

CLINICAL PREDICTION RULES

Objectives:

To learn how to critically appraise the validity and results of a paper on clinical prediction rules and how to apply the results in your clinical practice.

Assignment:

1. Read the clinical scenario given below and formulate your clinical question.
2. Read the article to determine if this is likely to provide the answer to your question and critically appraise the paper using the attached critical review form
3. Determine whether you can apply the results of the paper in your practice

Clinical Scenario:

You are a second year internal medicine resident working in the Emergency Department (ED) and you are asked by your attending to evaluate a patient who might have Tuberculosis (TB). There is only one isolation room in the ED which is currently occupied by a patient who has a history of MRSA and is being admitted. Your patient is sitting on a stretcher with a mask on in the far corner of the ER.

You place a mask on and proceed to take a history and perform a physical exam of the patient. She is a 45 year old Hispanic women with no significant past medical history. She is from El Salvador but moved to Canada over ten years ago. She works as a cleaning lady in a large office building in downtown Hamilton. She has been experiencing fever and cough for the past two weeks. In the last two days she developed shortness of breath and was unable to go to work. This prompted her family to take her to the ER. Her cough is productive and frequent keeping her up at night. She is a non smoker and has no recent TB contacts. She is unsure of her PPD status but believes she tested negative two years for a job physical. She has no risk factors for HIV but has never been tested.

Her physical exam is significant for stable vital signs and no fever. Her heart exam is normal and her lung exam is significant for ronchi at the right lower base. Her blood work was normal except for a slight increase in her WBC count which was 14,000 with 80% neutrophils. Her CXR shows a RLL infiltrate.

After finishing your history and physical you feel that the chance of this patient having TB is extremely low and that she most likely has community acquired pneumonia. Your attending agrees with you but insists on keeping the patient on isolation because of the small chance it could be TB and more importantly that the staff insists on three negative sputum samples for AFB in order to remove someone from isolation.

You call the admitting resident who informs you that there are no isolation beds on the floors and that the patient will have to remain in the ED and wait until an isolation bed opens up. This could be up to 24 hrs. This is the third time in just one month that you have a patient who was placed on isolation and remained waiting in the ED for over 24hrs until a room could open up. After completing your shift you go home that night determined to find out if there is anyway to predict which patients truly need isolation for suspected TB. Is there any clinical information that might help make a more accurate decision regarding who needs to be placed on isolation or not? Perhaps a clinical prediction rule is available similar to the Ottawa Ankle Rule which is frequently used in emergency departments to determine the need for ankle x-rays in ankle trauma.

You go to Med-line and search under prediction rule and TB. The search gives you five results the first of which appears to give you your answer.

Wisnivesky JP, Henschke C, Balentine J, Willner C, Deloire AM, McGinn TG. "Prospective validation of a prediction model for isolating inpatients with suspected pulmonary tuberculosis." Arch Intern Med. 2005 Feb 28;165(4):453-7.

You decide to review the article and present at the next journal club to see if the clinical prediction might be adopted by the ED.

Enclosed Materials:

1. Wisnivesky JP, Henschke C, Balentine J, Willner C, Deloire AM, McGinn TG. "Prospective validation of a prediction model for isolating inpatients with suspected pulmonary tuberculosis." Arch Intern Med. 2005 Feb 28;165(4):453-7.
2. Critical Review form for clinical prediction rules
3. McGinn T, Wyer P, McCullagh L, Wisnivesky J, Devereaux PJ, Stiell I, Richardson WAS, Agoritsas T, Guyatt G. Chapter 19.4 Advanced Topics in Diagnosis: Clinical Prediction Rules. In Guyatt GH, Rennie D, Meade MO, Cook DJ, Editors. Users' Guides to the Medical Literature: A Manual for Evidence-Based Clinical Practice 3rd Ed. New York, NY: McGraw-Hill; 2015.

Please note related articles:

Previous Derivation

Wisnivesky JP, Kaplan J, Henschke C, McGinn TG, Crystal RG. Evaluation of clinical parameters to predict Mycobacterium tuberculosis in inpatients. Arch Intern Med. 2000 Sep 11;160(16):2471-6.

Recent Meta-analysis

Wisnivesky JP, Serebrisky D, Moore C, Sacks HS, Iannuzzi MC, McGinn T. Validity of clinical prediction rules for isolating inpatients with suspected tuberculosis. A systematic review. J Gen Intern Med. 2005 Oct;20(10):947-52.