

Measure Dx: Implementing pathways to discover and learn from diagnostic errors

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Abstract

Despite the high frequency of diagnostic errors, multiple barriers, including measurement, make it difficult to learn from these events. This article discusses Measure Dx, a new resource from the Agency for Healthcare Research and Quality that translates knowledge from diagnostic safety measurement research into actionable recommendations. Measure Dx guides healthcare organizations to detect, analyze, and learn from diagnostic safety events as part of a continuous learning and feedback cycle. Wider adoption of Measure Dx, along with the implementation of solutions that result, can advance new frontiers in reducing preventable diagnostic harm to patients.

Key words: diagnostic errors, delayed diagnosis, patient safety, measurement

Diagnostic errors occur at an alarming frequency; estimates from the USA suggest that 5% of adult outpatients experience a diagnostic error each year [1], and about a quarter million harmful diagnostic errors occur each year in hospital settings [2]. Despite the frequency of these events, clinicians and healthcare organizations (HCOs) seldom learn from them [3]. One reason is that diagnostic errors are difficult to identify and analyze. Strategies to systematically detect and learn from diagnostic error remain early in development and not widely implemented. In this paper, we discuss a new resource from the US Agency for Healthcare Research and Quality—Measure Dx—that synthesizes knowledge from researchers at the leading edge of diagnostic safety measurement to provide pragmatic guidance on how HCOs can identify and analyze diagnostic errors for the purposes of learning and improvement.

Measurement for improvement differs in its approaches and goals from measurement for research or accountability purposes [4]. For instance, measurement for improvement may focus on small, narrow samples of events, such as those specific to an error-prone process or frequently missed diagnosis. It is also generally more concerned with depth than breadth and is tolerant of a range of types and standards of evidence including near-misses and ‘weak signals’. [5] Measure Dx embraces this conceptualization of measurement and acknowledges that comprehensive and universal measures of diagnostic error are not currently available.

Overcoming obstacles to measurement

Measure Dx addresses several barriers to measurement of diagnostic errors. For instance, lack of consensus around an operational definition of diagnostic error has slowed improvement efforts. The resource adapts prior definitions [3, 6] to define and operationalize ‘diagnostic safety events’ and addresses methodological barriers by providing valid, pragmatic tools and guidance on how to perform diagnostic safety analysis and classify contributing factors. These tools may be applied to different types of diagnoses (e.g. cancer and cardiovascular) and settings (e.g. hospital, primary care and emergency care).

Another obstacle to measurement is uncertainty about where and how to get started. Considering which diagnoses to focus on, how to identify at-risk diagnostic processes and which factors most significantly led to missed or delayed diagnosis can all be overwhelming. As noted above, aiming for universal capture of these events is unrealistic. Rather, the goal is to overcome inertia and begin to identify diagnostic safety events by sampling possible events from data sources that are readily available. Figure 1 presents an overview of several data sources that can be used to identify events for further analysis. Although the primary goal of these activities is not an event count per se, events can be tracked quantitatively over time for improvement efforts using even a small number of discrete data sources [7].

Four Strategies to Identify Diagnostic Safety Learning & Improvement Opportunities

STRATEGY A Use Existing Quality and Safety Data

Examine previously identified safety events for diagnostic improvement opportunities



STRATEGY B Solicit Reports from Clinicians

Ask clinicians to bring attention to diagnostic events within an environment of psychological safety



STRATEGY C Leverage Patient-Reported Data

Examine patient surveys, incident reports, and complaints to identify missed opportunities



STRATEGY D Electronic health record-enhanced chart review

Use EHR searches or trigger algorithms to identify high-risk diagnoses or care patterns



Systematically review cases for learning opportunities and contributing factors

Figure 1 Four Strategies to Identify Diagnostic Safety and Learning Opportunities

Measure Dx content

Recent work at several US HCOs shows it is feasible to use systematic approaches to detect and analyze diagnostic errors and learn from these missed opportunities. Measure Dx incorporates several of these real-world cases and lessons learned, along with research on emerging measurement strategies [8], into a modular resource that can be used by healthcare entities from smaller practices to entire health systems. The resource helps create a shared understanding of the task and a plan to identify and systematically collect data from events for shared learning and discovery. We recently field-tested Measure Dx in collaboration with 12 clinician-led quality and safety improvement teams at HCOs across the US. Feedback from these teams was used to refine Measure Dx prior to its

release (available for free at: <https://www.ahrq.gov/patient-safety/settings/measure-dx.html>).

To implement Measure Dx, we recommend that HCOs form a diagnostic safety team, including at a minimum a quality and safety professional and a clinician whose scope of practice includes diagnosis. This allows a focus on both cognitive (e.g. clinical reasoning and assessment) and systems aspects of analysis. However, to ensure synergy, Measure Dx should be integrated within existing patient safety structures. We recommend that anyone using these strategies for the first time begin with a small scope of work. As diagnostic safety activities mature, teams can explore multiple data sources synchronously and may shift their event detection and analysis strategy toward those that have the greatest yield for actionable intelligence. In line with the goals of a learning health system, this effort is expected to be cyclical, or iterative, over time and should inform development of solutions. Throughout the process, psychological safety is imperative. Missed, delayed and wrong diagnoses must be framed as learning opportunities.

Toward learning health systems that aspire to improve diagnosis

Measure Dx can enable HCOs and clinicians to make progress in the complex area of diagnostic safety measurement. Many of the data sources and analytic techniques described in this resource are generalizable across various settings and countries. The resource could be useful to any HCO that has some existing infrastructure for safety and is interested in discovering improvement opportunities from the analysis of diagnostic errors. Wider adoption of Measure Dx, along with the implementation of solutions that result, can advance new frontiers in reducing preventable diagnostic harm to patients.

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Author contribution

A.B. and H.S. drafted the manuscript. M.S. revised the draft manuscript. All authors contributed substantively to the content of the manuscript and had an opportunity to review and approve the final submitted version.

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