Partnership Update
June 2019

Data Snapshot: An Undesirable Consequence of Usability Within the EHR

Background

While there are significant and obvious benefits to using technology in the clinical setting, usability remains a challenge.

Usability is "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use." (ISO9241) Usability represents an important yet often overlooked factor impacting the adoption and meaningful use of electronic health record (EHR) systems. Without usable systems, doctors, medical technicians, nurses, administrative staff, consumers, and other users cannot gain the potential benefits of features and functions of EHR systems." (NIST)

Usability comprises features that contribute to the human-computer interface design and includes the display of text and numeric information; screen layout; user friendliness that facilitates easy navigation; data legibility; color of the screen and text displayed; and recently, the size of the monitor has been mentioned as something that could influence provider burden by making the EHR easier to read.

The EHR usability feature addressed in the reported event below highlights the importance of displaying numeric text that is clear and legible; especially when the numeric text is displayed within a grid, table, or graph.

The following reported event was submitted under the protection of the ECRI Institute PSO and reviewed by patient safety analysts for sharing lessons learned.

Case Study Event

An elderly female patient was receiving electroconvulsive therapy (ECT)—a carefully controlled amount of electricity directed at a specific area of the brain—for severe mental illness. ECT is administered under anesthesia and with muscle relaxant medications.

During the 8th ECT treatment, the patient received two anesthesia medications—methohexital 170 mg (anesthetic used to put a patient to sleep before the procedure) and succinylcholine 140 mg (paralytic that relaxes muscles during the procedure). The treatment was documented as uneventful.

Prior to this patient's 9th ECT treatment, the anesthesia provider and postanesthesia care unit staff reviewed the electronic anesthesia report from the 8th ECT treatment to identify the medications and medication doses administered. The anesthesia report included a medication grid display.

The clinicians looked at the grid and, mistakenly reading the numbers as two digits, interpreted the doses as methohexital 70 mg and succinylcholine 40 mg (instead of 170 mg and 140 mg, respectively). These lower doses were administered during this subsequent treatment. The patient experienced an unanticipated reaction to the 9th procedure and required the administration of an IV sedative to alleviate agitation and delirium.

This event illustrates how EHR usability can introduce risk and impact patient safety. What can we learn from this event?

Contributing Factors

When reviewing the previous anesthesia report in the EHR prior to the ninth treatment, the clinical team looked at the doses displayed on the medications grid. As seen in the graphic below, the numeral “1” of the doses (170 mg, 140 mg) overlapped the vertical line of the grid; as a result, lower doses of both anesthetic medications were administered.
Insufficient lighting in the procedure room; the size and orientation of the monitor display; the distance between the user and the device; the color of the text and gridlines on the report display; and possibly other distractions could have contributed to the misinterpretation of the medication doses on the prior anesthesia report.

**Lessons Learned**

The clear display of medication information (e.g., drug name, dose, units) within the EHR can improve the safety of ordering, administration, and dispensing medications. Display of medication information, including doses administered, that is unclear or obstructed by artifacts can increase the opportunity for error.

Legibility is important. In this instance, it was important that numbers could be easily read and understood by the clinicians. Recommendations in the *Electronic Health Record Design Patterns for Patient Safety* developed by the Electronic Health Record Association state that table cells should be “large enough to display complete entries.”

**Conclusion**

Text and numeric information displayed on computer screens and within designed reports that are automatically generated and stored in the EHR must be easy to read and understand by all clinicians providing patient care, regardless of setting. Reports designed for systems that collect significant amounts of numerical data and text that is displayed on grids, such as anesthesia information systems, should be tested and validated by the clinicians who typically use these systems prior to implementation to ensure accuracy and usability of displays. It is important that the data is displayed appropriately, to mitigate any potential hazards that could lead to misinterpretation of data and its subsequent impact on patient safety.

**Important Announcements**

**Registration Open for 2019 Annual In-Person Meeting**

Join your colleagues at the Inn at Villanova on September 12, 2019, for our annual meeting, *Taking Action: Making Health IT Safety a Reality*. Included at this year’s meeting is information from the Office of the National Coordinator for Health Information Technology, lessons learned from EHRA, and 2019 Partnership project updates. Also expect interactive expert panel discussions on today’s hot topics. We look forward to your participation.

To obtain more information and register for the meeting, click here.

**Quarterly Meetings**

The next quarterly meeting will be held on July 23rd at 3:00 p.m. EDT. Before the meeting, you will receive an email that will include registration and web conference access information.

Recordings of the previous quarterly meetings are available here on the Partnership's website.

**Partnership News**

We are excited to announce the release of our latest toolkit, *Safe Practices for Drug Allergies – Using CDS and Health IT*.

**Expert Advisory Panel**

David W. Bates, MD, MSc  
Kathleen Blake, MD, MPH  
Pascale Carayon, PhD  
Tejal Gandhi, MD, MPH  
Chris Lehmann, MD  
Peter J. Pronovost, MD, PhD  
Daniel J. Ross, MD, DDS  
Jeanie Scott, MS, CPHIMS  
Patricia P. Sengstack, DNP, RN-BC, CPHIMS  
Hardeep Singh, MD, MPH  
Dean Sittig, PhD  
Paul Tang, MD, MS

The *Partnership for Health IT Patient Safety* is sponsored through funding from the Gordon and Betty Moore Foundation.
This new resource was developed with the goal of identifying how use of health IT can help to implement existing multidisciplinary recommendations to prevent potentially harmful medication interactions; and provides actionable safe practice recommendations. The toolkit can be found here on the Partnership's website.

Project Updates

Closing the Loop Implementation Workgroup

The Closing the Loop on Test Result Tracking Implementation workgroup is aimed at helping ambulatory clinics improve their test results tracking processes. We look forward to sharing this experience and lessons learned.

Prototype Project Workgroup

Project participants recently met on June 5th. Nine provider organizations from across the U.S. and four EHR vendors are participating in the prototype project. All nine facilities have installed, tested, and validated the retract-and-reorder (RAR) query. They have also received their unique anonymous credentials which will allow them to submit unidentified information related to their RAR events to an ECRI-owned SharePoint site.

The project will test the ability to derive information using system data and clinical correlations for patient safety issues. It will also determine if information submitted and aggregated can help inform areas for safety awareness and improvements.

We Want to Hear from You

It is important not only to develop safe practices, but also to implement them. To assess and measure their effectiveness we need your help in learning how these practices have enhanced safety within your organization.

If your organization/practice has implemented any of the Partnership's health IT safe practice recommendations, we would like to hear from you.

What has your experience been? Have you been successful? Did you have difficulty implementing these practices? How did you measure the outcomes? Start the conversation by emailing your responses and questions to hit@ecri.org.
Collaborating Organizations

Working Together:

Need to Submit an Event?
Partnership participants can submit events through your membership portal.

If you need assistance, please contact us at hit@ecri.org.

Get in Touch with the Partnership
Do you have questions about any of these articles? Get in touch with us today by e-mailing hit@ecri.org. If you wish to submit information for this publication, please submit items for the Update using the subject line “Partnership Update” to hit@ecri.org.

The Partnership for Health IT Patient Safety is sponsored through funding from the Gordon and Betty Moore Foundation.

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