

DIAGNOSTIC TEST II

BNP for CHF

Objectives:

1. To enhance skills in assessing studies of diagnostic test performance for validity.
2. To learn to apply the results of a study of diagnostic test performance to clinical decision making:
 - Calculating a series of likelihood ratios directly from the data in a paper
 - Considering the importance of treatment thresholds in interpreting the results of a diagnostic test
3. To gain experience in utilizing likelihood ratios in relationship to treatment thresholds to decide whether a test will help you treat, understand or advise your patient.
4. To understand the role of theoretical models in assessing the impact of a diagnostic test on post-test probability.
5. To appreciate the overlap between diagnostic and therapeutic trials when clinical research assesses the impact of diagnostic test awareness on real-time decision-making in randomized trials.

Assignment:

1. Read the attached scenario.
2. Read the attached guidelines for reading articles concerning diagnostic tests.
3. Critically appraise the attached article using the accompanying worksheet.

Clinical Scenario:

Dyspnea and geriatrics. Two of your favorite clinical topics. On this cold November night with flu season's early arrival, these two issues seem to be the preordained topic of the night. Your last five patients have all had some combination of the intertwined complaints so you fully expect your next case to be the same. You won't be disappointed.

The pleasant 85-year old doesn't look his age so you decide to "card" him. Smiling, he shows you his driver's license as he begins to describe his ailment. For the last 2-days he has noted progressively increased dyspnea associated with a non-productive cough. He has no fever or viral symptoms and notes no orthopnea or edema. In addition to a 20-year history of systolic hypertension, he notes a myocardial infarction "about 25-years ago". He appears comfortable with the following vital signs (160/90, 64, 14, 36.8, 95% on room air) without any rales, rhonchi, wheezing, gallop, murmur, or edema, but from [JAMA's Rational Clinical Exam](#) series you are aware that diagnostic findings to distinguish CHF can be unreliable. His ECG shows non-specific T-wave flattening in the high-lateral leads (aVL, V6), unchanged compared with a four year-old tracing you find in his medical record. While the chest x-ray is pending you contemplate your order set. Recalling that two clowns ([Bozo](#) and [Cletus](#)) had debated BNP-testing to exclude CHF in one of the throw-away journals last year, you decide to quickly evaluate the BNP diagnostic literature yourself.

Citations

1. Guyatt G, Rennie D, Meade MO, Cook DJ Editors, *The Users' Guides to the Medical Literature, A Manual for Evidence-Based Clinical Practice*. 3rd Edition. McGraw-Hill 2015, Chapter 18.
2. Silvers SM, Howell JM, Kosowsky JM, et al. Clinical Policy: Critical issues in the evaluation and management of adult patients presenting to the emergency department with acute heart failure syndromes *Ann Emerg Med* 2007; 49: 627-669.
3. Steinhart B, Thorpe KE, Bayoumi AM, et al; Improving the diagnosis of acute heart failure using a validated prediction model, *J Am Coll Cardiol* 2009; 54: 1515-1521.
4. Rutten JHW, Steyerberg EW, Boomsma F, et al; N-terminal pro-brain natriuretic peptide testing in the emergency department: beneficial effects on hospitalization, costs, and outcome, *Am Heart J* 2008; 156: 71-77.
5. Schneider HG, Lam L, Lokuge A, et al; B-type natriuretic peptide testing, clinical outcomes, and health services use in emergency department patients with dyspnea, *Ann Intern Med* 2009; 150: 365-371.
6. Brown MD, Reeves MJ; Interval likelihood ratios: another advantage for the evidence-based diagnostician, *Ann Emerg Med* 2003; 42: 292-297.
7. Phelps MA, Levitt MA; Pretest probability estimates: A pitfall to the clinical utility of evidence-based medicine? *Acad Emerg Med* 2004; 11: 692-694.
8. Lord SJ, Irwig L, Simes RJ; When is measuring sensitivity and specificity sufficient to evaluate a diagnostic test, and when do we need randomized trials? *Ann Intern Med* 2006; 144: 850-855.
9. Worksheet for the evaluation of an article on diagnosis test performance.