Modest Progress on the Path to Electronic Health Record Medication Safety

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Electronic health records (EHRs) have provided clear benefits, but they have also introduced serious safety concerns that have led to harm in children and adults.[1-3] Numerous stakeholders have called for improvements to EHRs to better protect patients. However, a rigorous EHR safety certification program is nonexistent, and once this technology is implemented and used to treat patients, ongoing safety assessment is rarely conducted, making it difficult to identify safety risks and measure improvements over time.[4,5] One EHR assessment tool focused on medication safety that is used by several hospitals is the Leapfrog computerized physician order entry (CPOE) EHR simulation tool. In this study by Classen et al,[6] assessment results during a 10-year period are analyzed to determine whether hospital EHR safety performance is improving over time. Classen et al reported progress, albeit modest.

The Leapfrog CPOE EHR assessment tool provides a simulation-based method to evaluate EHR medication safety by presenting physicians with real-world test patients, asking physicians to write medication orders, and evaluating whether the CPOE EHR system provided appropriate clinical decision support (CDS) or alerts to potential adverse drug events. The simulation includes basic and advanced CDS scenarios. Classen et al[6] describe performance on the Leapfrog CPOE EHR assessment tool with a sample of 2314 hospitals using 30 different EHRs from 2009 through 2018. The number of hospitals participating in the Leapfrog CPOE EHR assessment increased 10-fold from 2009 to 2018.

The results reported by Classen et al[6] show modest improvements in hospital performance on the basic and advanced scenarios during the 10-year period. While the mean basic CDS scenario score was 85.6% across all hospitals, with some hospitals achieving a perfect score, many hospitals were found to be lagging, and the mean advanced CDS score was only 46.1%. Hospitals using the same EHR vendor had very different scores. and there was wide variability in results by EHR vendor. Vendor choice accounted for approximately 10% of performance variation. Demonstrating slow EHR safety progress that is not uniform across all hospitals, these results provide a clear indicator that safety improvement efforts should be accelerated and be a central focus of all stakeholders, including health care organizations, EHR vendors, patients, and federal agencies.

There are both near-term and long-term opportunities to advance EHR safety. In the near-term, hospitals and other health care facilities should use existing EHR safety assessment test case scenarios, in addition to completing the Leapfrog CPOE EHR simulation, to evaluate the safety of their implemented EHR product, identify hazards, and develop mitigation strategies in partnership with their EHR vendors.[5] These safety use cases should be used on a regular basis, especially after EHR system downtimes, upgrades, or other changes. The findings by Classen et al[6] that showed safety performance variability for hospitals using the same vendor suggest that there is an opportunity for EHR vendors to share best practices across their hospital clients and for hospitals to share best practices directly with each other. Additionally, patients and caregivers should be vigilant of common EHR-related safety issues, check their records carefully, and immediately report any potential issues to their physician.

There are also important long-term opportunities that could improve EHR safety. The Joint Commission could adopt the Leapfrog CPOE EHR simulation tool or include other EHR safety assessment methods as part of their hospital accreditation program, which would bring greater focus to these safety issues. The Joint Commission could begin with very basic standards that require hospitals to attest to using an EHR safety assessment tool and then improve rigor over time,

eventually moving to requiring evidence of safety assessment tool use. The certification of EHR technology should also be optimized to include a greater focus on EHR safety. The Office of the National Coordinator for Health Information Technology (ONC), the US Department of Health and Human Services agency that oversees EHR technology, should include safety certification criteria as part of their voluntary certification program. Safety-focused certification criteria could serve to establish a much-needed basic safety standard. However, relying on EHR product certification alone is not enough, as EHRs are often configured, customized, and maintained by each health care facility in different ways. In addition, a safety reporting system, like those that exist for medications and medical devices, should be created for EHRs so that health care practitioners have a place to report safety issues and analysis can be performed to identify trends, allowing for focused improvement efforts.[7] Finally, EHRs have fundamentally changed the way medicine is practiced, and continued research is needed to support realization of all the potential benefits of this technology and to identify safety issues and mitigation strategies. Research requires investment from the Agency for Healthcare Research and Quality, the National Institutes of Health, and other organizations.

Although the study by Classen et al reports modest EHR safety progress over 10 years, they also report that hospital participation increased 10-fold, suggesting recognition of EHR medication safety challenges and a desire to improve. With several opportunities for near- and long-term EHR safety improvements, stakeholders can work together to advance EHRs to keep patients safe and deliver the best care possible.

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