of using PCT in the ED and on the floor/ICU. PCT is a biomarker that exhibits greater specificity than other proinflammatory markers (eg, cytokines) in identifying patients with sepsis and can be used in the diagnosis of bacterial infections. It costs ~$15 to run in our lab and comes back in about 45 minutes (quicker than our troponin assay).

PCT's primary use in the ED is (1) **to distinguish bacterial infections from viral infections** (FDA approved). The classic example would be a COPD'er who presents with moderate exacerbation and turns the corner with steroids and albuterol. By GOLD criteria (which many argue is outdated), you would treat the patient with a respiratory fluoroquinolone even if they had no infiltrate, fever, etc. In my practice, a PCT < 0.5 ng/mL, liberates me from the blunt-instrument GOLD criteria and I treat the patient without antibiotics. I have saved 50+ patients from the risk/cost of unnecessary antibiotics with this strategy and have yet to have a patient bounce back with a bacterial infection (I follow-up on each one).

A secondary use in the ED/Floor/ICU is (2) **to predict which patient are high risk for progression to septic shock**. A PCT of 0.5 ng/mL-2.0 ng/mL corresponds to a moderate risk for progression to septic shock. A PCT of 2.0 ng/mL-10.0 ng/mL corresponds to a high risk for progression to septic shock. A PCT of >10.0 ng/mL corresponds to 99.5% likelihood of progression to septic shock. I have now had three patients that I was planning to discharge, but changed my management when the PCT came back in the 0.5 ng/mL-2.0 ng/mL range. All three were elderly and all three developed sepsis as inpatients.

The final use for PCT is more of an ICU indication. PCT can be used (3) **to gauge whether or not a septic shock resuscitation is trending towards improvement or worsening shock**. The parameters are identical to those listed above in indication (2). Higher PCT values mean that your resuscitation is failing. I have not personally used serial PCTs for this purpose, but have heard positive reviews from my intensivist colleagues.

In short, PCT is a cheap test that augments my clinical gestalt for antimicrobial stewardship decisions and risk stratification for sepsis. It has saved my butt multiple times and has not exposed me to any unwanted medical-legal risk. I highly recommend you give it a try in your ED. Keep me posted if you have any questions or thoughts to share. Literature citations are pasted below my signature line.

All the best,
Bobby

Administration USF and D. FDA clears test to help manage antibiotic treatment for lower respiratory tract infections and sepsis. http://www.prnewswire.com/news-releases/fda-clears-test-to-help-manage-antibiotic-treatment-for-lower-respiratory-tract-infections-and-sepsis-300412949.html. Accessed March 9, 2017.

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