Opportunities and New Directions 2015

Written Assessment of Clinical Reasoning

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Outline

1. Clinical reasoning
2. Bloom's taxonomy
3. Written Assessment

    a) Multiple Choice Questions
    b) Script Concordance Questions
    c) Key Feature Questions

Learning Objectives

The learning objectives for this talk are:

1. Recall different assessment methods for clinical reasoning.
2. Appraise the written assessment methods for utility in your educational setting.

Clinical Reasoning

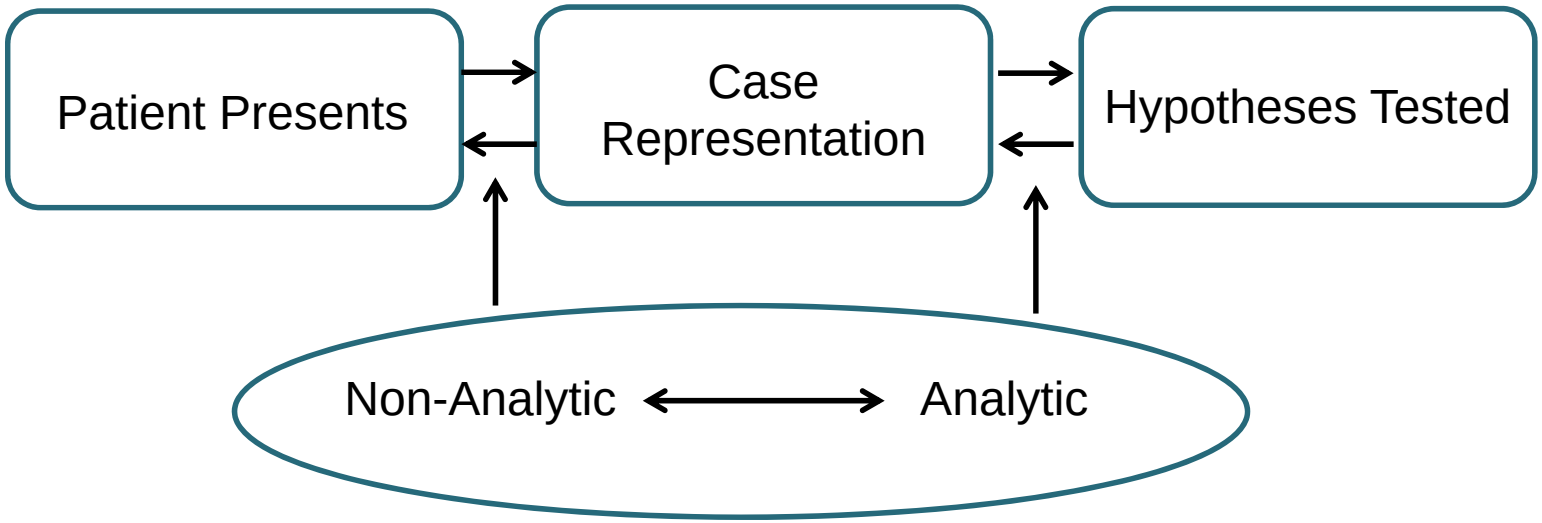
Clinical reasoning is a broad concept of the cognitive processes that occur in clinical practice in the assessment, diagnosis and management of a patient which includes but is not limited to clinical decision making.

Dual Process Theory

Cognitive Learning Theory

1. Non-Analytic Reasoning (type 1, pattern recognition)
   - Experts/Faster/Easier cases

2. Analytic Reasoning (type 2, Hypothetical Deductive reasoning/Differential Diagnosis)
   - Novices/Slower/More complex cases



Eva KW. What every teacher needs to know about clinical reasoning. Med Educ. 2005 Jan;39(1):98-106.

Development of expertise

Semantic networks

Categorical concept of the signs and symptoms

↓

Illness scripts

Mental representations of disease entities

↓

Instance scripts

Patient-centered, sign and symptom-oriented representations of disease rather than typical dictionary or textbook definitions

Schuwirth L. Is assessment of clinical reasoning still the Holy Grail? 2009 Med Ed 43; 298-299.

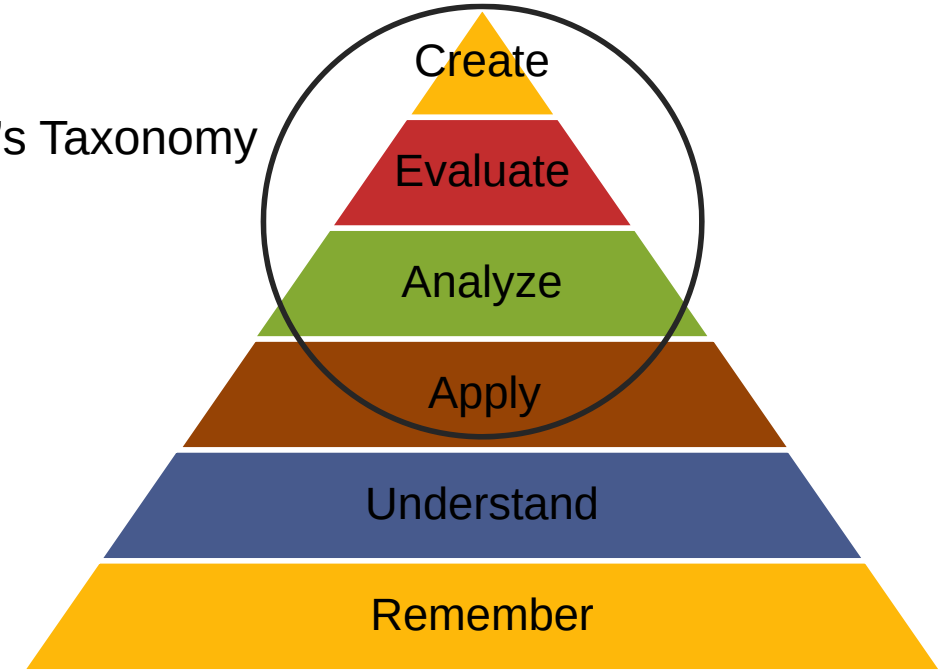
Problems with tests for clinical reasoning

1. No gold standard
2. Case specificity
3. Intermediate effect

Multiple Choice Questions

- MCQs often use cases as the stimulus and provide a short list of responses.

Modified Bloom's Taxonomy



Multiple Choice Question Format

A 44-year-old man presents with complaints of near blur. He is otherwise asymptomatic. Your DFE reveals an area inferior-nasal in the peripheral retina that is elevated with dimmed choroidal detail. It has a curved leading edge. There is no pigmented boarder. What sensory test would result in information useful in making the diagnosis?

a) Humphrey 30-2 visual field
b) Amsler Grid
c) Light perception with the BIO light
d) Humphrey 10-2 visual field

Constructing Written Test Questions For the Basic and Clinical Sciences
National Board of Medical Examiners 3750 Market Street Philadelphia, PA 19104

Pros/Cons

- Pros
  - Easy to grade
  - Able to get statistical analysis of the results
    - Percent correct, percent in top and bottom 27%, point biserial, non-distractors
- Cons
  - Time consuming to write questions
  - Easy to write at low levels of cognitive skill
  - Poor face validity (it doesn’t seem like the thing to do)

Script Concordance Test Format

- The SCT format is based upon theory in cognitive psychology and upon script theory, and aims to measure clinical data interpretation in ill-defined cases.

- The candidate assigns a change in probability of the condition based on new findings and is scored based upon aggregate scoring by experts.

Lubarsky S1, Dory V, Duggan P, Gagnon R, Charlin B. Script concordance testing: from theory to practice: AMEE guide no. 75. Med Teach. 2013;35(3):184-93.

Script Concordance Example

- A 72-year-old man presents for an urgent assessment because of a sudden onset of floaters in the right eye.

If you were thinking of:	And then you find:	This diagnosis becomes:				
Retinal detachment	He has -8 D Rx	-2	-1	0	+1	+2
Posterior vitreous detachment	Cells in the anterior vitreous	-2	-1	0	+1	+2
Vitreous hemorrhage from proliferative diabetic retinopathy	He is not diabetic	-2	-1	0	+1	+2

Lubarsky S1, Dory V, Duggan P, Gagnon R, Charlin B. Script concordance testing: from theory to practice: AMEE guide no. 75. Med Teach. 2013;35(3):184-93.

Pros/Cons

- Pros
  - Based upon script theory that the system model of clinical reasoning
  - Unique

- Cons
  - Time consuming to develop
  - Requires multiple people to develop an aggregate score
  - information presented can be seen as increasing or decreasing the likelihood of a diagnosis
  - improper methods of establishing reliability in studies
  - extreme scale anchors have been found to reflect construct-irrelevant factors

Key Feature Questions

- A key feature is defined as a significant step in the resolution of a problem thus examinations using KFQs can be considered an approach to testing rather than being defined by format.

- A case description forms the stem and is followed by 2-3 questions.

- Formats include write-in questions, short-menu questions, long-menu questions, true/false and ranking

Hrynchak P, Takahashi SG, Nayer M. Key-feature questions for assessment of clinical reasoning: a literature review. Med Educ. 2014 Sep;48(9):870-83

Key Feature Question

A 50-year-old male comes in for a routine examination with no complaints. He has been treated for lung cancer but is in remission. Presenting aided visual acuity is 20/20 distance and near. Your routine fundus examination reveals a grey round area with an indistinct boarder that is 2 DD X 2 DD in size 3 DD superior-temporal to the left optic nerve head. You decide it is a choroidal nevus.

Question 1: With respect to confirming your working diagnosis what features of this lesion would allow you to determine that it is benign? Select up to 6.

1. Acoustic hollowing on the ultrasound
2. Location anterior to the equator
3. Depth of color (light or dark)
4. Family history of melanoma
5. Flat
6. HRT characteristic of a nevus
7. Lack of orange pigment on the surface
8. Lack of visual symptoms
9. Not adjacent to the optic nerve
10. OCT characteristic of a nevus
11. Posterior to the equator
12. Presence of a lesion in the other eye
13. Presence of drusen on the surface
14. Presence of melanin bodies on the surface
15. Presence of subretinal fluid on the surface
16. Previous cancer diagnosis
17. Small size
18. Visual acuity of 20/20
19. Visual field defect
20. Younger age of the patient

Key Feature Question

Question 2

With respect to your diagnosis how would you manage this patient? If no management is required select 10. Select up to 3

1. Document the lesion by drawing it in the record
2. Document the lesion preferably with photography
3. Home monitor with an Amsler Grid
4. Monitor in 1 year
5. Monitor in 3 months
6. Monitor in 6 months
7. Refer to an ophthalmologist on a routine basis
8. Refer to an ophthalmologist on an urgent basis
9. Write a letter to the GP
10. No management is required as it is a benign lesion

Pros/Cons

- Pros
  - Validity and reliability established in educational literature
  - Used in high stakes assessment (Canadian medical board examinations)

- Cons
  - Time consuming to develop and grade
  - Student unfamiliarity

What makes a good assessment?

1. Validity or coherence: evidence test is good for a particular purpose
2. Reproducibility or consistency: same on repeat
3. Equivalence: same result in different institutions or cycles
4. Feasibility: practical, realistic, and sensible, given the circumstances and context
5. Educational effect: those assessed prepare in a way that has educational benefit
6. Catalytic effect: creates, enhances, and supports education
7. Acceptability: the assessment process and results are credible

Norcini J et al Criteria for good assessment: consensus statement and recommendations from the Ottawa 2010 Conference. Med Teach. 2011;33(3):206-14.

Thank you!