

## **DIAGNOSTIC TEST UNIT**

### **Goal:**

By the end of this module, the participant will be able to critically appraise an article about a diagnostic test.

### **Objectives:**

By the end of this module, the participant will be able to:

1. assess the internal validity of an article about a diagnostic test
2. calculate and interpret likelihood ratios (LR)
3. determine the applicability of a diagnostic test to patient care.

### **Assignments:**

1. read the clinical scenario
2. compose a well-built clinical question about the clinical problem
3. complete a literature search using the headings from your clinical question and bring the results of your search to the session
4. read the Users' Guides to the Medical Literature reference articles (see below)
5. complete the Users' Guides to the Medical Literature worksheet
6. determine the applicability of this diagnostic test to the care of the patient in the clinical scenario

### **Clinical Scenario:**

It is winter. You are the internist on-call at your hospital and have just admitted a 67-year old male who presented to the emergency department with a 3 day history of worsening shortness of breath and fatigue. There is associated worsening of a chronic, non-productive cough. Although his wife reports that he felt warm to the touch, they did not take his temperature at home.

Physical examination reveals an obese male. Blood pressure 110/75. Heart rate 100 bpm. Respiratory rate 24 breaths/min. Temperature 38.0 degrees Celsius.

On respiratory exam, there are crackles at both bases, worse on the right.

On cardiovascular exam, his heart sounds are normal and there is bilateral leg edema up to the knees which is largely non-pitting. Neither you nor the senior resident working with you can clearly see his JVP.

His initial investigations reveal a mildly elevated white blood cell count of  $13 \times 10^9 / L$  and acute on chronic renal failure with an increased creatinine of  $185 \mu\text{mol/L}$ . His chest X-ray shows bilateral mixed airspace/interstitial disease and possibly—with the eye of faith—some Kerley B lines (septal lines).

You start him on antibiotics for a presumptive diagnosis of community acquired pneumonia. But you and the resident disagree about whether or not your patient has a degree of decompensated heart failure. You want to give a dose of intravenous diuretics. The resident wants to give intravenous fluids.

The resident suggests that an assessment of the inferior vena cava using point-of-care (hand-held bedside) ultrasound might help to settle the matter. She tells you that she has completed a point-of-care ultrasound workshop, had over 25 image acquisitions supervised in clinical practice by an expert sonographer, and leaves to go find the new ultrasound machine recently purchased by your hospital's Emergency Department. While she is gone, you wonder about the accuracy of point of care ultrasound for the assessment of right atrial pressure. A quick literature search using the search terms "ultrasonography", "point of care", "inferior vena cava", "right atrial pressure" turns up 4 citations, including the following article:

Brennan JM, Blair JE, Goonewardena S, et al. A comparison by medicine residents of physical examination versus hand-carried ultrasound for estimation of right atrial pressure. *Am J Cardiol* 2007;99:1614-1616.

**Enclosed Materials:**

1. Brennan JM, Blair JE, Goonewardena S, et al. A comparison by medicine residents of physical examination versus hand-carried ultrasound for estimation of right atrial pressure. *Am J Cardiol* 2007;99:1614-1616.
2. Guyatt G, Drummond R. *Users' Guides to the Medical Literature: A Manual for Evidence Based Clinical Practice*, 3<sup>rd</sup> Edition (JAMA). New York: McGraw Hill, 2015. 18. Diagnostic Tests.
3. Critical appraisal form for diagnostic tests.