Crying Wolf: Over-Alerting by EMRs Is Annoying, Distracting, and Dangerous

By now, everyone in HIT has heard about “alert fatigue.” What is less widely recognized is just how dangerous it is, both to the health of your clinical IT strategy and to patients themselves. Following the release of a study of deaths due to over-alarming by biomedical equipment in hospitals, the Joint Commission has indicated that it plans to make “alarm fatigue” a special focus area in 2011. Electronic medical record (EMR)-generated alert fatigue can be just as dangerous. With an understanding of its origins and proper attention to system design, over-alerting can be minimized.

The Problem

Today’s electronic medical record (EMRs) generate a variety of alerts to clinicians in different situations via different clinical decision support system (CDSS) modules and mechanisms. In some circumstances, alerts are valuable and can prevent dangerous errors, or remind physicians to monitor a medication or treatment. However, many of these alerts are ineffective and overridden by clinicians. In typical hospital computerized practitioner order entry (CPOE) implementations, drug-drug interaction and drug-allergy alerts are frequently overridden at ratios of 20-to-1 or even higher. What are the results of such ineffective CDSS?

- Physicians become frustrated. Frequent display of irrelevant and un-actionable alerts fosters a belief (and may reinforce a preexisting suspicion) that the EMR is there to reduce costs and help hospital administrators, not to improve patient care.
- Provider frustration adversely shapes their attitudes toward the EMR and may poison future EMR implementation and improvement efforts, making it harder to engage them in CDSS design and system implementation next time.
- Physicians soon start ignoring all alerts—including the occasional one they should attend to.
- Paradoxically, physicians can ignore alerts while also developing a belief that since the system alerts to so many things, it must be catching everything that is potentially dangerous—so if it does not generate an alert, an order must be safe.

Why Does It Happen?

Alert fatigue can develop around many kinds of CDSS. Some of the best illustrations involve drug safety alerts. Because adverse drug events (ADEs) are one of the most common categories of harm to patients related to medical care, medication safety is naturally a first priority for CDSS implementation. But doing so successfully is a challenge. A list of some of the common sources of over-alerting and alert fatigue is presented below.

1. **Drug Safety Alerts: Dependence on out-of-the-box CDSS from commercial drug databases.** These databases are essential components of modern EMRs. They catalog and maintain current information on a comprehensive list of medications, including information on routes of administration, dosing and dose adjustments, side effects, and different formulations. The problem is the lack of specificity of drug interaction CDSS rules. The information in these databases is derived from drug package inserts, and contains virtually every reported adverse reaction or interaction. Their rules base cross-references all of these interactions, and fires an alert when two potentially interacting medications are co-prescribed. The systems can be set to different levels of sensitivity, but due to very conservative interpretations by the vendors, even at the most discriminating (e.g., least sensitive) setting they still generate many alerts that are irrelevant from the physician’s point of view.

2. **Alerts based on suspect user-entered data.** A good example is the frequent high override rate of medication-allergy alerts. At many organizations, allergies can be added to the EMR by almost anyone with system access, and often the nature and severity of the reaction is not documented. For example, a patient may tell an admission clerk, “That medicine made me...”

1 Groups target alarm fatigue at hospitals. The Boston Globe, April 18, 2011.

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throw up.” Odds of this being a genuine allergy are low, but the conscientious clerk adds it to the patient’s allergy list. After physicians see a few alerts based on this kind of data, they become inclined to ignore the computer’s alerts and rely on the allergy history they obtained personally.

3. **Lack of provider and context specificity.** Some CDSS types may give providers information that is patient-specific and true, but not relevant to them or to the time and place. For example, a system may inform a neurosurgeon that because their patient is a diabetic and it has been a year since her last foot exam, the patient should receive one. That piece of CDSS is going to be ignored by the neurosurgeon. The information is meaningful to the patient’s primary care physician (PCP), and should be presented by a registry function at the time of her next PCP visit, but not to a subspecialist who does not have the time, needed skills, or inclination to do it. This is particularly a hazard when EMRs designed for primary care are implemented for specialists with inadequate practice-specific modification.

4. **Alerts are obnoxious.** There is no way around it. Alerts interrupt the provider’s workflow and train of thought, and if they do not provide information of high value right now, all they do is annoy the user.

**Action Items**

Organizations can take a number of steps to reduce over-alerting.

- **Deliver the appropriate—and different—kinds of medication safety CDSS to the physician and to the pharmacist.** CPOE alerts driven by a commercial drug database should be set at the least sensitive level. More sensitive and exhaustive decision support may be appropriate in the pharmacy system, but prescribers should not be subjected to it. Organizations must be willing to have the difficult discussions between physicians and pharmacists needed to develop an approach that is appropriate and effective for critical alerts.

- **If possible, customize your implementation of commercial drug database rules to limit further the list of alerts that fire.** This may be done by working with the drug database vendor and/or modifying the behavior or rules elsewhere within the EMR implementation. Decisions on how to modify alerts should be made jointly between physicians and pharmacists, preferably in the setting of a formal governance committee. Legal concerns should be addressed in the spirit that advice ignored is worse than no advice at all, and appropriate customization can lead to greater attention to all alerts.

- **Take responsibility for allergy management within the EMR and in your patient care processes.** Specify which clinician types can enter allergies, and mandate the recording of the nature and severity of the reported reaction in the EMR.

- **Use less intrusive, more workflow-friendly CDSS whenever possible, and use alerts only as a last resort.** Effective implementation of order sets can support clinicians by helping them do the right thing in the first place. CDSS types that incorporate multiple kinds of patient-specific data—medications, diagnoses, laboratory trends—will be perceived by clinicians to be valuable and welcome. They will also be far more likely to result in real reductions in adverse event (AE) s.

- **Use provider- and context-appropriate CDSS.** The method of decision support should fit the provider’s clinical focus and workflow.

- **Periodically (perhaps at least quarterly) monitor your decision support logs to determine which elements are adhered to versus overridden, as well as why.** Strive continuously to improve the specificity and effectiveness of your CDSS.

- **CDSS should be managed by an appropriate governance structure, led by clinicians, not IT.** CDSS governance committee membership should include the CMO, CMIO, physicians from different clinical domains, clinical pharmacists, nursing, and clinical IT; and the committee should have a strong tie to the organization’s Pharmacy and Therapeutics Committee.

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