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Reducing Diagnostic Errors — Why Now?

Dhruv Khullar, M.D., M.P.P., **Ashish K. Jha, M.D., M.P.H.**, and **Anupam B. Jena, M.D., Ph.D.**

Department of Medicine, Massachusetts General Hospital (D.K., A.B.J.); the Division of General Internal Medicine, Brigham and Women's Hospital (A.K.J.); the Veterans Affairs Boston Healthcare System (A.K.J.); the Department of Health Policy and Management, Harvard School of Public Health (A.K.J.); and the Department of Health Care Policy, Harvard Medical School (A.B.J.) — all in Boston; and the National Bureau of Economic Research, Cambridge, MA (A.B.J.).

Diagnostic errors are thought to be a substantial source of avoidable illness and death in the United States. Although diagnosis has always been central to the practice of medicine and diagnostic errors have always been prevalent, systematic efforts to measure these errors and analyze their underpinnings have been limited, as compared with other quality- and safety-improvement efforts.[1,2] Several reasons have been suggested for this relative lack of attention, including a lack of understanding of decision-making biases, cultural attitudes discouraging discussion of misdiagnosis, the difficulty of defining and identifying such errors, assumptions about the impracticality of potential process or outcome measures of diagnostic quality, and the belief that diagnostic errors are less amenable than other types of medical errors to systems-level solutions.[2]

But we would argue that diagnostic errors are clinically and financially more costly today than ever before and that they therefore require greater attention and more dedicated resources. In the past, the health care system had less capacity — and perhaps less need — to address this problem. More limited treatment options for many conditions meant less likelihood of iatrogenic harm from inappropriate interventions and less potential for lost clinical benefit from appropriate ones. The tools available for tracking and preventing diagnostic errors, such as health information technology (HIT), were less sophisticated. And there was minimal external pressure from payers to study and tackle the issue.

As treatment options have become more effective and costly, the clinical and financial costs of misdiagnosing a readily treatable condition are substantially greater. Advances in HIT and big data offer new instruments for measuring and reducing diagnostic errors. And pay-for-performance metrics and risk-based contracts have created an economic environment in which accurate, timely diagnosis can be rewarded. In short, there is now more we can do to reduce diagnostic errors, and the clinical and financial value of doing so is greater. It thus makes sense to place greater emphasis on reducing these errors — as organizations such as the Institute of Medicine (now the National Academy of Medicine), which has just released a report on the topic (http://nas.edu/improvingdiagnosis), are beginning to do. (Drs. Jha and Jena served on the Institute of Medicine committee.)

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With health care costing more than ever before, and missed or delayed diagnoses often resulting in higher downstream costs for treating more advanced disease, the financial implications of misdiagnosis can be substantial. Consider, for example, how the cost of failing to diagnose early-stage colon cancer has changed over the past two decades. Treating stage 4 colon cancer now costs more than three times what it costs to treat stage 1 disease, owing in part to the advent of potentially effective but expensive new therapies. Before these treatments were available, the clinical costs of misdiagnosis were high, but the financial costs were less so. As costly treatments for advanced disease become increasingly available, the costs of misdiagnosis — as well as those of overdiagnosis — can be expected to rise even further.

In the absence of effective treatment, the primary value conferred by accurate diagnosis is prognostic information rather than improved health. When treatment options are limited and prognosis is bleak, a diagnostic error is unfortunate; when prompt treatment can return a patient to full health, a diagnostic error is devastating. The ability of contemporary medicine to treat many conditions for which effective treatments were previously unavailable means that diagnostic errors cost much more now in terms of lost life and quality of life.

Advances in the management of acute myocardial infarction illustrate this point. Before the introduction of coronary care units, inpatient mortality among patients with acute myocardial infarction exceeded 30%. The development of coronary care units and sequential advances in fibrinolysis, percutaneous coronary interventions, and dual antiplatelet therapy have reduced inpatient mortality to nearly 5%, and patients who survive have greater cardiac reserve and higher quality of life than those who survived in the past.[3] Thus, a failure to quickly and accurately diagnose acute myocardial infarction today has far greater implications for a patient's immediate and long-term health. Similarly, failing to accurately diagnose pulmonary embolism and stroke — two commonly misdiagnosed conditions — has greater health consequences for patients today simply because better treatments exist.

The costs of diagnostic errors can extend beyond the patients whose conditions are misdiagnosed. Certain diagnostic errors — such as failure to accurately diagnose infectious disease or identify mental illness in people with a history of violent crime — affect not just the person in whom the diagnosis was missed, but also potentially many others with whom that person comes in contact. Although pulmonary embolism and stroke are among the most commonly misdiagnosed conditions, the total number of patients affected by a misdiagnosed communicable illness such as HIV infection could be several times greater than the number with a misdiagnosed noncommunicable disease. And because the world is now more interconnected, missing the diagnosis of a virulent communicable illness has increasingly far-reaching public health implications.

Indeed, the increasing virulence and resistance of common pathogens further amplifies the risk that the misdiagnosis of a single patient will result in broad adverse effects for others. For example, in the 1970s, less than 2% of *Staphylococcus aureus* infections were methicillin-resistant; today, more than 60% are. From 2000 to 2007, the incidence of community-acquired methicillin-resistant *S. aureus* infection grew nearly sevenfold.[4] The spread of multidrug-resistant pathogens means that failure to accurately and rapidly

diagnose communicable infection today has a far greater network impact than it did in the past.

Systematically addressing diagnostic errors will require a comprehensive approach. We would recommend developing formal curricula to educate trainees about misdiagnoses. Federal agencies and private foundations could allocate more tailored funding for the study of root causes of diagnostic errors as well as for programs that might reduce the error rate. With increasing use of HIT and the development of new care delivery models, the U.S. health care system is poised to track and reduce diagnostic errors on a larger scale than it could in the past. One promising approach involves the use of “trigger tools” — electronic algorithms that identify potential adverse events by searching electronic health records and flagging specific occurrences. A recent study used triggers to identify patients with unplanned hospitalizations within 14 days after a primary care visit and found a misdiagnosis rate of 20.9%, as compared with 2.1% in the control group.[5]

An important next step will be developing validated metrics for diagnostic errors. These metrics would aim to define how frequently various errors occur; help elucidate their downstream health and economic implications; and allow identification of the provider, patient, and health system factors that are associated with — and that could be used to reduce — rates of misdiagnosis. Such data could be made available to providers and organizations to spur research and innovation in this area. Ultimately, a robust set of metrics and delineation of relevant modifiable behaviors may permit public reporting of diagnostic-error rates and linking of incentive payments to reductions in misdiagnosis, just as incentives are now linked to complication and readmission rates for certain procedures and conditions.

By failing to actively acknowledge and address the growing health and economic costs of diagnostic errors, we miss an important opportunity to provide better care for patients and realize better financial performance for health systems. And that’s an error we can’t afford.

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