An International Evaluation of Drug-Drug Interaction Alerts That Should be Non-Interruptive in U.K. and U.S. Settings

PARTNERS HEALTHCARE
FOUNDED BY BRIGHAM AND WOMEN'S HOSPITAL AND MASSACHUSETTS GENERAL HOSPITAL

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Background

- Clinical Decision Support (CDS) has the potential to improve patient safety by providing knowledge and support at the point of prescribing.
- CDS often deliver an overdose of alerts which result in 'alert fatigue'. As a consequence, providers may overlook clinically significant alerts.[1]
- Phansalkar, et al.[2] identified a set of alerts based on recommendations from an expert panel which could be safely made non-interruptive with the goal to reduce alert fatigue.
- Objective: assess these interruptive alerts currently in use in 3 U.S. and U.K. Electronic Health Record (EHR) systems to evaluate their override rates.

Methods

Setting

- Interruptive alerts from 3 in-house developed EHRs were assessed in 2 academic medical centers:
  - U.S. (Boston): level 2 inpatient/outpatient alerts
  - U.K. (Birmingham): level 3 inpatient alerts

Data Collection

- All low priority interruptive drug-class and class-class alerts generated from Jan 2009 to Dec 2011 were collected.
- In the U.S. EHR, coded reasons at the point of level 2 alert override are required. The number of overrides and coded reasons were collected.
- In the U.K. EHR, level 3 alerts require a tick box acknowledging receipt of level 3 alert information before placing an order. No override reasons are required. The number of overrides were collected.

Data Analysis

- Calculation of the number and percentage of each type of low priority alert generated and overridden was assessed.

Results

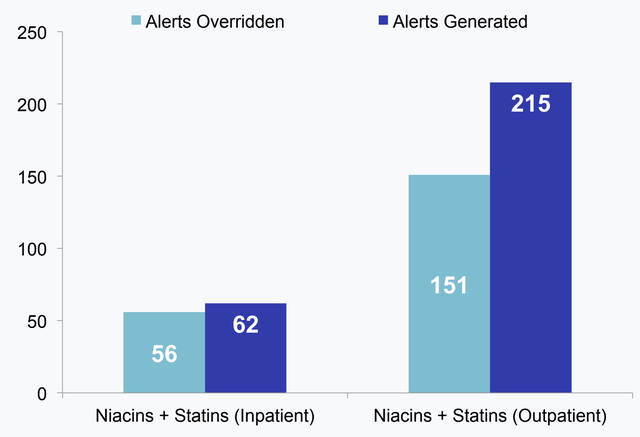
Low-priority class-class alerts that were triggered in the U.S. and U.K. systems

Object Drug/ Class	Precipitant Drug/ Class	Alerts in U.S.	Alerts in U.K.
ACE Inhibitors	Angiotensin II receptor antagonists	-	√
ACE Inhibitors	NSAIDs	-	√
Anticoagulants	Corticosteroids	-	√
Niacin	Statins	√	-
NSAIDs	β-Adrenergic blockers	-	√
Proton pump inhibitors	Imidazoles	√	-
Sulfonylureas	ACE inhibitors	-	√
Thiazide-type diuretics	NSAIDs	-	√

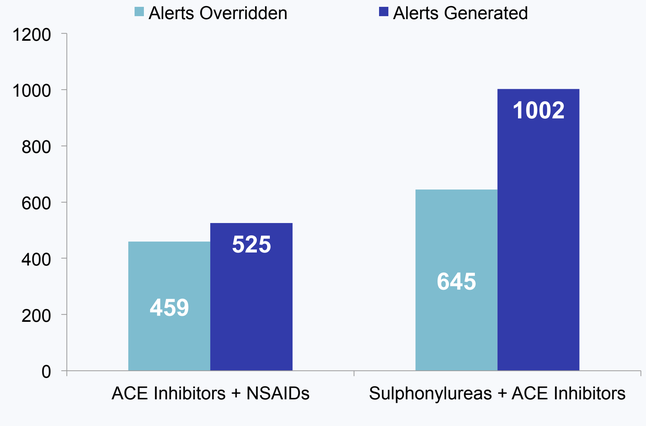
- Two of the 33 low priority drug-class and class-class interactions were set as interruptive in the U.S. systems and triggered a total 301 alerts, which were overridden in 77.7% of cases (n=234).
- In the U.K. system, 8 low priority class-class interactions triggered a total 2,354 interruptive alerts, which were overridden in 63.5% of cases (n=1,495).

* As described by Phansalkar, et al.[2]

United States: class-class low priority alerts* triggered and overridden most often



United Kingdom: class-class low priority alerts* triggered and overridden most often



Key Points

U.S. System

In the U.S. system, the **Niacin + Statin** interaction was triggered and overridden most often in both inpatient and outpatient systems.

Setting	*Triggered*	*Overridden*	*Rate*
Inpatient	62 (95.4%)	56	90.3%
Outpatient	215 (90.7%)	151	70.2%

U.K. System

In the U.K. system **Sulfonylureas + ACE Inhibitors** triggered 42.6% of all class-class alerts (n=1,002), which were overridden in 63.4% of cases (n=645).

- Gliclazide/gliclazide MR and perindopril accounted for more than half (55.4%, n=556) with a 69.6% override rate (n=387).

ACE Inhibitors + NSAIDs occurred second most often (22.3%, n=525) with an 87.4% override rate (n=459).

- Ramipril and Ibuprofen (drug-drug) accounted for more than half (52.4%, n=275) and were overridden in 90.1% of cases (n=248).

Conclusions

- This study offers further validation of the non-critical alerts previously identified to understand user response to these alerts.
- It was previously shown that these alerts may be safely made non-interruptive in providers' workflows, thus reducing alert fatigue.

References

1. Weingert SN, et al. Clinicians' Assessments of Electronic Medication Safety Alerts in Ambulatory Care. *Arch Intern Med* 2009; **169**: 1627-32.
2. Phansalkar S, et.al. Drug-Drug Interactions That Should be Non-Interruptive in Order to Reduce Alert Fatigue in Electronic Health Records. *J Am Med Inform Assoc* 2012. Sep 25.