

Diagnosing Diagnosis

Robert L. Wears, MD, PhD*

*Corresponding Author. E-mail: wears@ufl.edu or r.wears@imperial.ac.uk, Twitter: [@wears_r](https://twitter.com/wears_r)

0196-0644/\$-see front matter

Copyright © 2014 by the American College of Emergency Physicians.

<http://dx.doi.org/10.1016/j.annemergmed.2014.08.009>

A **podcast** for this article is available at www.annemergmed.com.

SEE RELATED ARTICLE, P. 575.

[Ann Emerg Med. 2014;64:586-587.]

Problems in diagnosis have gained increasing attention in discussions about the safety of care.¹ This attention is long overdue, but much like the general body of research on patient safety, its quality has been disappointing. It has been heavily dominated by physicians with little input from the cognitive sciences,² focusing mostly on potential interventions—checklists, mnemonics, ground rules, computerized decision support, or exhortations (essentially amounting to “be more Protestant”)—aimed at overcoming the defects believed to exist in current practices.³⁻⁸ What is missing, however, is foundational work aimed at understanding how clinicians in actual situations take a complex, tangled stream of phenomena and select some to create an understanding of them as a “problem.”

It may not seem obvious to us as practitioners, but clinical problems seldom present themselves as givens, fully formed, like pebbles lying on a beach.⁹ To construct a problem from a jumbled collection of circumstances, practitioners must make sense of an uncertain and disorganized set of conditions that initially make little sense¹⁰; they must turn *circumstances* into *situations*, “combinations of circumstances at a given moment in a particular context that are imbued with meaning and can serve as the foundation for actions and expectations.”¹¹ Because cognitive activity consists of much more than consciously experienced thought, the foundational work needed to illuminate this sense-making capability is difficult; to a great extent, these processes are not directly accessible either to subjects or observers.

In this issue of *Annals*, Pelaccia et al¹² take a unique approach to this much-needed foundational work. They build on a half-century-long tradition of Francophone work ecology research¹³ that has emphasized detailed phenomenological descriptions of work practices in naturalistic settings, and supplemented traditional cognitive incident interviews¹⁴ by cueing from video recordings taken by head-mounted cameras to help physicians relive (rather than simply recount) the developing diagnostic framings during their patient encounters.

They report that most diagnostic hypotheses were generated in the first 5 minutes of the encounter, often before the patient was met. This suggests that sense-making begins not with conscious reasoning, but instead involves extensive, preconscious processing whose results

are presented to the conscious mind for a bit of tweaking and a final blessing. Their work provides insight into the processes of clinical reasoning, using the term *reasoning* in a much broader sense than its typical connotation of denoting mental work of which we are aware—the clinicians in this study are “reasoning” their way toward an understanding in the same sense that we “reason” our way to work each morning; they are calling on preconscious mental resources over whose operations they hold little direct sway.

Their work also highlights some aspects of clinical expertise. The expert clinicians in this study arrived at diagnostic framings rapidly and effortlessly, with a facility that “belies the difficulty of the demands resolved and dilemmas balanced.”¹⁵ In addition, they held their final framings lightly, remaining aware of alternative framings until further investigations provided additional information.¹⁶ Both these properties differ strongly from those of novices, whose clinical reasoning tends to be slow and laborious and who are reluctant to revisit initially settled impressions.¹⁷

On reflection, the power of this “preprocessing” faculty seems astounding. The remarkable datum that needs explanation is not what lies behind the occasional “failure of rendition” in clinical reasoning,¹⁸ but rather how it could possibly work as well and as quickly as it does, given the virtually limitless problem space and the highly restricted set of levers available to practitioners.

Understanding how clinicians’ minds work in actual settings dealing with actual problems under actual constraints lies at the heart of any effort to improve the safety, quality, or efficiency of care. This report¹² adds a bit to what we know about clinical reasoning, but its real value is in highlighting how much we do not yet know. It is an example of much-needed foundational work exploring the basic science of human performance in complex, unforgiving environments. Just as in many other areas of medicine, future success here lies less in the application of what we think we know now than in the careful, deliberate working out of what we do not yet know.¹⁹

Supervising editor: David L. Schriger, MD, MPH

Author affiliations: From the Department of Emergency Medicine, University of Florida, Jacksonville, FL; and the Clinical Safety Research Unit, Imperial College London, London, England.

Funding and support: By *Annals* policy, all authors are required to disclose any and all commercial, financial, and other relationships in any way related to the subject of this article as per ICMJE conflict of interest guidelines (see www.icmje.org). The author has stated that no such relationships exist.

REFERENCES

1. Graber M. Diagnostic errors in medicine: a case of neglect. *Jt Comm J Qual Patient Saf.* 2005;31:106-113.
2. Wears RL, Perry SJ, Sutcliffe KM. The medicalization of patient safety. *J Patient Saf.* 2005;1:4-6.
3. Ely JW. "Preflight checklists" for diagnosis: a personal experience. *Diagnosis.* 2014;1:131-134.
4. Ely JW, Graber ML, Croskerry P. Checklists to reduce diagnostic errors. *Acad Med.* 2011;86:307-313.
5. Shimizu T, Matsumoto K, Tokuda Y. Effects of the use of differential diagnosis checklist and general de-biasing checklist on diagnostic performance in comparison to intuitive diagnosis. *Med Teach.* 2013;35:e1218-e1229.
6. Greenes RA. Reducing diagnostic error with computer-based clinical decision support. *Adv Health Sci Educ Theory Pract.* 2009;14(suppl 1): 83-87.
7. Graber ML. Educational strategies to reduce diagnostic error: can you teach this stuff? *Adv Health Sci Educ Theory Pract.* 2009;14(suppl 1):63-69.
8. Trowbridge RL. Twelve tips for teaching avoidance of diagnostic errors. *Med Teach.* 2008;30:496-500.
9. Weick KE. *Sensemaking in Organizations.* Thousand Oaks, CA: Sage Publications, Inc; 1995.
10. Crandall B, Wears RL. Expanding perspectives on misdiagnosis. *Am J Med.* 2008;121:S30-S33.
11. Wears RL, Nemeth CP. Replacing hindsight with insight: towards a better understanding of diagnostic failures. *Ann Emerg Med.* 2007;49:206-209.
12. Pelaccia T, Tardif J, Tribby E, et al. How and when do expert emergency physicians generate and evaluate diagnostic hypotheses? qualitative study using head-mounted video cued-recall interviews. *Ann Emerg Med.* 2014;64:575-585.
13. de Keyser V. Work analysis in French language ergonomics: origins and current research trends. *Ergonomics.* 1991;34:653-669.
14. Klein GA, Calderwood R, MacGregor D. Critical decision method for eliciting knowledge. *IEEE Trans Syst Man Cybern.* 1989;19: 462-472.
15. Nemeth CP, Cook RI, Woods DD. The messy details: insights from the study of technical work in health care. *IEEE Trans Syst Man Cybern.* 2004;34:689-692.
16. Rudolph JW, Morrison JB, Carroll JS. The dynamics of action-oriented problem solving: linking interpretation and choice. *Acad Manage Rev.* 2009;34:733-756.
17. Schubert CC, Denmark TK, Crandall B, et al. Characterizing novice-expert differences in macrocognition: an exploratory study of cognitive work in the emergency department. *Ann Emerg Med.* 2013;61:96-109.
18. Weick KE. *Making Sense of the Organization.* Malden, MA: Blackwell; 2001.
19. Cook RI. Lessons from the war on cancer: the need for basic research on safety. *J Patient Saf.* 2005;1:7-8.

eTable of Contents Alerts

Receive the latest developments in emergency medicine via the monthly eTOC.

Request delivery of *Annals of Emergency Medicine's* e-Alerts directly to your e-mail address. This is a fast, easy, and free service to all subscribers. You will receive:

- E-mail notification of each new issue of *Annals of Emergency Medicine*, including the posting of each issue on the *Annals* Web site
- Complete Table of Contents for all new issues, hyperlinked to the Web site.