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Title: Evidenced Based Clinical Decision Support for e-Prescribing and Administration to Reduce Alert Fatigue

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Introduction:

Electronic health systems with built in alerts are increasingly used worldwide. Software for prescribing and administering medicines (MedChart®) is being introduced into New Zealand Hospitals. MedChart® can be configured to provide a variety of alerts, including some that notify prescribers about potential medication safety issues. The intent of these alerts is to reduce medication errors and thus improve patient care.

In electronic health systems alerts traditionally aim for sensitivity over specificity - ie. providing all potentially relevant alerts, rather than those that are the most salient. This means that most alerts are not useful to the person receiving them. When the majority of alerts are irrelevant it can lead to a phenomenon labeled “alert fatigue”. “Alert fatigue” describes how users (in this case prescribers) become desensitised and as a result miss critical alerts. Studies have shown that physicians override computerised alerts up to 95% of the time. Alert fatigue is a major complication of the computerisation of healthcare and one of the reasons that the potential benefits of alerts are not fully realised in practice.

With alert fatigue in mind, when Canterbury District Health Board (CDHB) began rolling out MedChart®, they locally configured alerts instead of using the vendor supplied ones. This was done with the aim of improving overall patient outcomes. However, the total number of alerts occurring in CDHB MedChart® and the impact (if any) these alerts have on prescribers was not known.

The goal of this project was to evaluate the prescribing alerts in CDHB MedChart® software and their impact on prescriber’s behaviour.

Aim:

To describe and quantify the MedChart® prescribing alerts in the CDHB.

To describe the user responses to alerts.

Impact:

The results of this study will be used to modify the prescribing alerts at CDHB and may inform such alert systems at other hospitals. Improved prescribing decision support systems are expected to lead to safer prescribing and better patient outcomes.

Method:

Alert data for the period 1 August to 31 December 2016 were extracted from MedChart®. The rate of each alert type and whether or not it was overridden, were analysed using Microsoft Excel and the data visualisation software Tableau.

Results:

There were 35,094 alerts in MedChart® during the five month period (290 per day) associated with 210,233 prescriptions (1,380 per day). Thus 1 in 6 prescriptions triggered an alert (17%).

Looking at the alerts by type, the majority (73.2%) were “prescriber” alerts. This is a varied group of alerts triggered by local “rules” implemented in MedChart®. The most common of these (21%) was a reminder to “prescribe a regular laxative to avoid constipation” – an alert that is triggered by opioid

medicines. The second most common (11%) was a drug interaction warning “This drug increases the toxicity of some other drugs, by inhibiting one or more cytochrome P450 enzymes (CYPs)”. The most common drug triggering prescriber alerts was morphine.

Adverse drug reaction (ADR) alerts made up 15% of the alerts. The most common medicine causing these alerts was morphine, followed by aspirin and then codeine. “Dose range” alerts, warnings about high doses, made up 12%. The most common medicine involved in these alerts was paracetamol and the second most common morphine. When the paracetamol alerts were looked at, a number of these occurred when a patient was being changed from as needed paracetamol to regular paracetamol. When this occurs, any overlap between the two prescriptions will be recognised by MedChart® as being too large a dose, even if the prescriber intended to cancel the first prescription. Unfortunately, from the data we were not able to determine the prescriber intention so we do not know if the alert reminded them to cancel the first prescription, or if it was going to be cancelled anyway.

The limitations of the data mean that we were unable to tell how often the alerts changed prescribing. This is important and needs better data extraction from MedChart® to understand.

Conclusion:

One in six prescriptions in the CDHB MedChart® triggered an alert. Although, this is lower than many other systems it highlights the need to fine-tune the existing alerts and the difficulty of using alerts to improve patient care.