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Project: Antiplatelet/Anticoagulant Drug Interaction Alerts in MedChart™
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Introduction:
Drug interactions occur when two different medicines act together to either enhance or reduce the effects of one or both medicines involved. Using combinations of antiplatelet and anticoagulant medicines ('blood thinners') can play an important role in the treatment of patients with high risk of blood clots, including strokes and heart attacks. However, combining these medicines increases the risk of serious bleeding. Bleeding caused by blood thinning medicines has been shown to be the biggest contributor to serious adverse events and deaths of all drug interactions. A recently issued recommendation from the New Zealand Health Quality and Safety Commission warns against the co-prescribing of two anticoagulant medicines, dabigatran and enoxaparin, due to recorded adverse bleeding events with the combination in the absence of any benefit.

MedChart™ is a computerised programme used in Canterbury District Health Board (CDHB) hospitals in which doctors and other prescribers can order medications for their patients. Within this programme is an alerting system that provides pop-up warnings about medicines that interact. In response to these alerts, prescribers may choose to continue to prescribe the interacting combination or to change their prescription.

Alert fatigue – also referred to as 'cry-wolf syndrome' – is one of the biggest barriers to the appropriate use of alerting systems. When alerts fire often or for reasons that are not perceived to be relevant, prescribers become desensitised to the alerts. Consequently, they may automatically override all alerts, including those that are relevant. It is for this reason CDHB have locally configured the commercial alerting system to create a set of rules more specific for important, clinically relevant drug interactions.

Aim:
To evaluate the responses to alerts for interactions between blood thinning medicines in MedChart™.

Impact
The evaluation of prescriber behaviour in response to alerts is important to keep the alerts current and relevant and prevent alert fatigue. This research found these alerts are working well and will be used to develop alert rules for other classes of medicines.

Method:
Prescribing alert data from 1 August to 31 December 2016 were extracted from MedChart™. Rates of alerts due to combinations of blood thinners were determined.

Medication charts for 280 alerts, from 10 October to 10 November 2016, were looked at in detail to assess their validity. This involved manually recording information from MedChart™, including whether the prescriber changed the prescription within 30 minutes of overriding an alert and any issues with the alerts that could contribute to alert fatigue.

Dabigatran-enoxaparin interaction alerts and prescribers' responses to those alerts were also audited in response to the Health Quality and Safety Commission's recommendation.

Results:
During the period 1 August to 31 December 2016, 1011 blood thinner combination alerts were recorded (average of 7 per day). This corresponds to an alert rate 48/10,000 prescriptions.
Alerts analysed by specialist service under which the patient was admitted showed that the specialties that see these alerts most are Cardiology 23%, General Medicine 16%, Older Person's Health 6%, Orthopaedic Surgery 6% and General Surgery 4%. A specialty could not be assigned to 29% of alerts.

The medicines most likely to trigger an alert were warfarin (30%), dabigatran (24%), enoxaparin (20%) and aspirin (20%).

The number of alerts appeared to be increasing over time while MedChart™ was being implemented through CDHB hospitals. However, projected data for January shows that the blood thinner alert rates appear to have plateaued.

Of the 280 alerts looked at in detail, 19% of alerts were deemed not necessary and potentially fatiguing.

In the evaluation of prescriber responses to blood thinner alerts it was found that in 6% of alerts the prescriber backed out of the prescribing. With 22% of alerts, the alert was initially overridden but a change in prescription occurred within 30 minutes. In 71% of alerts, the alert was overridden and the prescription not changed within 30 minutes.

The dabigatran-enoxaparin combination resulted in 37 alerts. Of these alerts, 28 (76%) resulted in a change in prescription within 30 mins and 9 (24%) remained unchanged.

Conclusion:
From literature of drug interaction alerts it has been reported that only 9-12% of alerts result in a prescription change. Our study demonstrates the modified MedChart™ alerts are more effective than this with 28% of alerts resulting in a change in prescriber behaviour. In particular, 76% of dabigatran-enoxaparin alerts were associated with a change to the prescription.

Studies have reported that 36-39% of alerts are inappropriate and potentially fatiguing. Our study showed a lower rate of 19%, although there is room for improvement.

These results are promising and the current study demonstrates CDHB is doing well compared to quoted literature in preventing alert fatigue. Future work to refine the alert rules may be indicated to further minimise alert fatigue.