

Continuity of medication management from hospital discharge to primary care in Central Australia

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Abstract

Background: Continuity of medication management can be described as the accurate transfer of medicines information across different health care settings. Pharmacists within the health care team play a primary role in ensuring that this service is being provided to patients. When a patient is admitted to hospital for treatment or care, there are often alterations made to a patient's regular and often longstanding medication regimen. Revised chronic medication regimens are typically intended to be continued after discharge from hospital in the community or primary care setting.

Aim: To identify if alterations made to a patient's medication regimen in the hospital setting reflect what is dispensed in the community/ primary care setting after discharge in rural and remote Central Australia.

Method: Retrospective chart audit. Data from inpatient records, specifically discharge medications were matched with records for the same patient with dispensing records in community pharmacies or electronic health records 4-6 weeks after discharge. Inconsistencies were noted and match rates examined.

Results: When pre-admission medications, examined from inpatient records, were compared with those recorded at discharge, 56/57 (98.2%) of patients had changes to chronic medication therapy. From the data collected 40.4% (23/57) of patients' hospital discharge prescriptions exactly matched dispensing history records in the community setting 4-6 weeks post discharge. The development of a Medication Management Plan by a clinical pharmacist did not show a significant relationship with the continuation of discharge medication care or to the provision of discharge summary (Chi-Square test: $p=0.238$, $p=0.585$ respectively). Discharge summaries were more likely to be forwarded, and recorded in a patients file, by a primary care providers if the patient received their ongoing medication from an urban or remote Aboriginal Health Service ($p=0.001$).

Conclusion: Communication and collaboration between hospital and primary health care providers needs to be improved to minimise drug related problems (DRPs) for patients in the period directly following discharge from hospital. The availability of electronic health record systems in rural and remote health settings may improve continuity of care.

Introduction

Drug related problems (DRPs) are associated with increased morbidity, mortality and increased rate of hospital re-admission. (1) When a patient is admitted to hospital for treatment or care, there are often alterations made to a patient's regular and often longstanding medication regimen. (2) Alterations may include discontinuation, initiation, reduction or titration of medication therapy and aim to provide better health outcomes for the patient. (3) Revised medication regimens are typically intended to be continued after discharge from hospital in the community or primary care setting. However, studies indicate that DRPs appear to increase and are common in the period immediately following discharge from hospital. (3-6). An Australian study of patients discharged from a hospital cardiology unit found 93.3% of patients had DRPs identified through Home Medicines Review (HMR) after discharge with a mean of 5.6 problems per patient.

Timely, accurate exchange of medication information at discharge between the acute care and primary care setting has been identified as key to optimising a patient's pharmacotherapy.(5) A lag time between information exchanges may result in increased DRPs. The literature identifies DRPs including duplication of therapy, absence of therapy or required monitoring, lack of patient information resulting in non-compliance, adverse drug reactions (ADRs), and drug interactions have resulted from a lack of continuity of care between inpatient and outpatient settings. (1)

Brand substitution commonly occurs in the hospital setting in line with hospital purchasing policy and as part of a cost minimisation strategy for the state or territory government. As a consequence patients, while provided with the same active ingredient in the same strength, are often provided with a different 'brand' of medication compared with the one they purchase from their local community pharmacy. Brand substitution has been associated with increased patient uncertainty post discharge and increases the number of DRPs that arise. Counseling patients about brand substitution, on discharge and post discharge, is an important role of both the clinical and community pharmacist and community pharmacists need to be informed of medication changes post discharge. Further, pharmacists need to be recognised as having an important role in the continuity of care cycle from the hospital to community setting. (4)

Medication Management Plans (MMP) are a nationally standardised form endorsed by the safety and quality council as an initiative aimed at reducing the potential for error at the transition between primary and secondary care.

The purpose of this study was to confirm that there is potential for error at the hospital – primary care interface in a regional centre servicing a broad area in Central Australia. Community pharmacists had observed that patients were frequently confused about the changes that had been made to medications while in hospital and that there was not always sufficient access to information for the pharmacist to assist. It was recognised that this study would not generate sufficient information to offer solutions to any problem documented but that it would inform further investigation if necessary.

Method

This research project was conducted over 5 weeks in July and August 2013 and employed a retrospective hospital chart, electronic health record and community pharmacy dispensing record audit with the aim of obtaining patients' medication profiles on admission, discharge and 4-6 weeks post discharge. The study hospital provides 7 days' supply of medicines on discharge with an option of 14 days for patients from a very remote area where supply was anticipated to be difficult. Four to six weeks was chosen for the follow up as this was thought to be the maximum period in which new or repeat prescriptions would be presented to the pharmacy. Patients might have had up to 4 weeks supply at home which they could use before presenting prescriptions for repeat and it was important to capture all initial post-discharge dispensing.

A convenience sample of participants who were on complex regular medicine regimens on admission were selected by pharmacists from discharge prescriptions presented to an Australian regional Hospital Pharmacy. For the purposes of this study, five or more chronic medications medicines intended for ongoing regular use for the treatment or prevention of chronic diseases such as diabetes, heart disease, renal disease, respiratory disease or persistent pain was defined as 'complex regular medicines' as in other studies analysing medicine use in the Australian community (7) Patients receiving renal dialysis were excluded from the study as they were admitted and discharged on the same day, three times a week, usually without changes to their medicines. Once identified, a data collection template was retrospectively completed from hospital pharmacy records and inpatient notes, describing the medications on admission and on discharge, as well as recording diagnostic conditions where available. The date of discharge was recorded, as was the date the discharge summary was sent to the primary health carer Four to six weeks after discharge, patients' ongoing medication profiles were collected from local community pharmacy dispensing records or from electronic prescribing software. The community pharmacies, where data collection took place provide prescriptions for most of the people of Central Australia including residents of remote communities.

Where no ongoing prescription(s) or dispensing was found, the patient was excluded from the study as it was not known if the patient had left Central Australia or had not yet presented for ongoing care. Patients readmitted within the study period were excluded from the study if they were readmitted before presenting for a follow up prescription.

Data from inpatient records, including pre-admission medicines as recorded on admission and those recorded upon hospital discharge and those dispensed from primary health care facilities and pharmacy providers 4-6 weeks after discharge were collected and matched.

Comparison of medication profiles between admission, discharge and 4-6 weeks post discharge and any changes to medications as part of therapy was documented. A protocol for excluding changes in therapy had been developed based on the Northern Territory Hospital Formulary Policy which states that if a patient is admitted to hospital on a non-formulary medicine, a therapeutic alternative (eg within the same class) may be used for the duration of the admission. Substitution with a therapeutic alternative e.g. ACE inhibitors, statins or proton pump inhibitors that was not expected to affect clinical outcomes for patients, were not included as a medicine change. The addition of short term medicines on discharge such as antibiotics or analgesics were not considered a change.

A Medication Management Plan (MMP) is a standardised form for reconciling pre-admission medicines, recording actions taken while an inpatient with respect to medication and is a communication tool between treating health professionals about medicines. The MMP was introduced into the study hospital shortly before the study commenced and it was also considered a quality review to collect data about the number of MMPs used in patients of the hospital having complex medication needs.

The number of discharge summaries provided by the treating doctor to primary care providers within the 7 days required before discharge meds were used was also recorded.

All discharge prescriptions meeting inclusion criteria were included consecutively from the date of commencement of the project for a period of 5 weeks in July-August 2013. This was a convenience sample with limited time available for the main data collectors for this small pilot study.

The research was approved by the Central Australian Human Research Ethics Committee.

Results

In total, 85 patient records were collected in the hospital setting, with 28 excluded from analysis. Reasons why patient records were excluded from analysis included: interstate residency (8), residency in demographic areas where ethics approval to check community pharmacy records had not been sought (4), haemodialysis patients (3), less than five chronic medications recorded (3), deceased (1) and readmitted to hospital within 4 weeks (9).

Therefore 57 patient records were retrospectively examined at discharge from hospital and 4-6 weeks post discharge in the primary care setting and subsequently included for analysis.

Of the 57 records reviewed 35 (61.4%) patients resided in the regional town (population approximately 26, 000). While, 22/57 (38.6%) of patients lived in a remote community in Central Australia.

When pre-admission medications, examined from inpatient records, were compared with those recorded at discharge, 56/57 (98.2%) of patients had changes to chronic medication therapy.

From the data collected 40.4% (23/57) of patients' hospital discharge prescriptions exactly matched dispensing history records in the community setting 4-6 weeks post discharge. This indicated continuity of medication care. Therefore 59.6% (34/57) of patients' hospital discharge prescriptions did not match dispensing history records in the community setting 4-6 weeks post discharge.

5.3% (3/57) of patients, had medications dispensed 4-6weeks after discharge which matched pre-admission records, indicating that changes made in the clinical setting were not implemented in the community or primary care setting.

Medication Management Plan and Discharge Summaries

A Medication Management Plan (MMP) was conducted by a clinical pharmacist in 28 (49.1%) patients during their hospital admission. However, this study found that the development of MMP by a clinical pharmacist did not show a significant relationship with the continuation of discharge medication care (categorised as a difference in medication dispensed at 4-6 weeks post discharge) or to the provision of discharge summary generated by the treating doctor (Chi-Square test: $p=0.238$, $p=0.585$ respectively). The results are summarised in Table 1.

	Continuation of discharged medication	
	Yes	No
MMP		
Yes	10	18
No	12	11
Unknown	1	5
Discharge summary		
Yes	11	14
No	12	18
Unknown	-	2

Continuity of medication management in remote Aboriginal communities

Patients identified in this pilot study received their continued medication supply from various pharmacies and services. , Of the patients who lived in Alice Springs, 22/35 (62.9%) had their chronic disease medications dispensed at a local community pharmacy, and 13/35 (37.1%) had their chronic disease medications dispensed at an urban Aboriginal primary health care facility with an onsite pharmacist. One third (19/57) of the total number of patient records examined resided in a remote community with an Aboriginal health care centre. Of the 23 patients whose follow up prescriptions matched their discharge prescriptions, 7 (30.4%) patients received their ongoing medication supply from community pharmacies, 7 patients (30.4%) received their ongoing medications from the urban AHS and 9 (39.1%) patients received their medication from a remote AHS. This study found no statistical significance between medication providers and the continuation of discharged medication ($p=0.253$). However, the study did identify that discharge summaries were more likely to be forwarded to primary care providers if the patient received their ongoing medication from Aboriginal Health Services ($p=0.001$).

Discussion

This study identified that 56 out of 57 patients had changes to their admission medications while in hospital as it is common for medication changes to occur for patients admitted to hospital. New medications may be initiated to treat the acute complaint, existing medications may be changed due to a change in the health status of the patient and some medications may be temporarily withheld during hospital stay. (2) It may also indicate that inappropriate or inadequate medications may have not been reviewed which may have contributed to the patient admission. From a study in 2014 conducted by Tan et al. it was found that 74% of participants had at least one change to their admission medications on discharge.(8). Another study found that older people on multiple medication had an average of 1.2 medications ceased and 2.5 added with a net increase in complexity(9). The results generated from our study shows a consistent trend with 98% of patients with changes to their regular medications on discharge

One factor that may have contributed to the high percentage of medication change could be that a Medication Management Plan (MMP) was not available for all the patients audited indicating that a best possible medication history was not available at the time of the audit, and investigators could only rely on electronic health records and progress notes to postulate the patient's admission medications

Further research is needed to confirm the high percentage of medication change. This research was a small study and did not attempt to explore whether the changes to medications in hospital were according to accepted guidelines which should also be explored in further studies.

Medication continuity errors

Moore et al (2003) examined medication continuity errors, between hospital and primary care provider medication charts, noting the absence of medications initiated in hospital that were intended for long term use post-discharge. Moore identified a 42% prevalence in medication continuity errors, study population (N=36/86). The findings from our study indicate a prevalence of 59.6% (N=23/57) in

medication continuity errors. While both studies report small sample sizes both suggest drug related problems and suboptimal quality use of medicine.

Moore concluded that timely dissemination of hospital discharge summaries to primary care physicians may decrease discontinuity medication errors. Our study suggests there was no correlation between provision of a discharge summary to the primary care provider and continuity of medications recommended at discharge from hospital. However given the small sample size, it is difficult to draw a strong conclusion and further research is needed in this area.

Medication Management Plans

A medication management plans (MMP) is a standardised form used to document and reconcile patients' medications on admission to hospital, inform of actions with respect to medicines while in hospital and to guide medication regimens on discharge. Errors of information recorded on admission have been identified in up to 67% of cases (10) and the MMP has been implemented to address this. However only about half of the complex patients in this study had a MMP completed. This study identified that conducting an MMP on admission is not correlated with continuation of intended medication changes from the clinical to community setting, although again the small sample size makes this inconclusive

Discharge summary availability

A study examining how often hospital discharge summaries were available to the patients' primary care physician post hospital discharge, identified that only 8.2% (N = 792) of primary care physicians were provided with a hospital discharge summary in time for their first follow up consult (11). Forster et al (12) identified that following hospital discharge the majority of medication adverse events were a consequence of poor communication between the hospital team and the primary care provider and could have been prevented or ameliorated.

During the audit, it was found that 34 (59.6%) of hospital discharge summaries did not reach the primary care provider within 4 weeks of discharge. On discharge, patients are usually supplied one to two weeks of discharge medications from the hospital pharmacy, depending on the remoteness of the patient's home. This allows time for patients to see their primary health care providers, update their prescription and obtain further supplies of their medications from the community pharmacy or health clinic. However, if discharge summaries are not sent before the patient presents for follow up, it is difficult for the primary health care providers to know if there were any changes to their patient's regular medications and the reasons for these changes, leading potentially to changes to medications during hospital stay not followed up promptly and patients being put back onto the same medications they were taking prior to hospital admission.

The study identified that discharge summaries were more likely to be forwarded to primary health care providers if the patient received ongoing care from an urban or remote AHS. A study by Kirby et al (13), highlights the benefits of an electronic discharge summary system by comparing the time it took for discharge summaries to be sent to general practitioners using both the conventional and electronic systems. According to the results of the study, the mean time taken to produce an electronic discharge summary for patients with similar demographics was immediate (0 days).(13) This was significantly ($P < 0.0001$) lower than mean time of 80 days taken to produce a conventional discharge summary.(13). The use of electronic discharge summaries are possible reasons to explain why discharge summaries were more likely to be sent to urban and rural AHS compared to the community pharmacies, although this also is worthy of further investigation

Continuity of medication management in remote aboriginal communities

With the implementation in 1997 of Section 100 arrangements in remote AHS, access to medications for remote indigenous patients is no longer an issue, but whether these medications are being used appropriately remains a controversial subject. Although medicines for chronic conditions are prescribed by a doctor, medical staff turnover is high and medical review is often by phone. Medicines may not be regularly reviewed by a pharmacist on dispensing if they are supplied by nursing staff or if dispensed remotely and dispatched by freight, there is no opportunity for the pharmacist to identify DRPs on counseling on continued dispensing as there is in an urban pharmacy. At the time of the

study, pharmacist medication review services such as Home Medicines Reviews and MedsChecks were not available to patients in remote Aboriginal communities. It may be that if these services are available in remote areas, especially after recent discharge from hospital, the potential for DRPs at the interface between hospital and community care may be ameliorated. On the other hand, it would appear that where there are pharmacists to investigate medication discrepancies, i.e. in the urban setting, the information from discharge summaries that might assist this is less likely to be received. More research is needed in how to enhance continuity of care and in particular the role of the pharmacist to reduce the potential risk of post-discharge DRPs.

Limitations

There are several limitations in this study. Firstly, we cannot assume if medications dispensed in the community setting do not exactly match those medications that were dispensed at discharge that continuity of care has not been achieved. Patients may have a stockpile of medications at home and therefore did not need to have medications dispensed in the community setting. Some patients may have collected their medications prior to the community pharmacy being provided with the patients updated discharge prescription.

The study was a small study and focused on whether there were changes to long term medicines while in hospital and whether medicines dispensed 4-6 weeks post-discharge matched the discharge prescription. An exploration of the reasons for this or whether GPs had made a conscious decision not to follow the advice of the hospital doctor was beyond the resources of the researchers. Such an exploration would appear to be a logical next step. Consequently, it is not possible to make recommendations for improving the continuity of medication management without the root cause analysis further research would provide.

Conclusion

Optimising patient health outcomes requires communication and collaboration between the hospital team and primary health care providers to minimise DRPs for patients in the period directly following discharge. This retrospective hospital medication chart and community dispensing record audit identified that continuity of care between the clinical and community setting is suboptimal, and especially in comparison with similar studies in the area of continuity of care. More needs to be done in this area to optimise health outcomes for patients. Improved access to pharmacists and medication management services as well as electronic health records may improve the quality use of medicines.

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