

The importance of medication reconciliation for patients and practitioners

SUMMARY

Medication errors are common and often occur when patients move between healthcare settings.

Around half of hospital medication errors occur on admission, transfer and discharge. Around 30% of these have the potential to cause patient harm.

Advanced age and taking several prescription medicines are associated with an increased risk of medication errors on admission.

At least one in six patients may have a clinically significant medication discrepancy on transfer within a hospital. Discrepancies also often occur at discharge and may cause problems in general practice.

The process of medication reconciliation can significantly decrease errors. It involves obtaining, verifying and documenting a list of the patient's current medicines and comparing this list to the medication orders and the patient's condition to identify and resolve any discrepancies.

Medication reconciliation is an important element of patient safety.

Introduction

A common patient safety problem around the world is the lack of accurate and complete information about patients' medicines when their care is transferred between healthcare settings. In up to two-thirds of patients there are variances between the medicines they take at home and the medicines ordered on admission to hospital.¹ It has been estimated that around half of the medication errors that happen in hospital occur on admission or discharge from a clinical unit or hospital.² Around 30% of these errors have the potential to cause patient harm.^{3,4} These errors are also an economic burden to health services.⁵

The problem is not confined to hospital. Patients may have several specialist prescribers as well as their general practitioner. If there is not good communication between all the prescribers there is potential for medication errors. Studies in ambulatory

care settings report 26–87% of medication records as incomplete or having discrepancies between medicines taken by the patient and those documented in the patient record.⁶ In an Australian study only 58% of general practitioners' referrals to a specialist contained the correct dosage and number of prescribed medicines. Complementary and over-the-counter medicines were documented in 26% of letters.⁷

Causes of medication errors at interfaces of care

Errors can occur:

- on admission when determining the medicines the patient is currently taking
- when recording details of the patient's medicines in the medical record
- when prescribing medicines for the patient after admission, on transfer to another ward and at discharge.⁵

Drug history on admission

Drug histories are often incomplete with strengths, dose and drug forms missing (see case 1) and non-prescribed medicines, such as over-the-counter or complementary medicines, often omitted. Studies have shown that 10–67% of medication histories contain at least one error.¹

In hospital the history is used to inform the inpatient medication orders, to make treatment decisions and to identify adverse medicines events. If errors are not corrected they continue throughout the patient's stay. Incomplete medication histories at the time of admission have been cited as the cause of at least 27% of prescribing errors.⁸ The most common error is the omission of a regularly used medicine.^{4,9,10}

Erroneous drug histories can lead to discontinuity of therapy, recommencement of ceased medicines, inappropriate therapy and failure to detect a drug-related problem. These errors can have adverse consequences for the patient during their hospital stay. Perpetuation of these errors on discharge may result in adverse events, from duplication of therapy, drug interactions and discontinuation of an essential medicine (see case 2).

Recording medicines on admission

The current processes for recording drug histories have been described as inadequate, potentially

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dangerous and in need of improvement.⁴ These histories may be obtained by a number of different practitioners with varying skills and recorded on different forms and in different places in the medical record. In some cases the only history recorded is the medicines ordered on the inpatient medication chart.

Prescribing medicines on admission, transfer and discharge

Errors can be introduced into a patient's medication regimen whenever there is a transfer of care, particularly on:

- admission to hospital
- transfer from the emergency department to other wards, or the intensive care unit
- transfer from intensive care unit or operating theatre to the ward
- transfer from hospital to home or another facility, such as a residential aged-care facility.

Discrepancies commonly occur between the drugs a patient is taking on admission and those ordered on the medication chart. Literature reviews report unintentional discrepancies of 30–70% between the medicines patients were taking before admission and

their prescriptions on admission.⁵ In a recent study, 26.6% of these discrepancies were attributable to inadequate or incorrect information in primary care medicines lists including general practitioner referrals and printouts of medicines.¹¹

Patients over the age of 65 years and those taking several prescription medicines have a significantly increased risk of medication errors.¹² Internal hospital transfer of care also carries considerable risks. At least one in six patients have one or more clinically significant medication discrepancies on transfer, for example when a patient is transferred from intensive care to a general ward.^{13–15} Patients at high risk for these discrepancies include those for whom a comprehensive medication history has not been taken by the time of transfer, those with a greater number of medicines taken before admission, and those prescribed multiple medicines at the time of transfer.¹⁴ Omission of a medicine with a valid indication is the most common unintentional discrepancy¹⁴ and around half of these errors may not be detected before they affect the patient.¹⁵

Discrepancies also commonly occur at discharge when prescriptions are written and discharge summaries prepared. One Australian study has reported 15% of drugs intended to be continued were omitted on the discharge prescription.¹⁶ Another found 12% of patients had one or more errors in their discharge prescription, including unintentional omissions and continuation of drugs which had been ceased.¹⁷ Patients with one or more drugs omitted from their discharge summary have 2.31 times the usual risk of re-admission to hospital.¹⁸

What is medication reconciliation?

Medication reconciliation is a process designed to improve communication and promote teamwork. This has the objectives of preventing medication errors associated with the handover of care¹⁹ and maintaining continuity of care. It is described as the formal process of obtaining, verifying and documenting an accurate list of a patient's current medicines on admission and comparing this list to the admission, transfer and discharge orders, to identify and resolve discrepancies.^{13,20,21} At the end of each episode of care the verified information is transferred to the next care provider and provided to the patient or carer.²¹ This information includes changes made to the medicines during the episode of care. There are a number of discrete steps (Fig. 1). The process is based on the safety principle of independent redundancies – having independent checks, generally by different providers, for key steps in the process.¹³ The process aligns with the principles recommended to achieve continuity of medication management in Australia.²²

Consequences of medication errors

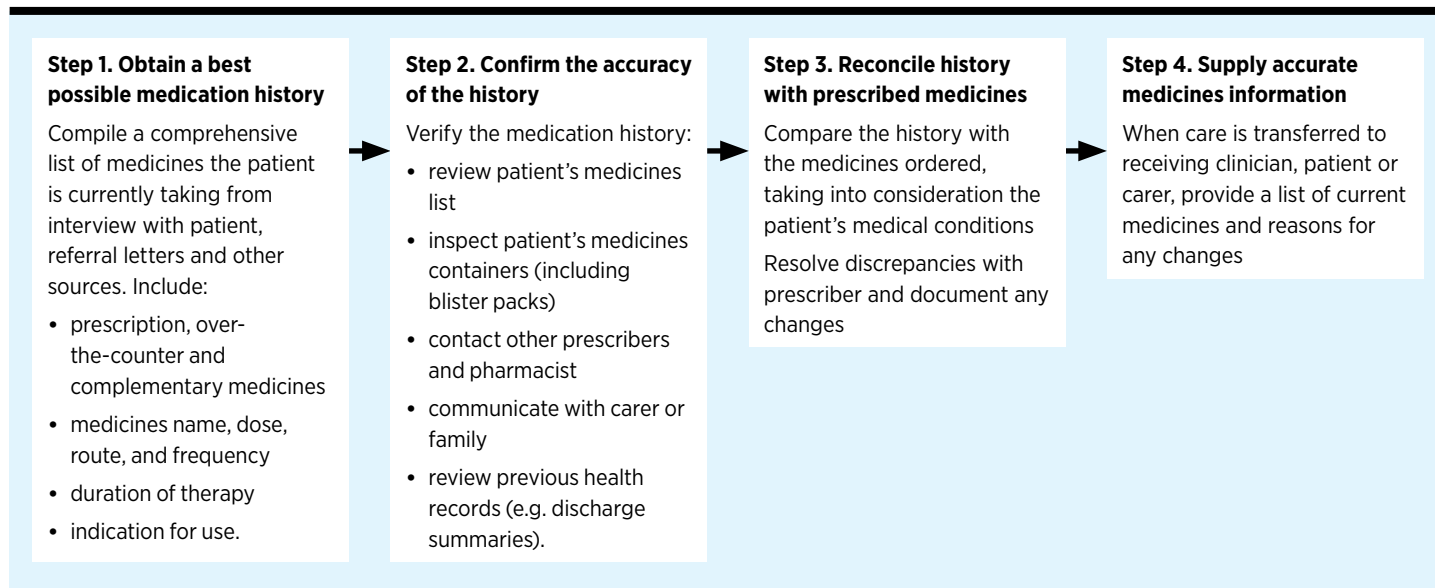
Case 1

A 67-year-old woman with a regular general practitioner was prescribed several medications, including atenolol 50 mg daily, after a myocardial infarction. Six months later she saw a cardiologist for a review of her treatment. She was asymptomatic, but the cardiologist prescribed metoprolol 50 mg twice daily. The cardiologist did not have a complete list of her medicines. As she was now taking two beta blockers, the patient subsequently developed symptomatic bradycardia.

Case 2

An elderly man was admitted to hospital via the emergency department. The patient had recently started warfarin for atrial fibrillation so his INR was measured. The INR was 4.0 and the decision to 'withhold warfarin until INR is therapeutic' was documented in the patient's notes. No warfarin was ordered during the admission. The discharge prescription and summary were written from the inpatient medication chart so did not include warfarin. There was no reconciliation with the admission history. A medicines list for the patient was prepared by hospital pharmacy staff from the discharge prescription and placed in the bag with a month's supply of discharge medicines. No follow-up appointment was made with the general practitioner. Five days later the patient suffered a stroke.

Fig. 1 Steps in the medication reconciliation process on hospital admission



The best possible medication history

A 'best possible medication history' is the cornerstone of the medication reconciliation process. It is described as a comprehensive drug history obtained by a clinician that includes a thorough history of all regular medicines used, including non-prescription and complementary medicines, and is verified by more than one source. A structured process for taking the history, that involves the patient or carer or family, using a checklist to guide the interview, and that verifies the history with information from a number of different sources, provides the best assessment of the drugs a patient takes at home.⁴

Sources used to obtain a comprehensive history are listed in Fig. 1 (step 2). Patients being admitted to hospital should be advised to take their medicines containers and current medicines list.

Ideally the best possible medication history is completed before any drugs are ordered and is used when the medication chart is written up. For unplanned admissions the history is usually completed after the initial medication orders have been written and is used to reconcile the orders.

In the community the general practitioner can refer to the community pharmacy for a list of dispensed medicines or request a Home Medicines Review to determine the medicines currently taken. This best possible medication history should be reconciled with the current medication list in the patient's record and their condition.

Standardised reconciling form

A standardised form for recording the best possible medication history and reconciling any discrepancies

is essential for effective medication reconciliation. Whether electronic or paper based, the form should be kept in a consistent, highly visible position in the patient's notes and be easily accessible by all clinicians when writing medication orders and reviewing the patient.¹⁹

In Australia the National Medication Management Plan* can be used to record the history and reconcile medication orders in patients admitted to hospital.

Electronic solutions

Computerised systems (e-prescribing) may prevent many of the medication errors that occur at transfers of care but these systems are not without their problems. They still require someone to enter an accurate list of drugs and allergies. Medication lists in electronic records can lag behind prescription changes and be incomplete.¹² For example, they may only contain the medicines prescribed in a particular system, and not include non-prescription products or medicines prescribed by other practitioners. Outdated, unverified or inaccurate information may be transferred indefinitely when using copy-and-paste facilities, so reconciliation is still required.¹³

Reconciling medicines

Medicines should be reconciled as soon as possible,⁵ at least within 24 hours of a patient's admission to hospital or earlier for high risk drugs.¹⁹ This involves a clinician comparing the history against the medication orders at admission, transfer or discharge to identify any variances and bring them to the attention of the

* www.safetyandquality.gov.au/internet/safety/publishing.nsf/Content/PriorityProgram-06_MedRecon

prescriber, taking into consideration the patient's clinical condition. Any changes to orders are documented. Whoever performs the task should be trained and competent in the process.

In the community, medication reconciliation should occur on receipt of information about the discharge medication. The general practitioner can compare the medication history in the patient's notes with the discharge medicines list provided by the hospital, reconciling any differences and updating the patient's record. Similarly when changes are made to a patient's medicines such as dosage alterations, medicines ceased or new medicines prescribed, the current medication list in the patient's record should be reviewed and updated. This reduces the risk of inaccurate medication information being transferred to other care providers in referrals. Providing patients or carers with an updated list when medicines are changed and encouraging them to maintain their own medicines list is an important component of the medication reconciliation process. A medicines list is available from NPS.*

Involving patients in medication reconciliation

Engaging the patient is one of the best strategies to prevent reconciliation errors and a patient-centred approach to medication reconciliation is recommended. When patients present a list of their medicines, or the medicines themselves, on admission to hospital the risk of medication errors and harm is reduced.¹² Any discrepancies should be discussed with the patient, and enquiries made about medicines prescribed by other prescribers and any over-the-counter or complementary medicines they are taking.

Evidence for effectiveness of medication reconciliation

Individual hospital studies and a number of large-scale initiatives in the USA and Canada have shown that medication reconciliation significantly reduces medication errors and adverse events. Errors

* www.nps.org.au/consumers/tools_and_tips/medicines_list (also available as a mobile phone application)

prevented by medication reconciliation include inadvertent omission of therapy, prescribing a previously ceased medicine, the wrong drug, dose or frequency, failure to recommence withheld medicines and duplication of therapy after discharge. Implementing formalised medication reconciliation at admission, transfer and discharge reduces medication errors by 50–94%^{3,13,15,20} and reduces those with the potential to cause harm by over 50%.^{3,23} The process is also associated with improved patient outcomes and a tendency for reduced readmissions.¹⁸

Efficiency

A standardised process for medication reconciliation reduces the work associated with the management of medication orders. Time savings for nurses of 20 minutes per patient at admission and pharmacists of 40 minutes per patient at discharge have been reported.²⁰

Recognising the importance of medication reconciliation

A formalised system of medication reconciliation could have prevented the events described in the cases. In case 2 if the doctor's plan to recommence the warfarin had been documented in the patient's medication management plan, the error would have been identified if the plan had been used to reconcile the drugs ordered on discharge.

Conclusion

The process of medication reconciliation, using a formalised structured approach involving patients and carers and conducted in an environment of shared accountability, can reduce the morbidity and mortality of medication errors that occur at interfaces of care. Medication reconciliation is a cost-effective use of the health dollar and an important element of patient safety. ◀

Conflict of interest: none declared

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SELF-TEST QUESTIONS

True or false?

1. Patients who have one or more medicines omitted from their discharge prescription are twice as likely to be readmitted to hospital.
2. At least 27% of prescribing errors result from a failure to take a complete medication history.

Answers on page 35

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