

What's New in the Patient Safety World

January 2013

More IT Unintended Consequences

Health IT has provided many tools that have been helpful in improving patient safety. Yet the technology has also give rise to some unintended and unwanted consequences that have been detrimental to patient care (see list of our many prior columns on this at the end of today's column).

The Pennsylvania Patient Safety Authority recently reviewed its adverse events database for events related to healthcare IT ([Spannon 2012](#)). They identified over 3000 reports over an 8-year period in which IT errors were considered root causes of untoward events. Errors related to medications and lab tests dominated. In almost 90% of cases the IT error was not reported to be associated with patient harm and in most of the rest the error created unsafe conditions but no actual harm. But there were cases in which harm did occur. An example was a patient who was allergic to penicillin developing anaphylaxis after being given ampicillin. The information about the allergy had been entered into part of the EHR that was not linked to the allergy portion of the pharmacy computer system that would have triggered an alert if the allergy had been recognized.

The PPSA developed a taxonomy for IT errors that modified and expanded the taxonomy developed previously by Magrabi et al. ([Magrabi 2012](#)). Examples were given for **input errors**. These included transposition and transcription errors, entry of wrong physician names, entry of incorrect patient parameters that trigger calculations, entry using wrong units (eg. pounds rather than kilograms), and data entered into wrong fields. There were frequent problems with **default values**. Such might be related to a clinician failing to change default values when they should be changed or to the system reverting to default values. The latter often happens with start times for an order. For example, we might write an order for a medication we want started now but the computer may default that order to the next "standard" time of medication administration resulting in a delay or omission of an important dose. Another category of error included **failure to update data**. An example might be failure to enter a new lab value that was important for calculation of a medication dose.

Especially bothersome are situations where paper-based computer-based systems are being used at the same time. An example might be a patient admitted via the emergency department where a medication given in the ED does not get documented in the inpatient HER so the patient gets a second dose upon arrival to the inpatient unit.

One of the concerns identified is that errors in IT systems tend to get propagated far more easily than did errors in the paper chart. That's because the IT systems are interconnected to so many other systems.

The timely PPSA review highlights the need for systems to IT-related adverse events and near-misses. You'll recall that a year ago the Institute of Medicine issued a report recognizing that the benefits of health information technology are accompanied by unwanted consequences and risks to patient safety ([IOM 2011](#)). That report called for greater oversight by the public and private sectors and recommended the secretary of the U.S. Department of Health and Human Services should publish a plan within 12 months to minimize patient safety risks associated with health IT and report annually on the progress. Moreover, it called for the FDA to exercise its authority to regulate these technologies. Specifically, it recommended HHS should establish a mechanism for both technology vendors and users to report health IT-related deaths, injuries, or unsafe conditions. Moreover, it suggested Congress establish an independent federal entity to investigate patient deaths, injuries, or potential unsafe conditions associated with health IT.

The IOM report noted serious errors involving these technologies resulting in patient deaths and injuries. Examples given included medication dosing errors, failure to detect fatal illnesses, and treatment delays due to poor human-computer interactions or loss of data. It also recommended better design to avoid alert fatigue and the need for computer interfaces need to be more intuitive for users.

It recommended development of criteria and methods for assessing and monitoring safety and measuring impacts of health IT on safety. It also recommended better information sharing about unintended consequences and panned the nondisclosure agreements and "hold harmless" clauses in many IT vendor contracts that shift the liability of unsafe health IT features to care providers.

Well, it's a year later and the ONC (Office of the National Coordinator for Health IT) has just released its proposed its Health IT Patient Safety Action and Surveillance Plan for public comment through Feb. 4, 2013 ([ONC 2012](#)). It is designed to help provide necessary data through reporting adverse event for developers, providers, researchers and policymakers to improve the safety of health IT and make care safer. ONC will work closely with the Centers for Medicare & Medicaid Services (CMS) to align its health and safety standards and guidance for providers and suppliers. CMS will also develop training for surveyors that enhances their ability to identify safe and unsafe practices associated with health IT. The Health IT Safety Plan's goal is to "Inspire Confidence and Trust in Health IT and Health Information Exchange," by taking steps to:

1. Use health IT to make care safer
2. Continuously improve the safety of health IT

The new plan will take advantage of the Agency for Healthcare Research and Quality's ([AHRQ Common Formats](#)) with common definitions and reporting formats to improve how adverse event data is gathered, reviewed and reported. AHRQ will also encourage

reporting to Patient Safety Organizations (PSOs) and increase health care provider adoption of the formats. The appendices included in the plan include a cross-walk between recommendations in the IOM report and actions in the ONC plan.

Two unintended consequences of healthcare IT made ECRI Institute's 2013 Top 10 Health Technology Hazards ([ECRI 2012](#)). The first involves **patient/data mismatches**, which can result from either human error (eg. data input) or from system errors, poor user interfaces, design or workflow issues, software flaws, etc. Especially vulnerable are times when data is transferred from one system to another. They provide multiple examples and recommendations on ways to minimize the risks involved. The second involves **interoperability failures** between Health IT systems and medical devices. They discuss failures of communication between physiologic monitoring devices and a variety of other devices. They also note that errors may be detected in one system and manually corrected in that system but that no one recognizes the error is now in the Health IT system and has not been corrected there. As usual, ECRI's annual Top Technology Hazards issue is timely and very useful and available for free download.

Speaking of user interfaces, another interesting phenomenon was recently reported at the American Society of Nephrology annual meeting. The problem of "**cognitive drift**" was reported as potentially giving rise to medical errors in those using the EHR ([Onuigbo 2012](#)). This refers to what happens when there is a **delay between a mouse click and what appears on the computer screen in response to that click**. In a survey of ICU physicians, the authors noted that most doctors begin to lose focus if that delay is greater than 10 seconds. Virtually all of the ICU physicians who responded to the survey reported experiencing such "cognitive drift" several times a day and cited this as a source of significant frustration, stress and possible burnout.

Healthcare IT also has been in the news recently for another unwanted reason: its cost. A huge part of the projected savings in the Affordable Care Act comes from anticipated savings resulting from widespread adoption of EHR's by hospitals and physicians. Such savings is anticipated because EHR's, in theory, should improve quality, reduce adverse events, foster better preventive care, reduce duplication, and improve continuity of care across all levels of the continuum. However, the empiric data to date does not confirm such savings. In fact, the early data suggests the opposite. The OIG's report ([Levinson 2012](#)) suggests that hospitals and physicians substantially increased their billings to Medicare in 2010 compared to prior years. Specifically, there has been a shift in physician billing for higher E&M (evaluation and management) codes and it is suspected that EHR's make it easier to justify the higher coding. They found that approximately 1700 physicians who consistently billed the top 2 level E&M codes in 2010 accounted for about \$108 million in Medicare costs.

Another surprising finding also has cost implications. Part of achieving meaningful use for EHR's requires providing patients access to a variety of computerized resources. It has always been presumed that patients having access to their EHR and ability to communicate with their physicians via means other than face-to-face visits would

improve efficiencies and quality and ultimately lead to lower utilization and lower healthcare costs. But a recent study done at Kaiser Permanente Colorado ([Palen 2012](#)) unexpectedly showed that patients having online access to their medical records and clinicians was associated with significantly increased utilization of services. Of course, that study does not prove causality. Rather it may be that patients who need more services were more likely to get and use the enhanced IT access. Nevertheless, this association certainly raises the possibility of another unintended consequence.

We are still strong believers that ultimately healthcare IT will deliver on the quality and patient safety side and has the potential to reduce healthcare costs. However any cost savings, if it is to occur at all, is not likely in the immediate or near future.

See some of our other Patient Safety Tip of the Week columns dealing with unintended consequences of technology and other healthcare IT issues:

- June 19, 2007 “[Unintended Consequences of Technological Solutions](#)”
- May 20, 2008 “[CPOE Unintended Consequences – Are Wrong Patient Errors More Common?](#)”
- June 17, 2008 “[Technology Workarounds Defeat Safety Intent](#)”
- August 26, 2008 “[Pattern Recognition and CPOE](#)”
- September 9, 2008 “[Less is More...and Do You Really Need that Decimal?](#)”
- December 16, 2008 “[Joint Commission Sentinel Event Alert on Hazards of Healthcare IT](#)”
- February 2009 “[Healthcare IT The Good and The Bad](#)”
- October 2009 “[A Cautious View on CPOE](#)”
- November 24, 2009 “[Another Rough Month for Healthcare IT](#)”
- April 20, 2010 “[HIT’s Limited Impact on Quality To Date](#)”
- June 26, 2012 “[Using Patient Photos to Reduce CPOE Errors](#)”
- June 2012 “[Leapfrog CPOE Simulation: Improvement But Still Shortfalls](#)”
- July 17, 2012 “[More on Wrong-Patient CPOE](#)”

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