

Improving Patient Safety by Combating Alert Fatigue

Electronic drug alerts have been shown to reduce adverse drug events, resulting in fewer deaths, disabilities, hospitalizations, and lower health care costs.¹ Drug alerts, however, are not always beneficial, and patient harm can occur when low-value or false-positive alerts appear. One study showed that 331 alerts were needed to prevent 1 adverse drug event.¹ It is estimated that 90% of medication alerts are overridden by prescribing physicians,² and more than half of overrides were due to alerts being deemed irrelevant.³ A large number of irrelevant alerts may result in alert fatigue, which has been defined as “declining physician responsiveness to a particular type of alert as the clinician is repeatedly exposed to that alert over a period of time . . . ,”⁴ which may result in critical warnings being missed. The ECRI Institute, a nonprofit medical safety organization, listed alert fatigue as a top technology hazard.⁵ The consequences are illustrated when a child received 38 times the normal dose of an antibiotic largely due to this information being overshadowed by a number of clinically inconsequential alerts.⁶

We conducted a quasi-experimental study to evaluate the extent of low-value alerts and reduce excessive warnings, while preserving critical alerts. All medication alerts for May and June 2014 at an academic dermatology clinic were assessed to determine their relative importance. Alerts were designated as a low, moderate, or high value based on the judgment of 3 dermatologists, and through Micro-medex software (Truven Health Analytics, Ann Arbor, MI) to evaluate possible drug interactions. Criteria to determine the value of each alert included clinical utility, patient safety benefit, evidence-based warnings, and warning values already built into the EPIC electronic health record (EHR). Over 10 months, several meetings were conducted with information systems and EHR committee representatives to designate and suppress low-value alerts. These included unnecessary duplicate orders (eg, ketoconazole cream ordered for the face and ketoconazole shampoo for the scalp); duration of topical steroid use warnings (topical steroids used longer

TABLE
Number of Alerts and Percentage Change Over 1 Year

	May–June 2014	May–June 2015	% Change	P Value
Low-value alerts	572	415	-27.4	< .0001
Moderate-value alerts	55	53	-3	.85
High-value alerts	58	41	-29.4	.09

than the US Food and Drug Administration indication); and an inexplicable oral antibiotic “contraindication” with topical tretinoin. These categories made up the majority of low-value alerts. Medication alerts for May and June 2015 were analyzed for comparison.

In May and June 2014, a total of 572 low-value alerts were recorded, in contrast to 415 low-value alerts for May and June 2015. The test of a single binomial proportion indicates a 27.4% reduction in low-value alerts with a 95% confidence interval (22.1%–32.8%), which was statistically significant. The data shown in the TABLE demonstrate a desired outcome: a significant reduction in low-value alerts, while preserving the moderate- and high-value alerts.

We encountered several challenges, including considerable subjectivity in grading alerts, with dermatologists differing in their impression of the value of certain alerts. Physicians from different specialties also may need different alerts. While dermatologists are sensitized to the importance of not overusing topical steroids, primary care physicians may welcome this alert. If there is any concern over the usefulness of a particular alert, it is usually best to leave it alone and determine the value as it arises. Finally, EHR committees may be hesitant to modify warnings. However, a recent study showed that modifying alerts can decrease alert fatigue without increasing the risk of adverse event and subsequent litigation.⁷

We demonstrated a successful reduction in low-value alerts, representing a major contributor to alert fatigue. Training and culture change is needed to address flaws in the EHR that contribute to alert fatigue, and work in this area at our institution is ongoing.

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