

The Impact of Hospital-Wide Digitalisation on Pharmacist Interventions on Discharge From ICU

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Background

- Discharging patients from ICU to the general wards involves re-prescribing of medications from the ICU Clinical Information System (CIS) to the ward medication chart. Since implementation of hospital wide electronic prescribing using a different CIS, discharges now involve re-prescribing of medications from one CIS to another. Medication transcription or re-prescribing is a known risk factor for errors.
- An audit was performed pre and post digital implementation to review whether the change of process resulted in a change in error or intervention rates or severity.

Results

	Pre-MARS	Post-MARS
Number of charts reviewed	95	182
Total number of Errors/Interventions	108	331
Errors/Interventions per chart (Average)	1.13	1.8
Errors/Interventions per chart (Range)	0-7	0-7
Errors involving PINCHA* meds	35%	37%
Major / potentially catastrophic errors.(% of total errors)	18(16%)	63(19%)
Number of charts with errors assessed as MAJOR	19%	35%

* PINCHA = Potassium/Electrolytes; Insulin; Narcotics; Cytotoxics; Heparin or anticoagulants; Antibiotics

Breakdown of errors involving High risk medications.

Errors Involving	Pre-MARS (number, % of total errors)	Post-MARS (number, % of total errors)
P - Potassium & Electrolytes	3 (2.7%)	8 (2.4%)
I - Insulin	5 (4.6%)	18 (5.4%)
N - Narcotics	9 (8.3%)	40 (12%)
C - Chemotherapeutic agents	0	2 (0.6%)
H - Heparin & anticoagulants	10 (9.2%)	21 (6.3%)
A - Antibiotics	11 (10.1%)	33 (9.9%)

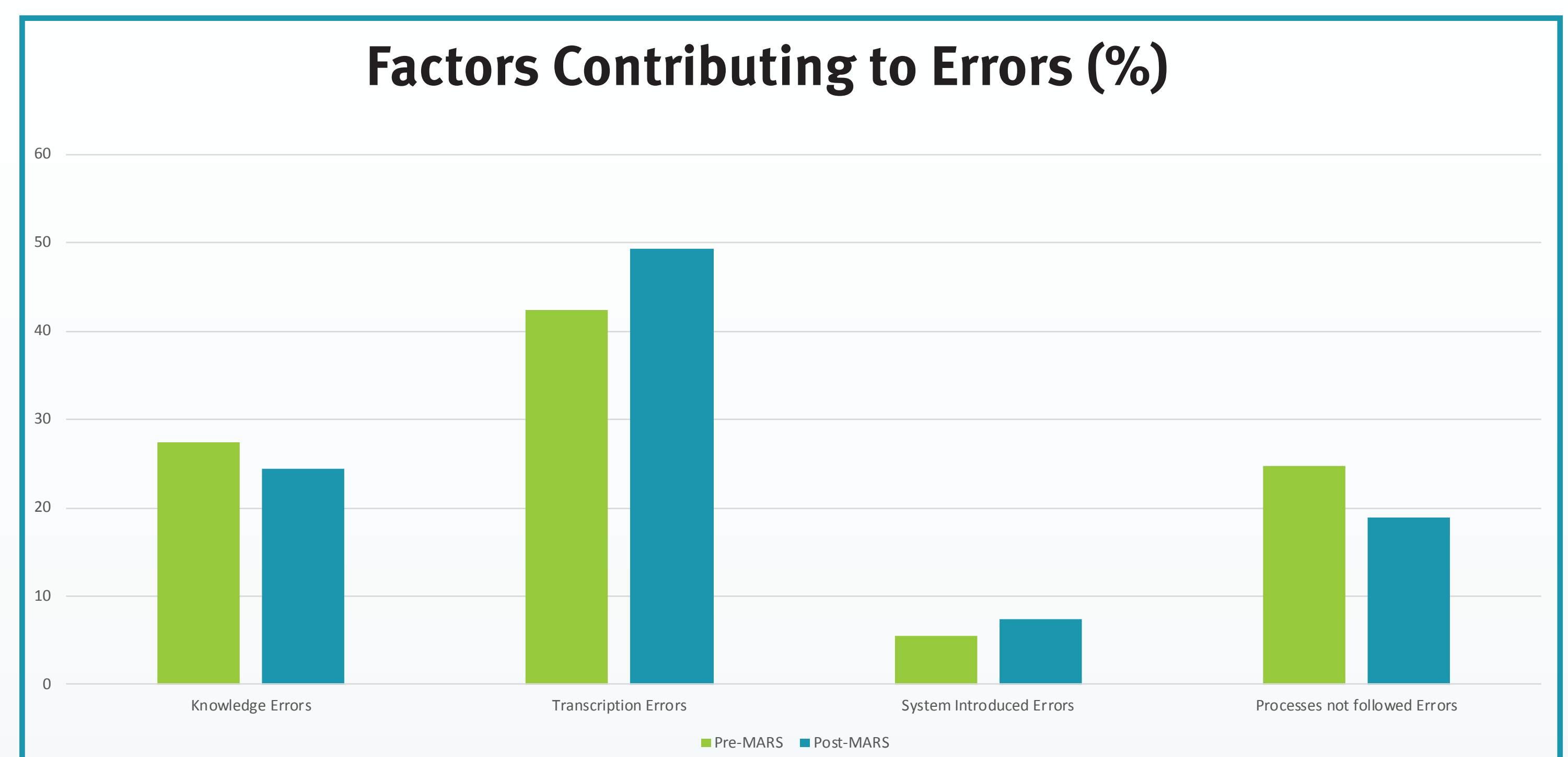
Conclusion

Implementation of a hospital wide CIS has changed the way patient discharges from ICU are processed. This has resulted in an increase in error rates and severity. Interestingly the factors contributing to errors have remained the same. Audit results are being used to modify processes, prescriber training & pharmacist staffing in order to minimise errors on ICU discharges.

Examples of Major errors detected

Scheduled	1 g	1 g	1 g	1 g	HOW
Flucloxacillin 1 g, Vial, IV, FOUR times a day (even interval), start: 13-Sep-2018 09:05:00, Indication: Endocarditis	Not given within 5 days.	Not given within 5 days.	Not given within 5 days.	Not given within 5 days.	Not given within 5 days.
heparin 5,000 unit(s), Injection, IV, ONCE only, NOW, start: 13-Sep-2018 09:05:00, stop: 13-Sep-2018 09:05:00, Indication: DVT prophylaxis					Not given within 5 days.
warfarin (Marevan) 3 mg, Tablet, Oral, evening, Indication: AF, Target INR: 2 - 3, start: 13-Sep-2018 16:00:00, stop: 14-Sep-2018 15:59:00, duration of current dose: 1 dose(s) The different brands have not been shown to ...				3 mg Not given within 5 days.	
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warfarin 1 EA, Other-enter comment, evening, start: 13-Sep-2018 15:30:00, Marevan, Indication: warfarin/INR dose check.				1 EA Not given within 5 days.	

Flucloxacillin incorrect frequency for endocarditis. Wrong route & frequency of heparin selected for DVT prophylaxis. Multiple warfarin doses prescribed for same day.



Error Types or Factors contributing to medication errors were assessed retrospectively by pharmacists. Errors were assessed as being caused by one or more of the following factors:

- Knowledge Errors** - An error caused by a lack of knowledge by the prescribing doctor. eg. When to cease ICU specific medication, or requirements for different insulin protocols on the discharge ward.
- Transcription Errors** - Medications left off or unintentionally changed in some way eg. Dose, frequency or administration times wrong.
- System Errors** - Errors introduced due to the system being used. eg. Incorrect times written on paper charts. Wrong medication order sentence selected from list on electronic prescribing system.
- Processes not followed Errors** - eg. Medication orders not ceased on admission to ICU & continued on discharge from unit when no longer appropriate. Non-ICU teams prescribing medications on the MAR whilst patients still in ICU.