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ST. JAMES'S HOSPITAL

Evaluating an Electronic Clinical Decision Support System for Drug-Drug Interactions in a Large Acute Teaching Hospital

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In 2018, St. James's Hospital (SJH) became the first major acute public hospital in Ireland to implement Electronic Prescribing and Medication Administration Record (EPMAR) system.

WHAT IS ALREADY KNOWN?

- Drug-Drug Interactions (DDIs) are a known cause of preventable harm
- Clinical Decision Support (CDS) is a key feature of electronic prescribing (e-Prescribing) software
- 'Alert fatigue' may diminish the effectiveness of CDS
- Use of and research in e-Prescribing systems in Irish hospitals is limited

WHY WAS THIS STUDY DONE?

- To examine the characteristics of the DDI alert CDS set at 'Major-Contraindicated' visibility level in a haematology-oncology setting
- To study the outcomes taken by prescribers in response to DDI alerts
- To determine DDI alert override rate
- To compare against DDIs identified by clinical pharmacists

HOW WAS IT DONE?

This was a 6 weeks quantitative observational study of DDIs obtained from the Cerner® e-Prescribing system-associated CDS, as well as data obtained from the routine clinical review of clinical pharmacists in a haematology-oncology setting.

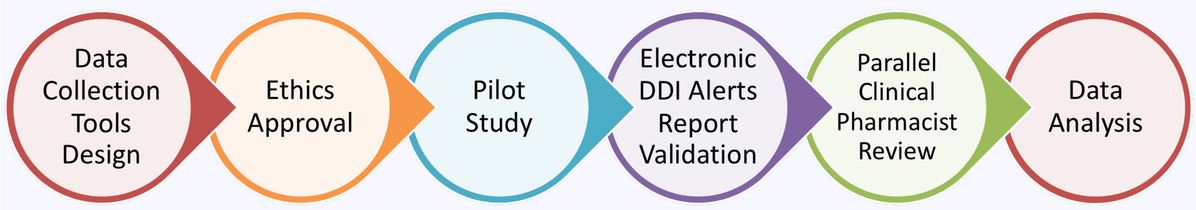

Table 1: Characteristics of DDI alerts

Characteristics	Drug-Drug Interactions Captured by the Clinical Decision Support System
Total number of DDI alerts	310
Number of DDI alerts excluding redundant alerts	252
Total number of drug interaction pairs	44
Total number of individual drugs making up the DDI pairs	38
Most frequent interacting medicine	Domperidone
Most frequent drug interaction pair	"Domperidone-Ondansetron"
Most common interacting medication class	Anti-emetics
Most common DDI adverse outcome	QTc prolongation

WHAT HAS BEEN FOUND?

- There were 310 interruptive DDI alerts of 'Major-Contraindicated' severity generated during the 6 weeks study period.
- 58 alerts were excluded from the analysis as these were considered duplicate and/or irrelevant alerts due to system design and configuration.
- Of the remaining 252 alerts, 44 alerts were accepted; giving a total alert override rate of 83%.

See Table 1 for characteristics of DDI alerts generated by the DDI CDS

- Clinical pharmacists reported 37 additional DDI alerts, 5 of which were accepted by the prescriber by means of discontinuing one of the interacting medications or adjusting dose. The prescribers acknowledged the remainder 32 alerts and ordered extra patient monitoring.

WHAT THIS STUDY ADDS?

- This is the first Irish study describing the characteristics and override rates of DDI alerts.
- The override rate seen in this study is in line with previous international research implementing similar CDS.
- Major findings arising from this study have the potential to increase DDI alert overload and therefore alert override rate including:
  - Medications inputted during the 'Medication Reconciliation' process trigger DDI alerts even when not actively prescribed.
  - Intravenous electrolyte infusion bags trigger DDI alerts, this becomes troublesome when the infusion bag is already administered but not discontinued on the drug chart.
  - The DDI tool is insensitive to the medication route of administration giving rise to irrelevant DDI alerts such as ones between oral domperidone and inhaled salbutamol.
- Pharmacists compared to the automated CDS provide a more nuanced judgment of the clinical significance of interactions. Pharmacists consider several additional variables before raising the alert with the prescriber such as patients' co-morbidities, renal/hepatic function, and laboratory parameters.
- Validation of electronic reports is essential for ensuring accurate interpretation of outcomes.

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Disclosure

"None of the authors of this presentation have to disclose any possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation"

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