Implementation of a Novel Clinical Reasoning Curriculum for Advanced Practice Fellows in Hospital Medicine

Stacey Staudinger, MS, PA-C; David Klimpl, MD; Marina Mutter, MD; Juan Lessing, MD

CU Division of Hospital Medicine
UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

Background

- The National Academy of Medicine recommends focused improvements in diagnosis-related education as one targeted approach to improve the quality and safety of diagnosis (1).
- Most health professions training programs lack explicit, comprehensive, competency-based training in clinical reasoning and diagnosis (2).
- The majority of surveyed early-career hospitalist physician assistants indicated that a greater understanding of clinical reasoning would make them more effective in clinical practice (3).

Methods

- The Society to Improve Diagnosis in Medicine (SIDM) led a multidisciplinary Consensus Curriculum project to define the Competencies for Improving Diagnosis (4). Key individual and team-based learning objectives for our curriculum were derived through an iterative process by project faculty from this Consensus Curriculum.
- We conducted a needs assessment survey of a prior cohort of Advanced Practice Fellows which lent support for key concepts to be emphasized in our curriculum (Table 1).
- Objectives were organized into 4 teaching modules (Box 1) which were taught on dedicated education days in an interactive, case-based format.
- Learners were also provided Skills Cards to encourage deliberate practice of clinical reasoning concepts and skills in the context of clinical care (Figure 1). Learners who completed these activities could return them for a small gift card.

Box 1: Curriculum Modules

Problem Representation and Illness Scripts
Cognitive Processes and Biases
Testing and Bayesian Reasoning
Clinical Reasoning Awareness and Case Discussions

References

1) National Academies of Sciences, Engineering, and Medicine. 2015. *Improving Diagnosis in Health Care*. Washington, DC: The National Academies Press.
2) Graber M, Rencic J, Rusz D, et al. Improving diagnosis by improving education: A policy brief on education in healthcare professions. *Diagnosis*. 2018;5(3):107-118.
3) Torok H, Lackner C, Landis R, Wright S. Learning needs of physician assistants working in hospital medicine. J Hosp Med. 2012 Mar;7(3):190-194.
4) Olson A, Rencic J, Cosby K, et al. Competencies for improving diagnosis: An interprofessional framework for education and training in healthcare. *Diagnosis*. 2019;26;6(4):335-341.
5) Resource from Society to Improve Diagnosis in Medicine, available at: https://www.improvediagnosis.org/educatorresources/

Objective:

To design, implement, and evaluate a clinical reasoning curriculum for the University of Colorado Advanced Practice Fellowship in Hospital Medicine.

Table 1: Needs Assessment

Skills with high knowledge/confidence ratings	Skills with moderate knowledge/confidence ratings
Formulate an accurate problem representation	Recognize and mitigate detrimental cognitive biases in yourself and others
Conduct an H&P in a hypothesis-driven manner	Analyze one's own thought processes to further refine the diagnostic reasoning process
Formulate a relevant prioritized differential diagnosis	Apply the concepts of sensitivity, specificity and positive and negative predictive value
	Apply probabilistic and/or Bayesian Reasoning to organize a differential diagnosis
	Recognize the limitations of objective data in the diagnostic process including false positive and false negative tests

Figure 1: Sample Skills Card

Correctly uses the SLOW bias mitigation technique to attempt to prevent the effect of a cognitive bias.

The "SLOW" mnemonic below is a cognitive forcing tool to assist with bias mitigation. The fellow must verbalize at least one of the prompts when discussing their diagnostic process in the setting of a potential bias to receive credit. They do not need to cite the potential bias by name.

S:	Sure about that? Why?
L:	Look at the data, what is Lacking, does it all Link together?
O:	Opposite – What if the Opposite is true?
W:	Worst case scenario, What else could this be?

Ex (L is used, as well as the potential for bias due to anchoring): "This patient's first problem is syncope. I was told by the ED the patient had syncope due to dehydration. However, what's Lacking to reinforce that diagnosis is a prerenal AKI, tachycardia, or hemoconcentration. I will expand my differential past dehydration for this reason."

Box 2: Future Directions for Multimodal Assessment

➢ Paired pre-post surveys of learners' knowledge and confidence
➢ Participation with skills cards
➢ 3-month follow-up survey
➢ Addition of knowledge assessment to surveys
➢ Scoring H&Ps with a structured rubric for clinical reasoning
➢ Direct observation with the Assessment of Reasoning Tool (5)
➢ OSCE

Outcomes

- The curriculum has been delivered to our first cohort of learners (6 fellows) who rated the sessions highly (Table 2).
- Given small learner cohorts, we will need to pool several cohorts to perform further statistical analysis. Further multi-modal assessment will be added in future iterations (Box 2).

Table 2: Learner Ratings

Learner Composite Session Ratings Response Rate 83% (20/24) Ratings on a 7-point Likert Scale; 7 = Strongly Agree	
What I learned in this session **will be useful for my future practice.**	6.35
Overall, I am **satisfied** with this educational session.	6.4
Learner Overall Curriculum Ratings Response Rate 66% (4/6) Ratings on a 7-point Likert Scale; 7 = Strongly Agree	
Participating in this educational series increased my **knowledge** of clinical reasoning.	6.5
Participating in this educational series increased my **comfort level** with clinical reasoning.	6.25
Participating in this educational series **will improve my care of patients**.	6.5

Discussion

- This curriculum is an early, but successful example of application of the Society to Improve Diagnosis in Medicine's Consensus Curriculum to a particular learner group. As conceptualized by the "Improving Diagnosis in Healthcare" report and Consensus Curriculum authors, diagnostic reasoning learning should occur across the continuum from student to professional practice and has multidisciplinary applications.
- Assessment of the impact of clinical reasoning education at an individual level remains difficult as the reflective practice and habits it ideally generates exist within the mind of the clinician. Similarly, assessing the impact of education at a program or system level is also challenging since, at its best, it is designed to prevent error.
- Further research is needed to determine educational best practices and meaningful tools for assessing clinical reasoning development and entrustable professional activities.