

## Overriding Computerized Alerts in Primary Care

Weingart SN, Toth M, Sands DZ, et al. Physicians' decisions to override computerized drug alerts in primary care. *Arch Intern Med* 2003;163:2625–31.

### Study Overview

**Objective.** To calculate the override rate for computerized drug allergy and drug interaction alerts and determine the clinical consequences.

**Design.** Retrospective cohort study.

**Setting and participants.** Consecutive drug allergy and drug interaction alerts generated via a computerized physician order entry (CPOE) system at 5 adult primary care practices during a 4-month period.

**Main outcome measures.** The override rate for 3481 drug allergy and drug interaction alerts was calculated. For a random sample of 189 alerts, a detailed review of the patient record was completed to identify the factors associated with the physicians' decisions to override a medication alert and determine whether an adverse drug event (ADE) occurred.

**Main results.** Physicians overrode 91.2% of drug allergy and 89.4% of high-severity drug interaction alerts. Factors associated with accepting the alerts were: house officer status (odds ratio [OR], 0.26 [95% confidence interval {CI}, 0.08–0.84]) and a high number of patient allergies (OR, 0.70 [95% CI, 0.53–0.93]). Alerts occurring during renewal prescriptions were much more likely to be overridden than alerts occurring during new prescriptions (OR, 17.74 [95% CI, 5.60–56.18]). No ADEs were found in cases when alerts were accepted compared with 3 ADEs when alerts were overridden ( $P = 0.55$ ). Physician reviewers judged that 36.5% of the alerts were inappropriate.

**Conclusion.** Physicians overrode the majority of alerts for drug allergy and drug interactions in primary care, and no significant number of ADEs occurred, suggesting the threshold for alerting was set too low. CPOE systems should suppress alerts for renewals of medication combinations that patients currently tolerate.

### Commentary

CPOE is a technology that promises to bring greater precision and more informed decision making to the practice of medicine. Chief among the potential benefits of CPOE is improved drug prescribing. In addition to the greater accuracy of a typed prescription, CPOE, when integrated with an electronic patient record, can alert physicians to a drug allergy, a drug interaction, and drug toxicities or contraindications apparent in laboratory data, and can guide drug dosing based on known patient characteristics. The 2 categories of alerts studied in this retrospective series are commonly implemented in CPOE systems, yet it is unclear whether they effectively improve care, particularly in busy primary care settings. The finding that physicians overrode about 90% of these alerts and that many of these decisions were justified is an important step towards reengineering alerting systems.

The authors discovered problems with drug interaction alerts that are likely common in other systems: (1) 21% of the alerted interactions were not considered clinically significant by physician reviewers, (2) 21% of the interactions were not significant because the patient had already tolerated the combination, and (3) in 21% of cases the benefits of the drug outweighed the risks. The first 2 problems are correctable with an improved knowledge base and suppression of alerts with renewal prescriptions. The third is not easily modifiable, and some lower frequency of overrides still will be necessary. A fundamental problem for many reported drug interactions is the lack of evidence describing adverse outcomes in humans. Retooling the alert knowledge base to focus on those interactions where the toxicities are more frequent and better understood (eg, warfarin interactions) should substantially improve physician reactions to these alerts. Reducing the number of alerts and providing stronger feedback when necessary also should reduce "alert fatigue," where alerts are disregarded even when severe and supported by accurate data.

The high override rate with drug allergy alerts may reflect problems with the way that allergies are collected and coded.

For instance, intolerance to one opiate (eg, dose-related constipation) would not contradict the use of another and should not trigger an alert. The authors deduced that many of the overridden allergy alerts were because of intolerance rather than true allergy. Drug intolerance should be an explicit coded field in outpatient electronic medical records, but it should not trigger an alert when prescribing medications.

**Applications for Clinical Practice**

High override rates for drug decision support alerts should lead to redesign of the underlying alert knowledge base and attention to the quality of recorded patient information.

*—Review by Josh F. Peterson, MD, MPH*

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