

Partnered pharmacist medication charting and prescribing in Australian hospitals

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SUMMARY

Medication charting and prescribing errors commonly occur at hospital admission and discharge. Pharmacist medication reconciliation, after medicines are ordered by a medical officer, can identify and resolve errors, but this often occurs after the errors have reached the patient.

Partnered pharmacist medication charting and prescribing are interprofessional, collaborative models that are designed to prevent medication errors before they occur, by involving pharmacists directly in charting and prescribing processes.

In the partnered charting model, a pharmacist and medical officer discuss the patient's current medical and medication-related problems and agree on a medication management plan. Agreed medicines are then charted by the pharmacist on the inpatient medication chart. A similar collaborative model can be used at other points in the patient journey, including at discharge.

Studies conducted at multiple Australian health services, including rural and regional hospitals, have shown that partnered charting on admission, and partnered prescribing at discharge, significantly reduces the number of medication errors and shortens patients' length of stay in hospital. Junior medical officers report benefiting from enhanced interprofessional learning and reduced workload.

Partnered pharmacist medication charting and prescribing models have the best prospect of success in environments with a strong culture of interprofessional collaboration and clinical governance, and a sufficiently resourced clinical pharmacist workforce.

Introduction

Medication errors are among the most common incidents reported in hospitals, especially at admission and discharge.^{1,2} Medication reconciliation and review by a hospital pharmacist is effective for identifying and resolving errors on medication charts and discharge prescriptions.^{2,3} Traditionally this process occurs after medicines have been ordered by a medical officer, which means errors are fixed retrospectively, sometimes after errors have reached the patient and caused an adverse drug event.⁴ Adverse drug events in hospitals are associated with increased length of stay and higher costs.^{5–7}

Partnered pharmacist medication charting and prescribing are interprofessional, collaborative models of care that are designed to prevent medication errors before they occur, by involving pharmacists directly in charting and prescribing medicines. These models have been evaluated over the last 15 years,^{8–10} and are being implemented at hospitals across Australia.

Partnered medication charting on admission

In the partnered pharmacist medication charting model, a pharmacist interviews the patient to obtain a comprehensive, verified medication history and

identify medication-related issues. The pharmacist then collaborates with the medical team to develop a medication management plan, and charts the agreed medicines. This is followed by a discussion between the pharmacist and the treating nurse about the plan, including any urgent medicines to be administered and medication-related monitoring (Figure 1). Depending on the jurisdiction's regulations and local health service policies, pharmacist-charted orders may need to be co-signed by a hospital medical officer or another licensed prescriber.

The patient, and their carer where applicable, is included in decision-making during the partnered charting process, and informed about their medication plan and reasons for changes to their medicines.

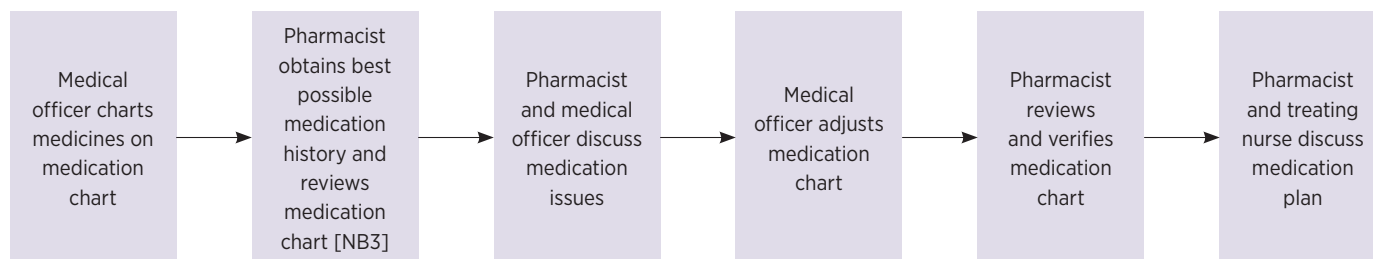
The partnered pharmacist charting model is evolving, and in some centres it is utilised both on admission and during interprofessional ward rounds.

Partnered prescribing on discharge

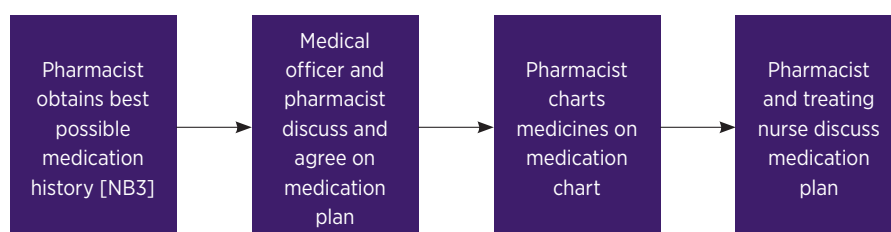
A similar collaborative model has also been applied to the preparation of discharge prescriptions. In the partnered pharmacist prescribing on discharge model, the pharmacist prepares patients' discharge prescriptions, which are reviewed and co-signed by a medical officer. Before preparing the discharge

Figure 1 Comparison of steps in the standard medical charting and partnered pharmacist medication charting models [NB1][NB2]

Standard medical charting model



Partnered pharmacist medication charting model



NB1: These flow charts summarise medication-related processes only. In the partnered charting models there is no change to other medical officer tasks, such as gathering past medical history (which usually identifies some medicines) and undertaking clinical assessment and diagnosis.

NB2: In both models, the patient, and their carer where applicable, is included in decision-making and informed about their medication plan and changes to their medicines.

NB3: A best possible medication history (BPMH) is a comprehensive history of all medicines used by the patient, including non-prescription and complementary medicines, collated and verified using more than one source. A BPMH that involves the patient or carer provides the best assessment of the medicines a patient takes at home. It is the cornerstone of medication reconciliation and informs decisions about the medication plan.¹¹

orders, the pharmacist reviews the patient's pre-admission and inpatient medicines and clinical record, interviews the patient, and collaborates with a medical officer to determine the patient's discharge medicines.

Effectiveness and safety of partnered charting and prescribing

A cluster randomised controlled trial comparing partnered pharmacist medication charting to standard medical charting for patients admitted to general medicine units at a large metropolitan teaching hospital in Victoria was undertaken in 2015.¹² The primary outcome was a medication error within 24 hours of admission, identified by an independent assessor who was not part of the patient's admission process. Of the 473 patients who received standard medical charting, 372 (78.7%) had at least one medication error identified, compared with 15 out of 408 patients (3.7%) in the partnered charting arm ($p < 0.001$). The relative risk of an error with standard medical charting compared with partnered charting was 21.4 (95% confidence interval [CI] 13.0 to 35.0). There were 175 high or extreme risk errors in the standard charting group, compared with just one in the partnered charting

group, with a number needed to treat to prevent one high or extreme risk error of 2.7 (95% CI 2.4 to 3.1).¹²

To evaluate replicability of the partnered pharmacist charting model at other health services, evaluations were undertaken in general medicine units at 7 metropolitan and 13 regional and rural public health services in Victoria ($n = 8648$ and 1344 patients, respectively).^{13,14} In both studies, partnered pharmacist charting was associated with significant reductions in the proportion of patients with at least one medication error on admission (from 65.9% and 66.7%, respectively with standard medical charting, to 3.6% and 9.5%, respectively with partnered charting). Median length of stay in hospital was shorter in the partnered charting group compared to standard charting in both studies (4.2 versus 4.7 days at metropolitan hospitals, and 3.7 versus 4.8 days in regional and rural hospitals; $p < 0.001$).^{13,14}

An independent economic evaluation, using data from the partnered pharmacist charting study at 7 metropolitan hospitals in Victoria, estimated an average saving of \$726 per patient and a cost-benefit ratio of approximately 1:15.¹⁵

Partnered pharmacist charting on admission has also been evaluated in emergency departments, haematology and oncology units, surgical units and pre-admission clinics, with similar reductions in medication errors observed when compared with standard medical charting.^{4,16-20} In a study conducted in the orthopaedic units of a large metropolitan public hospital, partnered pharmacist charting also improved prescribing of venous thromboembolism prophylaxis.⁴

Partnered pharmacist prescribing on discharge has been evaluated in several Australian studies conducted in general medicine, surgery, aged care and renal medicine units. Outcomes have included significantly fewer discharge prescription errors,^{10,21-24} reduced postoperative opioid prescribing,²⁵ more accurate discharge summaries,²⁴ and earlier ward discharge (57 to 110 minutes earlier), compared with standard medical discharge prescribing.^{10,21,22}

Impact on junior doctors

Concerns have been raised about the potential for partnered pharmacist charting and prescribing to de-skill junior medical officers (JMOs), by reducing the amount of prescribing that they undertake during hospital training. On the other hand, structured and clinically relevant discussions with a pharmacist in a team environment results in enhanced on-the-job learning.

Partnered charting and prescribing is undertaken at the discretion of the clinicians involved, and only when the pharmacist is available. Therefore, some patients continue to receive standard medical charting and prescribing, thus providing opportunities for JMOs to prepare medication charts and discharge prescriptions independently.

The model has positive effects on JMOs' workloads by avoiding the need for them to prepare medication charts and discharge prescriptions for every patient under their care, and to go back and correct errors that are identified later, often when they have left the location the patient is in.

At a health service where partnered pharmacist prescribing on discharge was evaluated in surgery and medicine units, only 10 to 22% of JMOs who were involved in the trials were concerned about potential for de-skilling, and 100% of JMOs wanted the partnered model to continue.^{21,22} At the same health service, in-depth interviews were conducted with orthopaedic unit JMOs and nurses, following a 3-month trial of partnered charting on admission and partnered prescribing on discharge. The JMOs and nurses reported benefits on patient safety, patient flow and JMO workload, and said that these

outweighed the potential for de-skilling JMOs. JMOs felt that having focused conversations with pharmacists about medicines that were being prescribed provided learning opportunities.²⁶

It is possible that medical officers who are exposed to collaborative charting and prescribing models in the early phase of their working lives will acquire knowledge on quality use of medicines at a faster rate than medical officers who prescribe largely in isolation from the pharmacist.

Credentialing of pharmacists for partnered charting and prescribing

As part of the development of these models, pharmacist training and credentialing programs have been developed with extensive physician involvement.^{8,9,27} These are designed to ensure that pharmacists undertaking the role are competent to chart and prescribe medication safely within a collaborative interprofessional framework.

Not all hospitals may have the resources and capability to implement their own credentialing program and credential their own pharmacists, for example smaller pharmacy departments in regional and rural areas. Therefore a national credentialing program for partnered pharmacist medication charting in hospitals has recently been implemented by The Society of Hospital Pharmacists of Australia, in partnership with Alfred Health, to assist with further expansion of this model.²⁸

Implementation issues and future directions

A sufficiently resourced clinical pharmacy service is required for implementation of partnered medication charting and prescribing. Patients are admitted to hospital at all hours of the day, so consideration should be given to extending clinical pharmacy services beyond traditional pharmacy hours, and potentially up to 24 hours a day, 7 days a week.

The models have the best prospect of success in environments that have an existing strong culture of interprofessional collaboration and clinical governance. All of the evaluation studies have been done in public hospitals. The models could potentially be beneficial in other settings, such as private hospitals and residential aged-care facilities, but evaluation in these settings has not yet been undertaken. There are additional complexities in private hospitals and aged care, where medication charts may be used not only for the purpose of medication administration, but also as a Pharmaceutical Benefits Scheme prescription.

Conclusion

Partnered pharmacist medication charting and prescribing are interprofessional, collaborative models of care, where a pharmacist charts or prescribes medicines in collaboration with a hospital medical officer. This approach has been demonstrated to significantly reduce the rate of medication errors at admission and discharge, with additional benefits including earlier discharge and reduced medical officer workload. ◀

Conflicts of interest: Erica Tong's employer (Alfred Health) received funding from the Victorian Government Department of Health and Safer Care Victoria to support implementation and evaluation of the partnered pharmacist medication charting model at multiple health services across Victoria.

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