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Project: Monitoring and evaluation of an implementation of an electronic prescribing system

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Introduction:
Errors in medication prescribing and administration are a significant cause of patient harm. Electronic Prescribing and Administration software, or ePA, is designed to both reduce errors in prescribing and administration and facilitate better data collection around these activities. ePA improves safety by reducing illegibility of prescriptions (reducing chances for error), increasing the speed to pharmacy, and allowing analysis of real-world data for safety. However, ePA also introduces new risks to patients not present with paper systems; for instance, clicking on the wrong medication or patient from a drop-down list. Hospitals across the world, including in New Zealand are adopting ePA. Creating systems to evaluate and monitor ePA software within hospital settings helps ensure patient safety is not compromised during and following ePA adoption. MedChart is the selected ePA software for New Zealand and is presently being implemented within the hospitals of the Canterbury District Health Board, or CDHB. MedChart does not contain a reporting function to access and extract data from its database. Therefore the CDHB is developing software to generate a reporting layer enabling meaningful data extraction and analysis. This allows reports to be generated on both prescribing and administration of medicines within MedChart and the clinical decision support functions available to users. However the functionality of the reporting software has not been fully evaluated.

Aim:
The aim of the study was to evaluate the functionality of reports generated by a CDHB-developed MedChart reporting software.

Method:
To evaluate the reports, data extracts from 1 May 2015 to 31 October 2015, or 6 month intervals, were generated using the reporting software for 24 prescribing and administration reports. These reports were: 'Stat Orders Outside Of Time', 'Standard Orders Outside Of Time', 'Telephone Orders', 'Administration Events: Event Summary', 'Administered Events: Event Detail', 'Non-Administered Events: Event detail', 'Prescribing Events', 'Prescribing with Administration', 'Prescribing Never Administered', 'Administrations with Prescriptions', 'Prescribing by Administration Date', 'Dose ranges', 'CDS Dose Range', 'CDS Rules Prescribing', 'CDS Rules Administration', 'ADRs Entered Within Period', 'CDS Allergy', 'Prescriptions by Method', 'Active Users Report', 'Prescriptions by Protocol (modified)', 'Prescriptions by Quicklist (modified)', 'Allergies', 'Failure to Administer Drug', 'Patients Prescribed Warfarin'. These reports looked at data from the four CDHB hospitals (Princess Margaret, Burwood, Hillmorton and Ashburton) using MedChart in daily patient care. The reports were then systematically analysed for errors, specifically looking at problems with data extraction, duplicates, missing data fields and incorrect data.

Results:
Seven of 24 reports (29%) did not extract any data – largely due to the size of the data being requested, leading to the software "timing out" before data was extracted. The remaining 17 reports were able to extract data but had other issues. Data duplication was the most common error, occurring in all reports. Over half of the reports, nine of 17 (53%), extracted data other than what was intended and 53% (9/17) also had missing data.

Conclusion:
ePA software is being widely adopted in New Zealand and globally. However the transition from paper medication charts to ePA has many potential risks. Therefore adequate monitoring and evaluation of ePA software is needed. For this monitoring to occur the CDHB is leading New Zealand in developing both a framework for MedChart to be evaluated and creating reporting software to allow extraction of meaningful data from MedChart's electronic database. Systematic evaluation of this software has identified several issues which compromise functionality, consequently risking patient safety as a result of the inability to evaluate CDHB-wide use of MedChart. We are actively working with CDHB Information Services to revise and improve the reporting software. A functioning reporting program will be used to analyse data about medicine use in hospitals, allowing CDHB to realise the gains in safety resulting from implementing ePA in hospitals. This could then lead to changes in policy and guidelines to improve patient care.