



EDUCATA

Your Online Continuing Education Resource

Differential Diagnosis Foundational Clinical Decision Making

Chad Cook PT, M.B.A, Ph.D., OCS, FAAOMPT

Note to Participants: There are interactive pop-up questions throughout this lecture. If you choose to pause the lecture and return at a later time, a natural break time would be after answering the interactive questions. (You are able to pause at any time and the presentation will "remember" where you were. It's just a more natural time to pause after the interactive questions.) For your convenience, this outline reflects where/when within the lecture the interactive questions occur.

This lecture has 98 slides and is 83 minutes in duration.

- I. What is differential diagnosis?
 - A. Differentiation
 - B. Confirmation
 - C. Required elements
 - 1. Defined disease
 - 2. Gold standard
 - 3. Multidisciplinary agreement
 - 4. Meaningful information
 - D. Disease or syndrome
- II. How do clinicians make decisions?
 - A. Clinical gestalt
 - 1. Similarity
 - 2. Proximity
 - 3. Continuation
 - 4. Symmetry
 - 5. Periodicity
 - B. Deductive reasoning
 - C. Pattern recognition
 - D. Heurism
- III. Errors in decision making
 - A. Internal biases
 - 1. Representative heuristic
 - 2. The availability heuristic
 - 3. Confirmatory bias
 - 4. Illusory correlation
 - 5. Overconfidence

Interactive Questions – slide 32 @ 24 minutes

- B. Erroneous tools
 - 1. Most tests are not reliable
 - 2. Findings are sub threshold
 - 3. Fail to capture what you target

Notes

IV. The language of clinical decision making (diagnostic accuracy)

Notes

- A. Reliability
 - 1. Procedure or test
 - 2. Clinician
 - 3. Patient
- B. Sensitivity
 - 1. Rules out a disorder
 - 2. Measured from 0 to 100
 - 3. Example
- C. Specificity
 - 1. Rules in a disorder
 - 2. Measured from 1 to 100
 - 3. Example

Interactive Questions – slide 54 @ 40 minutes

- D. Positive Predictive Value
 - 1. Accounts for false positives
 - 2. $PPV = TP / (TP + FP)$
- E. Negative Predictive Value
 - 1. Accounts for false negatives
 - 2. $NPV = d / (c + d)$
- F. Positive Likelihood Ratio
 - 1. Accounts for the test and the population tested
 - 2. Values higher than ≥ 1 suggest greater strength
 - 3. < 1 limited
- G. Negative Likelihood Ratio
 - 1. The lower the value, the better
- H. Measuring design bias
 - 1. QUADAS
 - 2. 14 items
 - 3. Example
- I. SnNouts and ScPins
 - 1. Wide confidence intervals
 - 2. Use caution
 - 3. Examples

Interactive Questions – slide 78 @ 65 minutes

- V. Altering pre- and post-test probability
 - A. Nomograms
 - B. Examples
- VI. Altering the order of an examination
 - A. Early in the exam – try to rule out
 - B. Later in the exam – try to rule in
 - C. Example

Interactive Questions – slide 94 @ 79 minutes

VII. Summary

Bibliography

1. Berner ES, Graber ML. Overconfidence as a cause of diagnostic error in medicine. *Am J Med.* 2008;121:2-23.
2. Bossuyt P, Reitsma J, Bruns D, et al. Towards complete and accurate reporting of studies of diagnostic accuracy: the STARD initiative. *Family Practice.* 2004;21:4-10.
3. Cohen et al. Lumbar discography: A comprehensive review. *Reg Anesth Pain Med.* 2005;30:163-183.
4. Cook C. *Orthopedic Manual Therapy: An Evidence-Based Approach.* Upper Saddle River, NJ: Prentice Hall; 2007.
5. Cook C. Physical examination tests for neurological screening. In Cook C, Hegedus E. *Physical Examination Tests: An Evidence-Based Approach.* Upper Saddle River, NJ: Prentice Hall; 2007.
6. Cook C, Cleland J, Huijbregts P. Creation and critique of studies of diagnostic accuracy: use of the STARD and QUADAS methodological quality assessment tools. *JMMT.* 2007;15:93-102.
7. Croskerry P, Norman G. Overconfidence in clinical decision making. *Am J Med.* 2008;121:24-29.
8. Federspil G, Vettor R. Rational error in internal medicine. *Intern Emerg Med.* 2008;3:25-31.
9. Fleiss JL. *Statistical Methods for Rates and Proportions.* 2nd ed. New York: John Wiley, 1981.
10. Garbuz DS, Masri BA, Esdaile J, Duncan CP. Classification systems in orthopaedics. *J Am Acad Orthop Surg.* 2002; 10:290-297.
11. Glas AS, Lijmer JG, Prins MH, Bossel GJ, Bossuyt PM. The diagnostic odds ratio: a single indicator of test performance. *J Clin Epidemiol.* 2003;56(11):1129-1135.
12. Jaeschke R, Meade M, Guyatt G, Keenan SP, Cook DJ. How to use diagnostic test articles in the intensive care unit: diagnosing weanability using f/vt. *Crit Care Med.* 1997;25:1514-1521.
13. Jarvik JG, Deyo R. Diagnostic evaluation of low back pain. *Ann Intern Med.* 2002;137: 586-597.
14. Kabrhel C, Camargo CA, Goldhaber SZ. Clinical gestalt and the diagnosis of pulmonary embolism: does experience matter? *Chest* 2008;127:1627-1630.
15. Kempainen RR, Migeon MB, Wold FM. Understanding our mistakes: a primer on errors in clinical reasoning. *Med Teaching.* 2003;25:177-181.
16. Kim SH, Park JS, Jeong WK, Shin SK. The Kim test: a novel test for posteroinferior labral lesion of the shoulder: a comparison to the jerk test. *Am J Sports Med.* 2005;33:1188-92.
17. Klein J. Five pitfalls in decisions about diagnosis and prescribing. *BMJ.* 2005;330:781-783.
18. Laslett M, Aprill CN, McDonald B, Young SB. Diagnosis of sacroiliac joint pain: validity of individual provocation tests and composites of tests. *Man Ther.* 2005;10(3):207-18.
19. Shah RV, Everett CR, McKenzie-Brown AM, Sehgal N. Discography as a diagnostic test for spinal

pain: a systematic review. *Pain Physician*. 2005;8:187-209.

20. Thagard P. *Conceptual revolutions*. Princeton: Princeton University Press; 1992.

21. Whiting P, Rutjes AW, Reitsma JB, Bossuyt PM, Kleijnen J. The development of QUADAS: a tool for the quality assessment of studies of diagnostic accuracy included in systematic reviews. *BMC Medical Research Methodology*. 2003, 3:25.

EDUCATA