

Please answer the following essay questions:

1. Case 1: Pharyngitis:

A 32 year-old male with 3 days of symptoms, fever to 101, chills, sore throat, tender lymph nodes and a cough. Diagnosis of pharyngitis is clear.

- **Are antibiotics in order? See article on strep throat and the MedCalc3000 Mclsaac rule and advise on the next steps applying the concepts illustrated in class.**

Pharyngitis is a common symptom seen by clinicians. It accounts for 1 to 2 percent of all visits to primary care physicians. Of those visits, most are caused by a virus. Roughly 10 percent in acute pharyngitis in adults is bacterial and can be benefited by antimicrobial therapy. Penicillin V is an effective antibiotic that is found to reduce symptoms by 1 to 2 days. (Humar, Revaz, Bovier, Stralder, 2006)

Although antibiotic therapy should be prescribed in only the few patients with group A streptococcal pharyngitis (GASP), physicians prescribe antibiotics for 73 percent of patients. (Humar et al) To prevent over use or inappropriate use of antibiotics is important. Adverse effects of widespread antibiotics can result in allergy, diarrhea, increase use of medical services and costs and bacterial resistance. (Humar et al)

Using the MedCalc3000 Mclsaac rule, the questions asked related to the following along with the associated answers.

- Temperature > 38 degrees °C or 100.4 °F → 101 so Yes (1 Point)
- Cough → Symptoms indicated a cough so Yes (0 Points)
- Tender anterior cervical nodes → Yes (1 point) *which I based on the symptoms of a sore throat*
- Tonsillar swelling or exudates → No (0 points) *They symptoms given never indicated specifically if is puss or exudates existed and also made no mention if the tonsils were swollen.*
- Age 15-44 (0 Points)

(MedCalc 3000 Medical Calculator)

So, given the above, a scored value of 2 was obtained. Even if tonsillar swelling or exudates existed, this would only add one point to the score value and the recommended course of treatment would remain the same. The percentage likelihood would only change. With a scored value of 2, a 10-12% chance of strep exists. The need for antibiotics then cannot be determined without first performing a culture test. Given the results were positive, antibiotics would be prescribed. If not, then none would be prescribed. Below is a screenshot taken from the MedCalc 3000 results.

0 points	: 2-3% chance of strep; no culture or antibiotics
1 points	: 4-6% chance of strep; no culture or antibiotics
2 points	: 10-12% chance of strep; culture and treat if positive
3 points	: 27-28% chance of strep; culture and treat if positive
4-5 points	: 38-63% chance of strep; culture and treat with antibiotic on clinical grounds

Figure 1 (MedCalc 3000 Medical Calculator from Galter Health Sciences Library)

Pursuant with the article's suggestion the next step would be to perform a RSAT test along with the regular culture suggested by MedCalc3000. In doing so the patient, would have immediate feedback. Still going with the recommendation from the first question, antibiotics would be prescribed given a positive RSAT result. Another benefit too would be that the patient could be on antibiotics quicker and therefore reduce the symptoms faster where streptococcal pharyngitis was found to exist.

- **Then, please comment on how this entire process might be facilitated by healthcare IT.**

Tools such as the one used in the above exercise is already a step in the right direction. These tools are based upon evidence based medicine (EBM) principles and seek to standardized pre-test probability diagnosis through the use of clinical prediction rules (CPR). (McGinn, 2002)

Healthcare IT could help improve the use of tools like this through direct integration with an electronic healthcare record

(EHR) system. One way would be to accept the inputs similar to the web tool offered through MedCalc 3000 into a screen within the EHR. The point calculation would be tallied as answers are received and given the percentage likelihood of disease the recommended tests and treatment could be prompted to the clinician at the time of the physical exam. All could be captured on record on the patient record and available in the patient's problem list for later reference.

2. Case 2:

A 66 year-old female presents 1 day following a trip home from Europe with sudden onset of shortness of breath and chest pain that is worse when she takes a deep breath. Her heart rate is 96. She has no history of cancer. Her left leg is slightly swollen.

- **Use the article referenced for this session to estimate the patient's clinical probability of having pulmonary embolism.**

Using the revised Geneva Score table from the article, the pre-test probability score would be determined after determining the answers to the below questions.

- Age → Age > 65 → 66 so Yes (1 Point)
- Heart Beat → >= 95 beats per minute → 96 so Yes (5 Points)
- Unilateral lower-limb pain → left leg is slightly swollen (3 point)

With summing the above, a total score of 9 is assessed. This translates to an intermediate pre-test clinical probability of Pulmonary embolism. Result matrix below taken from the article:

Clinical probability	
Low	0-3 total
Intermediate	4-10 total
High	≥11 total

Using MedCalc 3000 as done in case #1 there is a pre-test probability test without chest xray. Using the below variables, a probability of 76.49% was determined which seems to be in line too with the above intermediate assessment.

- Age 56-67 (.80)
- Female (0)
- Chest Paine (1.01)
- Unilateral leg swelling (.80)
- Acute onset of sypnea (2.0)

Sources:

- Using clinical prediction rules
- Prediction of Pulmonary Embolism in the Emergency Department: The Revised Geneva Score
- <http://medcalc3000.com/NoteRight3000/PulmonaryEmbRiskPisa.htm>

- **How might the next step of similar patients' management be facilitated by healthcare IT?**

An integrated tool within an EHR system similar to what was suggested for Case 1 be helpful. In this case the problem list would be invaluable. As followed in the article, there are a number of tests recommended to rule on the probability of having a pulmonary embolism (PE). The problem list and test results would help facilitate a proper diagnosis and serve as a critical history in tracking what has been done. It could be the case that not all tests are performed at once. As the patient in question presents with symptoms, the problem list might adapt over time and lead to a test for PE and progress naturally to the other tests mentioned in this article. A EHR would help facilitate the progress of tests which would help clinicians base their assessments on clinical variables instead of implicit judgment.

References

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