TYPE: BRIEF COMMUNICATION

TITLE: Prescribing and Medication Communication on the Post Take Ward Round.

Abstract
Gaps in communication between medical officers and poor planning are associated with prescribing errors and may result in patient harm. This study describes medication communication on Post Take Ward Rounds (PTWR).
Over 6 weeks on 24 PTWRs, 130 patients, prescribed 1244 medications were observed. Of these, 811(65%) medications were discussed, with 249 discussions (relating to 126 medications) being 'in-depth'. Of 191 planned medication-related actions, 38 (20%) were not implemented by the end of the PTWR and 21 (11%) by time of discharge from hospital.
This study suggests that the level of medication communication and subsequent actions are suboptimal. Processes to improve this situation should be explored.

Funding
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KEYWORDS: Prescribing, Handover, Communication, Hospital, Ward-Round, Patient Safety

Introduction

Prescribing, a complex and challenging task, is often suboptimal in hospitals where over- and under-and inappropriate prescribing (of drugs or doses) is well recognised(1). This can result in errors and unacceptable patient outcomes including a adverse drug events (ADEs) (2).

On Post Take Ward Rounds (PTWR) junior medical officers (JMO) present each patient admitted during the previous 24 hours to the admitting unit and its consultant. During this ward round, diagnosis is often established and the treating team make decisions about investigations and treatment options, including the need for any change in medications(3, 4). The consultant is responsible for the final management decisions, whilst the JMO often implements these decisions including prescribing(5). This separation of tasks increases the risk for prescribing errors as JMOs often lack competence and confidence to prescribe appropriately(6-8).

Factors contributing to JMOs' prescribing errors include a lack of drug knowledge, inadequate supervision and communication as well as complex patient factors(7). One study identified significant gaps in the detail of conversations and inappropriate assumptions made by JMOs' regarding prescribing (5).

The details of MO communication, decisions and their actioning on the PTWR are poorly understood.

Objectives

This study aims to describe medication related communication between MOs on internal medicine PTWRs, medication decisions made and the extent to which they are implemented.
The study also investigated whether the discussions focused on medications with higher risk of harm.

Materials and Methods

Study Design

An observational, prospective, cohort study was conducted where medication related communication was observed during daily internal medical PTWRs over a 6-week period in 2014 at a quaternary teaching hospital in Brisbane, Australia. At the time of the study, a standard clinical pharmacy service was available on weekdays.

Each ward round had a single data collector (trained clinical pharmacist with nine years of hospital experience and postgraduate training) whose role was purely observational unless it was felt that an intervention was required to prevent or highlight a potential severe error. A data collection tool was developed which underwent structured review and user trials to ensure reliability and accuracy of documentation regarding prescribing and communication. The data collected was subsequently reviewed by a senior pharmacist and senior medical officer to ensure clarity around each data point collected.

Participants

All members of the eight medical teams provided informed consent to be observed.
Patients eligible for recruitment were those 16 years or older. For pragmatic reasons, observations occurred on a convenience sample of patients seen four days a week from 8am to 11am.

Data Collected

Data collected included, patient demographics, comorbidities, number of medications prescribed and time spent with each patient. All medication related discussions were recorded and classified as either a "Minimal Medication Discussion", defined as only a mention of the medication and/or the dose, route, frequency, monitoring and/or duration or an "In-depth Medication Discussion" where treatment

modification was considered. For each discussion, the level of medical officer (consultant, registrar, junior medical officer) initiating discussion, and proposing, confirming and implementing the plan were recorded. Any non-medical officers who entered PTWR discussions such as nursing staff and patients were classified as "other".

Subsequent to PTWRs, prescriptions and discharge medication record (DMR) were reviewed, looking for evidence of changes to medication that had been proposed on the PTWR.

Data Analysis

All medications were categorised as at high risk of medication related harm according to the Australian Safety & Quality Council's A-PINCH classification system (**A**ntibiotics, **P**otassium and other electrolytes, **I**nsulin and other hypoglycaemic agents, **N**arcotics and other sedatives, **C**hemotherapy and **H**eparin and other anticoagulants).(9)

Analysis was undertaken using Microsoft Excel and R (version, publisher, year). Patient demographics and other continuous data are presented as mean +/- standard deviation (normal) or as a median (range) for non-normal data. Categorical and binary data have been expressed as counts and percentages of the total number of possible outcomes. Chi-squared tests were used to compare proportions between groups (e.g. A-PINCH vs. non-A-PINCH).

Results

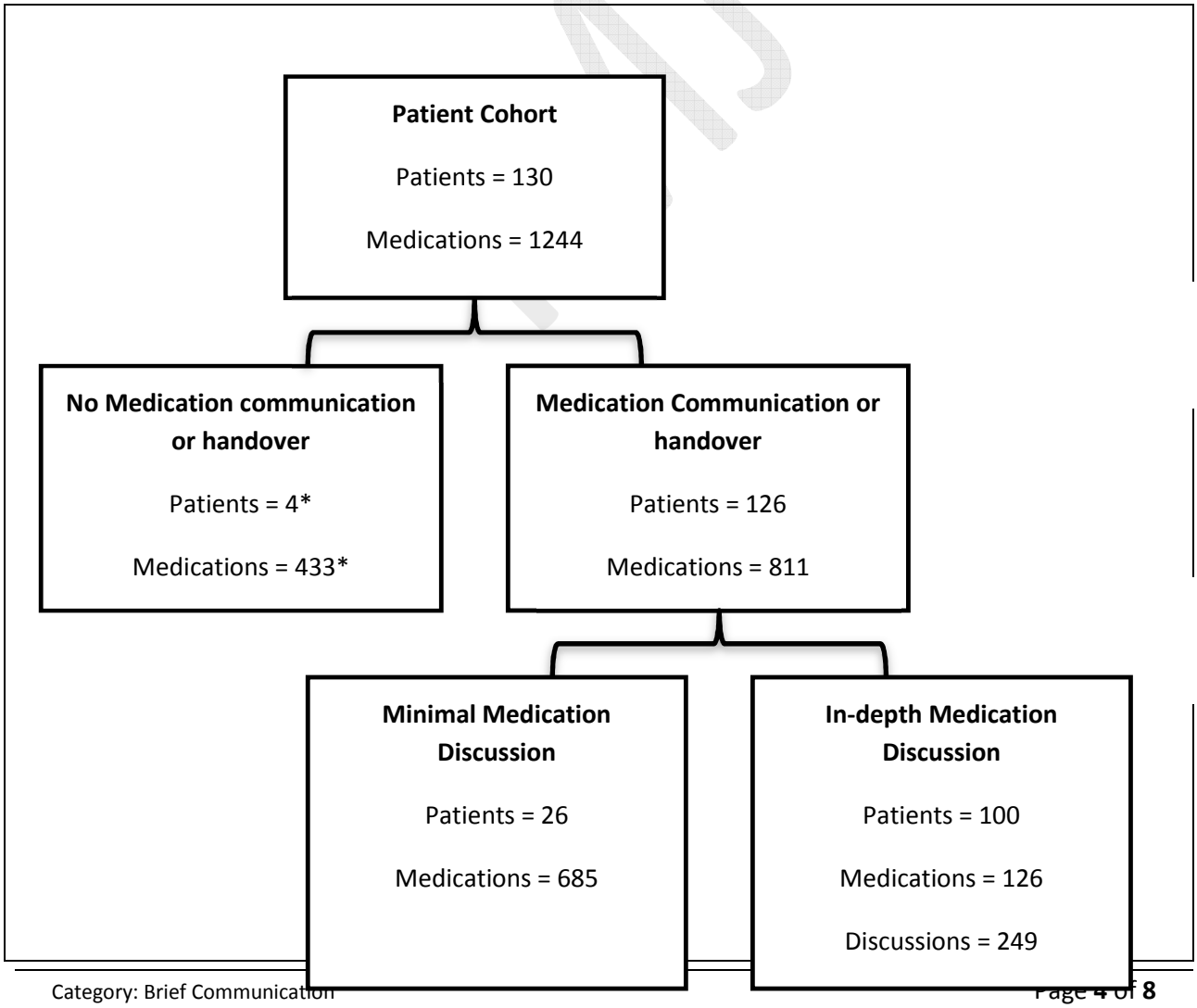

Figure One: Flowchart of the frequency of medication discussions on the PTWR.
* Nil medication communication or handover for 4 of the 130 patients and 433 of the 1244 medications across entire cohort (not limited to the 4 patients)

During the 6-week period, 24 PTWRs and 130 patient consultations were observed. Forty-one MOs were observed: 11 consultants, 11 registrars and 19 JMOs. There was an average of 4 MOs per PTWR (range 4 to 6) with a median of 3 observations per team and between 4 and 6 JMOs present on each PTWR. The mean duration of a patient review was 23 ±8 minutes (range 7 to 53 minutes).

Of the 130 patients observed, 53% were male and 58% were ≥65 years old; their mean age was 66 years (SD 19) The mean number of comorbidities per patient was 6.1 (SD 3.3). The most frequent classifications of patients using the Australian Refined Diagnosis Related Group were "Syncope and Collapse" (7), "Chest Pain" (6), and "Kidney and Urinary Tract Infection" (6).

For the 130 patient consultations observed, there were 1244 medications charted prior to, or following the PTWR, a median of 9 medications per patient (range 0 to 31). Of these, 811 (65.2%) were mentioned on the PTWR (see Figure One). A DMR was available for 80 (62%) patients and provided the final list of discharge medications. For those patients with a DMR, the median number of medications on discharge was 9 per patient (range 1 to 28).

Medication related allergies and ADRs were discussed in 48 (37%) patients and adherence in 19 (14.6%).

Table 1 shows details of the medications discussed for those with "minimal medication discussion" and the role of each MO.

Table 1: Medication details mentioned during "minimal medication discussion" (N = 811 medications)

Aspect discussed	Number Of medications	Initiated by:			
		Consultant	Registrar	JMO	Other
Medication Name	811 (100%)	90 (11.1%)	567 (69.9%)	116 (14.3%)	38 (0.5%)
Indication	171 (21.1%)	46 (26.9%)	97 (56.7%)	24 (14.0%)	4 (2.3%)
Route	27 (3.3%)	16 (59.2%)	11 (40.7%)	0	0
Dose	226 (27.9%)	43 (19.0%)	144 (63.7%)	32 (14.1%)	7 (3.1%)
Monitoring	75 (9.2%)	21 (28.0%)	48 (64.0%)	5 (6.7%)	1 (1.3%)
Duration	41 (5.1%)	9 (22.0%)	23 (56.0%)	6 (14.6%)	3 (7.3%)
Supply	6 (0.7%)	2 (33.0%)	0	3 (50.0%)	1 (16.7%)
Frequency	139 (17.1%)	26 (18.7%)	85 (61.1%)	22 (15.8%)	6 (4.3%)

Note: Number adds to more than 811 as more than one aspect of any medication may have been discussed.

Of the 1244 medications charted prior to or following the PTWR, 30% (n=374) of those mentioned were classified as "high risk", a similar proportion to those that mentioned that were not high risk (30%, n= 245).

There were 249 in-depth discussions relating to 126 medications, an average of 1.9 per patient. Of these 249 discussions, 152 (61%) were initiated by the consultant and 78 (31.7%) by the registrar. The consultant suggested resolution for 158 (63.4%) of these discussions.

Of the 249 in-depth discussions, 58 agreed changes were unable to be actioned on the PTWR, such as initiating antibiotic therapy once blood cultures were returned. Of the remaining 191 agreed actions, 153 (80%) were implemented on the PTWR whilst of the 38 (20%) other actions, only 21 (11%) were ever actioned. Of the 153 implemented, 93 (60.8%) of the recommendations were carried out by registrars and 51 (33.3%) by JMO's.

Discussion

This study has identified a number of clinical gaps in medication communication and implementation of agreed medication-related management decisions.

Importantly, less than two-thirds of all prescribed medications were even mentioned on the PTWR, with only 10% being discussed in detail. Given that there was no difference in the degree of communication dependent on the A-PINCH criteria for high risk medications, it is unlikely that it was merely the less important medications that were not discussed (e.g. aperients). This lack of in-depth discussion suggests a missed opportunity to review whether patients' medications taken prior to admission may have been associated with an ADE or have contributed to that admission.
This study suggests there is an opportunity to enhance medication communication and prescribing effectiveness on the PTWR.

Of concern, one in ten clinical decisions made on the PTWR were not implemented, with potential adverse patient outcomes. For example, it was agreed to start oral anticoagulants in one patient with atrial fibrillation who was clinically indicated for this treatment via a high CHADVSAC2 score and low HASBLED score. This did not occur during the admission and or recommended on discharge. Registrars were the most common participant to mention or handover medications on the PTWR however consultants were most likely to make treatment decisions. JMOs are often responsible for implementing decisions, but rarely discussed medications on the PTWR in this study. It is possible that JMO disengagement from these conversations has contributed to decisions not being appropriately implemented.

Of the medications discussed, rarely were indication and dose mentioned. These are important components of the medication review and reconciliation processes which if not undertaken effectively may result an adverse outcome(10). Medication related allergies and ADRs, as well as patient adherence were infrequently discussed, in spite of increasing evidence that adherence is positively linked to overall health costs (11), rate of hospitalisations(12) and health outcomes(13).

Previous studies suggest a lack of complete medication review during ward rounds which may be due to insufficient time allocated to this task(14). This would not appear to be the case in this study where an average of 23 (SD 8) minutes spent discussing medication on each patient.

Overall, our findings suggest limited consideration was given in the PTWR setting regarding when medications outcomes should be monitored, reviewed and/or stopped. This study highlights the opportunity for a system change to improve communication, prioritisation and actioning of medication related decisions in order to optimise care on the PTWR. For example, participation of a medication-focused clinician using a structured medication review tool such as the "Considerate checklist" suggested by Mohan et al in the United Kingdom, (4) or the "Medication Management Plan": an Australian Commission on Safety and Quality in Health Care initiative(15). Use of such standardised tools is intended to ensure a comprehensive patient review through recording and reconciliation of patients' medications.

Conclusions

This study extends existing knowledge on medication discussions and prescribing on PTWRs. Several areas where patient outcomes may be improved are worthy of exploration.

Ethics
Ethics approval was obtained from the Hospital and University Human Research Ethics Committees (HREC/13/QRBW/443; 2014000705). Verbal consent was obtained and recorded for all patients whose PTWR consultation was observed in this study. Written informed consent was obtained from all MOs prior to the period of observation. MO and patient consent could be withdrawn at any time.

Role of the Funding Source
This study was partly funded by a Royal Brisbane and Women's Hospital Foundation grant. The study was undertaken and reported by the researchers independent of the funder.

Contributors
All co-authors made significant contribution to the initiation and development of the study design and research goals. BM, IC, JW, PD and CM participated in the analysis, interpretation and preparation of the manuscript. All co-authors contributed to writing, editing and approval of the final paper.

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Declaration of interests
We declare no competing interests.
Ian Coombes, as Director of Pharmacy, has an interest in pharmacy staff resource utilisation.

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