The impact of pharmacist charting of intravenous medication infusions in a Medical Day Unit

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Background

A comprehensive Electronic Medical Record (EMR) was implemented at Alfred Health in Oct-2018. In the Medical Day Unit (MDU) it was identified that, following EMR implementation, workflow changes were necessary to **address the large number of EMR issues** that were delaying or complicating administration of patient infusions**. Workflow changes** were introduced in Sep-2019: pharmacists screened orders 2-weeks prior to patient attendance, live electronic tracking of IV infusion orders implemented. Following extensive consultation, in Sep-2020 governance changes allowed **pharmacist charting** of intravenous medications following medical prescribing.

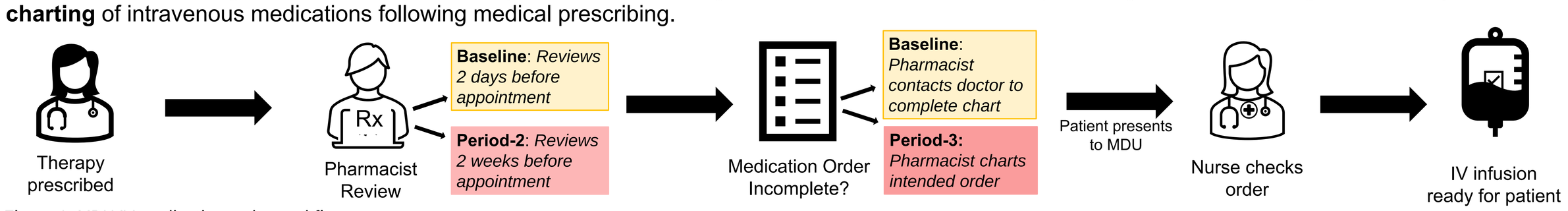

Figure 1: MDU IV medication order workflow

Aim

To evaluate the **impact of pharmacist charting of medications on length of stay (LOS)** in MDU and **the time from patient admission to IV medication** administration.

Methods

A retrospective stepped-wedge observational study evaluated the impact of the different practice-based interventions at distinct time points (see Figure 1): Baseline (Jun-Aug 2019), Period 2: Increased screening by pharmacists (Jun-Aug 2020) and Period 3: Pharmacist charting (Nov 2020 – Feb 2021).

Patient Identification:
- All patients admitted to MDU requiring IV medication administration across the 3 study periods
- Those requiring blood products or admitted under the Urology Unit were **excluded**

Data Collection
- Patient's admission time and discharge time were recorded
- Time of IV medication administration was recorded
- Pharmacist interventions were documented

Data Analysis
Outcomes included:
- o Length of stay (LOS),
- o Admission-to-medication administration time
- o Number of patients requiring pharmacist intervention

Continuous data were compared across periods using the Mann-Whitney U test

Results

The number of patient episodes, median LOS, admission-to-medication administration time and p-values comparing the timepoints are shown in Table 1, with Figure 2 demonstrating the change in times across the timepoints.

Table 1: Timepoint data

	Baseline	Period 2	Period 3
Number of patient episodes	751 (11.9 patients/day)	833 (13.4 patients/day)	1054 (15.7 patients/day)
Median LOS (mins)	195 (IQR 155-303)	132 (IQR 100-220) *p=0.0001; compared to baseline*	158 (IQR 118-261) *p=0.0001; compared to baseline*
Median admission-to-medication administration time (mins)	73 (IQR 51-99)	56 (IQR 38-78) *p=0.0001; compared to baseline*	69 (IQR 47-94) *p=0.002; compared to baseline*

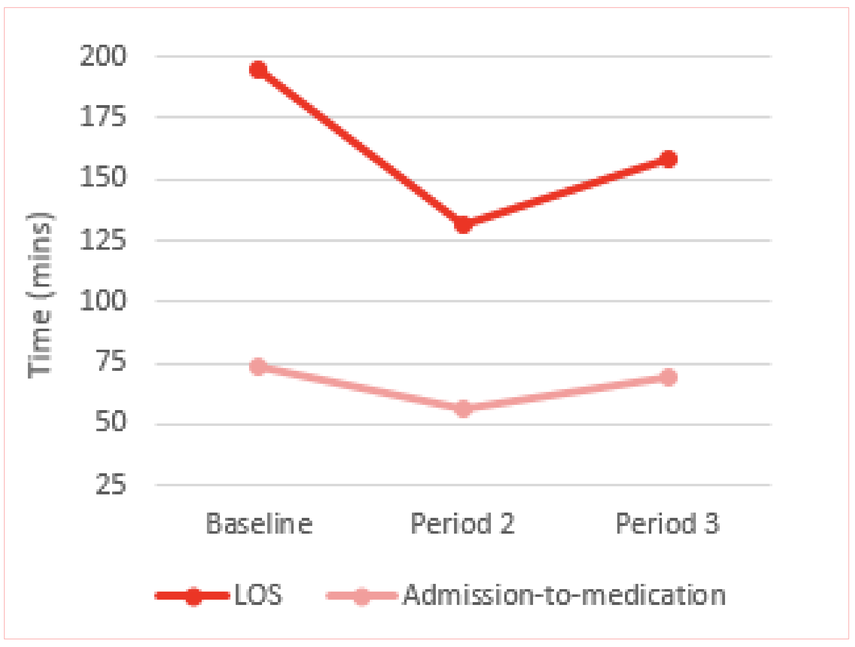

Figure 2: Length of stay and admission-to-medication administration time

Table 2: Common pharmacist interventions

Baseline (n=179 interventions)	Period 2 (n=288 interventions)	Period 3 (n=308 interventions)
1. PowerPlan Omission (25.7%)	1. PowerPlan Omission (42.4%)	1. PowerPlan Omission (38.3%)
2. Prescription Omission (22.4%)	2. Prescription Omission (33.0%)	2. Prescription Omission (31.8%)
3. Clinical Review Prompted (14.0%)	3. Medication Administration Order Omission (10.4%)	3. Rate Adjustment Required (12.7%)

There were an average of **0.24, 0.34 and 0.29 pharmacist interventions per patient episode** across the three timepoints, respectively. The most common types of intervention for each time point are shown in Table 2, with **'PowerPlan Omission' being the most common pharmacist intervention for all periods.**

Discussion

- Dedicated pharmacy services, including increased screening time and pharmacist charting contributed to **improved efficiency** of the MDU and a **sustained reduction in LOS by greater than 30 minutes**
- For **every 3 patients** admitted for IV medications in the MDU, **one patient required pharmacist intervention** to ensure timely and safe treatment
- There were also sustained **reductions in admission-to-medication administration times**. Increasing workload, changing therapeutic mix and other nursing practices will also continue to influence these important patient-related outcomes.
- Further research is required to explore the impact of workload, clinical mix and other factors on the outcomes evaluated.