

Inpatient Notes: Diagnostic Excellence Starts With an Incessant Watch

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Diagnostic errors are an important quality and safety issue in health care. In an earlier installment of *Annals for Hospitalists*, Zwaan and Singh explained how diagnostic errors arise from a combination of systems and cognitive factors (1). Systems improvements often take years to unfold, but cognitive improvement can begin today. How can motivated clinicians begin to improve their diagnostic performance?

A MENTAL TRAINING PROGRAM

Every model of performance improvement is built on the foundation of feedback. But when it comes to diagnostic performance, hospitalists scarcely get it. There is feedback on billing. There is feedback on length of stay. There is feedback on medication reconciliation rates. But there are no systems to deliver feedback on the most important metric of all: a correct diagnosis.

A diagnosis is a judgment characterized by uncertainty and probabilistic reasoning—it is seldom definitive at the initial point of care. In *Superforecasting: The Art and Science of Prediction*, Philip Tetlok highlights how ordinary people develop extraordinary judgment by extracting as much wisdom as possible from their inevitable errors. In *Peak: Secrets from the New Science of Expertise*, Anders Ericsson underscores how top performers intentionally design activities that use feedback to optimize their judgment and skills for future challenges. Examples include Benjamin Franklin constantly comparing his initially pedestrian writing to the gold standard periodical of his time, the Navy Fighter Weapons School (Top Gun) employing rigorous flight re-

views to mold elite fighter pilots, and chess grandmasters who engage in solitary practice comparing their tactical choices against published games. Both books emphasize how the best decision makers do not optimize their judgment by simply doing the same thing for a long period. Rather, they become great by designing a learning program that continuously calibrates their core mental models through feedback. Clinicians who wish to improve their diagnostic performance must do the same.

Tetlok is axiomatic on this point: If you don't get feedback, your confidence grows much faster than your accuracy. I may believe that after 19 years of evaluating patients with chest pain, with some of those patients having acute coronary syndromes but most not, I am skilled at discerning the presence or absence of coronary artery disease (CAD). But if I never track a reasonable 90-day measure of CAD (for example, imaging) or CAD-related events (for example, myocardial infarction [MI]) in the patients for whom I have guessed “yes” or “no” for CAD-related chest pain, I will hardly improve in that judgment. Contrast that “passage-of-time” approach to the system of a younger physician who tracks all of her “rule out MI” admissions for 3 years to discern which patients had an abnormal stress test or culpable coronary lesion on catheterization and which did not (including patients who did fine with no testing at all). She is destined to make more accurate predictions about CAD than I will. I may be more confident, but she will undoubtedly be more competent.

Time, technology, and psychology all create barriers to developing a mental training program that tracks

Table. Elements of a Diagnostic Tracking System

Step	Rationale	Example
Create a HIPAA-compliant paper-, device-, or EMR-based tracking system	Your system has to permit real-time capture of patient information and the relevant question.	EMR list of patients to track; phone-based app
Establish a small number of cases to track per day	It is impossible to revisit every case. Set yourself up for success by keeping the list manageable.	I will record my diagnostic impression and question for 2 patients per day.
Prioritize common, “easy” cases over rare, “interesting” ones	It is more important to improve at discriminating congestive heart failure from pneumonia than distinguishing pheochromocytoma from carcinoid syndrome. Many more patients are counting on you to get the former distinction right. Author experience: The “easy” cases are often the ones I get wrong	For 6 months I will focus on improving my ability to discriminate venous stasis from lower extremity cellulitis. (Goal: To decrease antibiotic treatment for pseudocellulitis)
Set a reminder for when the answer to the diagnostic question is expected	To maximize efficiency, aim to check the outcome once.	My phone's HIPAA-compliant app reminder is set to go off in 10 days when the <i>Bartonella</i> serology results are due.
Set up a biweekly time to “run the list”	Some patients' outcomes may require repeated checks.	Every other Friday before multidisciplinary rounds, I set aside 15 minutes to run the list.
Create a learning log by recording the outcome and lesson of each case	Every time you revisit the case log and see the lesson, you reinforce earlier learning.	“Mr. Singh—lower extremity erythema resolved without antibiotics, just elevation (note: WBC = 12, no fever).”

EMR = electronic medical record; HIPAA = Health Insurance Portability and Accountability Act; WBC = white blood cell count.

diagnostic judgments and outcomes. The **Table** shares tips to get started.

CALIBRATION

The greatest challenge that arises in tracking diagnostic outcomes is improving rather than reacting. When I learn that a patient I diagnosed with a migraine headache returned the next day to have her subarachnoid hemorrhage correctly diagnosed by my colleague, there is a substantial risk that I may overreact and start ordering more computed tomography scans on patients with headaches for the foreseeable future. There's an equal chance that I might underreact and attribute the diagnostic error to the patient's meandering history, how busy the wards were that day, or anything else other than my judgment process. Both reactions undermine the purpose of feedback: to analyze performance and reinforce what was done well while diligently searching for at least 1 thing that I could have done better.

Conversations with colleagues can help distinguish when improvement is warranted and when we might degrade our diagnostic performance by chasing random variation and stochastic events (2). When we ruminate privately without input from a coach, a colleague, or the literature, we run the risk for substituting the tough question (was this a good decision?) with the easy question (was this a good outcome?). Conversations can help maintain the focus on the former.

AN INCESSANT WATCH

There is no plateau in the amount of wisdom a clinician can acquire, but wisdom does not come from experience alone.

In 1905, William Osler admonished his students to create a patient log and to "begin early to make a

three-fold category: clear cases, doubtful cases, mistakes. And learn to play the game fair, no self-deception, no shrinking from the truth; mercy and consideration for the other man, but none for yourself, upon whom you have to keep an incessant watch. . . . It is only by getting your cases grouped in this way that you can make any real progress in your post-collegiate education; only in this way, can you gain wisdom with experience" (3, 4).

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Disclosures: Disclosures can be viewed at www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M17-2447.

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Ann Intern Med. 2017;167:HO2-HO3. doi:10.7326/M17-2447

References

1. Singh H, Zwaan L. Annals for Hospitalists Inpatient Notes: reducing diagnostic error—a new horizon of opportunities for hospital medicine. *Ann Intern Med.* 2016;165:HO2-HO4. [PMID: 27750328] doi:10.7326/M16-2042
2. Schiff GD. Minimizing diagnostic error: the importance of follow-up and feedback. *Am J Med.* 2008;121:S38-42. [PMID: 18440354] doi:10.1016/j.amjmed.2008.02.004
3. Osler W. The student life. A farewell address to Canadian and American medical students. *The Medical News.* 1905;87:625-33.
4. Smith KA. To keep an incessant watch. *Acad Emerg Med.* 2011;18:545-8. [PMID: 21569172] doi:10.1111/j.1553-2712.2011.01052.x