# Diagnostic Test Unit

## Objectives

At the completion of this unit you will be able to determine whether clinical data (symptoms, signs, or test results) are likely to be accurate and useful in your own clinical practice.

## Instructional Objectives

At the completion of this session you will be able;

1. To assess the validity of an article about a diagnostic test
2. To calculate a Likelihood ratio (LR)
3. To interpret a Likelihood Ratio (LR) in relation to a specific diagnostic test
4. To determine the applicability of a diagnostic test to a particular situation
5. To interpret the Likelihood ratios associated with a multilevel test.

## Reference (Further Reading)

Guyatt G, Drummond R. (eds.) User's Guides to the Medical Literature: A Manual for Evidence Based Clinical Practice.3rd Edition JAMA 2015.

## Diagnosis

1. The process of Diagnosis (Chapter 16 page 329-335)
2. Differential Diagnosis (chapter 17 page 337-341)
3. Diagnostic Tests (Chapter 18 page 345-357)
4. Advanced Topics in Diagnosis (Chapters 19.1, 19.2, 19.3)
   a. 19.1 Spectrum Bias
   b. 19.2 Examples of Likelihood Ratios
   c. 19.3 Measuring Agreement Beyond Chance

## Problem Based Educational Strategy

1. Read the Clinical Scenario.
2. Compose a well-built clinical (PICO) question about the clinical problem.
3. Complete a literature search using the headings from your well-built clinical question.
4. Read the User's Guides to the Medical Literature reference articles (Chapter 18).
5. Complete the attached User's Guides to the Medical Literature Worksheet.
6. Determine whether you should change your approach to the problem.

## Scenario

You are a pediatric resident currently completing a rotation in the Emergency Department. You see Mathew who is a 35 days old boy with rectal temperature of 39 Celsius and a runny nose. He looks tired but continues to feed ok. He is tachycardic and mildly tachypneic. Baby's uncle had a cold and he visited 3 days ago. His CBC shows WBC 12,000, ANC 6,000 and I:T ratio 7%. His electrolytes are normal. His urine analysis is negative for UTI. His CXR is normal.

You are suspecting viral URTI but cannot rule out invasive bacterial infection.
You send NPS swab for URTI viruses and CRP.
You decide to treat fever with Acetaminophen and observe baby for few hours while waiting for tests results.
After 4 hours, Mathew's temperature improved to 37.5 C. His tachypnea subsided and his HR normalized. He had a good feed. His NPS swab is negative. His CRP is 10.
Now that Mathew is doing better; Mom would like to go home. You are still concerned about his high temperature and his mildly elevated CRP. You are considering admitting him and proceeding with blood culture and antibiotics.
You decide to order Procalcitonin that was recently introduced to your institute. The attending challenges your decision asking you how that would change your management? Assuming the Procalcitonin level is 0.2 versus 3 would that make a difference in your management?

You decide to check the published evidence. You frame an appropriate PICO question, go to PubMed 'clinical queries', and put in your search terms: Infant AND fever AND calcitonin

After critical appraisal, Would Procalcitonin results of 0.2 ng/ml versus 3 ng/ml change Mathew's management?

## Enclosed Reading Materials

- Citation: Milcent K., Faesch S., le Gras-Le Guen C., Dubos F., Poulalhon C., Badier I., Marc E., Laguille C., Loc de Pontual, Mosca A., Nissack G., Biscardi S., Le Hors H., Louillet F., Dumitrescu A., Babe P., Vauloup-Fellous C., Bouyer J., Gajdos V. Use of Procalcitonin Assays to Predict Serious BacterialInfection in Young Febrile Infants. JAMA Pediatr. 2016;170(1):62-69; DOI:10.1001/jamapediatrics.2015.3210