AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

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High 5s Project
Assuring Medication Accuracy at Transitions of Care
Australian Interim Report
January 2010 – March 2013

MATCH UP medicines

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The Commission also wishes to thank the members of the Commission's Medication Continuity Expert Advisory Group for their advice on the conduct of the project.

This work was carried out as part of the High 5s Project set up by the World Health Organization (WHO) in 2007 and coordinated globally by the WHO Collaborating Centre for Patient Safety and the Joint Commission in the United States of America, with the participation of the following Lead Technical Agencies:

1. Australian Commission on Safety and Quality in Health Care, Australia
2. Canadian Patient Safety Institute, Canada and the Institute for Safe Medication Practices Canada, Canada
3. National Authority for Health–HAS, France with CEPPRAL (Coordination pour L'Evaluation des practiques professionelles en santé en Rhône–Alpes), France, OMEDIT Aquitaine (Observatoire du Medicament, Dispositifs medicaux et Innovation Therapeutique), France (from 2011–2015) and EVALOR (EVAluation LORraine), France (from 2009 –2011)
4. German Agency for Quality in Medicine, Germany and the German Coalition for Patient Safety, Germany
5. CBO Dutch Institute for Healthcare Improvement, the Netherlands
6. Singapore Ministry of Health, Singapore
7. Trinidad and Tobago Ministry of Health, Trinidad & Tobago
8. former National Patient Safety Agency, United Kingdom of Great Britain and Northern Ireland
9. Agency for Healthcare Research and Quality, USA.

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Contents

Acronyms and abbreviations

BPMH	'best possible medication history'
the Commission	Australian Commission on Safety and Quality in Health Care
ED	emergency department
MAP	Medication Action Plan
MMP	Medication Management Plan
NSQHS	National Safety and Quality Health Service
SOP	standard operating protocol
WHO	World Health Organisation

1. Executive summary

The Australian Commission on Safety and Quality in Health Care (the Commission) is the lead technical agency for the High 5s Project in Australia. Seven countries are participating in the project, which is being conducted under the auspices of the World Health Organisation (WHO).[a] Australia is one of four countries implementing the patient safety solution – Assuring Medication Accuracy at Transitions of Care.

The High 5s Project Assuring Medication Accuracy at Transitions of Care – Australian Interim Report January 2010 – March 2013 summarises the results of the Australian arm of the project between these dates. Further information is available in the WHO's *The High 5s Project Interim Report, 2014*.[b]

Objectives

The objectives of the project were to determine whether:

- it was feasible to implement a standard operating protocol (SOP) in different countries with different healthcare environments and cultures
- the SOP was effective in improving patient safety.

Approach

The five-year project commenced in January 2010 with the recruitment of 18 healthcare services. At the time of writing this report, 13 health services were continuing in the project.

Health services were required to implement the SOP using quality improvement methodology, evaluate improvements and spread the medication reconciliation process to all eligible patients (those 65 years and older admitted to hospital via an emergency department) in all locations of the health service.

The SOP required health services to implement a formal process for reconciling medicines within 24 hours of admission. The process was to be multidisciplinary and involve patients and carers.

A multi-faceted evaluation strategy was used. Information was collected on health service implementation experiences, the quantity and quality of medication reconciliation performed, and possible SOP-related adverse events.

Results

The project demonstrated that it was feasible to implement the High 5s Assuring Medication Accuracy at Transitions of Care SOP (Medication Reconciliation SOP) in Australian health services. However, the process was pharmacy led, and the extent of implementation of the SOP was largely dependent on available clinical pharmacy resources.

The aggregate rate for eligible patients having their medicines reconciled within 24 hours of admission was stable at around 50% throughout the period. The rate varied amongst the health services from 9–98%. Only one health service reported a majority (over 80%) of their eligible patients having their medicines reconciled in the 24-hour timeframe.

The SOP was effective in minimising potential medication errors when older patients were admitted to hospital, with health services reporting less than 0.3 outstanding unintentional discrepancies per patient when medicines were reconciled. Recent Australian studies report

[a] Information on the High 5s Project can be accessed at: <https://www.high5s.org/bin/view/Main/WebHome>

[b] World Health Organization. The High 5s Project Interim Report. Geneva. World Health Organization, 2014.

patients have 1–2.5 discrepancies when medicines are not reconciled.[c] Twelve adverse events (AEs) were reported. Each AE was analysed and found to be the result of failure to follow the SOP.

Most health services found the performance measures specified in the project to be useful for identifying:

- the quality of the process performed;
- areas for improvement;, and
- training requirements.

Conclusion

Implementation experience data highlighted that implementing medication reconciliation was challenging. It is a complex process that involves several disciplines and successful implementation requires a change of culture within the health service. Major barriers were: lack of resources for performing medication reconciliation, collecting performance data and educating staff; lack of executive support; and limited buy-in by clinicians.

Implementing an effective and sustainable medication reconciliation system requires:

- recognition that medication reconciliation is a patient safety priority
- senior leadership support from the health service executive and senior clinicians
- interested and influential clinical champion(s)
- resources to conduct medication reconciliation and measure progress
- ongoing staff training
- policies and procedures on medication reconciliation that clearly outline the roles and responsibilities of different clinicians
- integration of the process into workflow, electronic health records and health service information systems.

[c] Roughead E, Semple S, Rosenfeld E. Literature Review: Medication Safety in Australia 2013. Sydney. ACSQHC, 2013.

2. Introduction

The World Health Organization (WHO) launched the High 5s Project in 2007 to facilitate the implementation and evaluation of standardised patient safety solutions (in the form of SOPs) within a global learning community.[d] The High 5s Project is an international collaboration carried out in seven countries: Australia, Germany, France, the Netherlands, Singapore, Trinidad and Tobago, and the United States of America. Canada and the United Kingdom contributed to the development of the High 5s Project but no longer participate in the Project. Lead Technical Agencies in each participating country coordinate the national activities of the Project. Its global activities are coordinated by the WHO Collaborating Centre on Patient Safety, the Joint Commission[e]. The mission of the High 5s Project is to facilitate implementation and evaluation of standardised patient safety solutions within a global learning community to achieve measurable, significant and sustainable reductions in high-risk patient safety problems.

The Commission is the lead technical agency for the project in Australia. The patient safety solution selected for implementation in Australia was 'Assuring medication accuracy at transitions of care' using the process of medication reconciliation.

This report summarises the results of the Australian arm of the High 5s Project for the period January 2010–March 2013. Further information is available in the WHO *High 5s Project Interim Report* 2014.[1]

The patient safety problem

Poor communication between health professionals and between health professionals and patients and/or carers at transfer of care is a leading cause of medication errors. Around half of the medication errors that occur in hospital are estimated to occur on admission or discharge from a clinical unit or hospital[2] and around 30% of these errors have the potential to cause patient harm.[3,4] They are also an economic burden to health services.[5] These errors can occur when obtaining the patient's medication history (e.g. on admission to hospital); when recording the medicines in the medical record; and when prescribing medicines on admission, on transfer to another ward and at discharge.[5] Australian studies have found that from 60–80% of people had a discrepancy with their medication history when they were admitted to hospital.[6] On average, patients experienced from 1–2.5 discrepancies between the medicines taken prior to presentation to hospital and those ordered on admission to hospital.[6]

The solution

Medication errors at transfer of care can be substantially reduced by implementing a formal process of medication reconciliation.[7-9]

Project objectives

1) To test the feasibility of implementing a standardised medication reconciliation protocol within a group of hospitals across a number of countries; and
2) To demonstrate the effectiveness of the SOP in improving patient safety by reducing the risk of adverse medicines events.

[d] Information on the High 5s Project can be accessed at: <https://www.high5s.org/bin/view/Main/WebHome>.

e The Joint Commission is an independent, not-for-profit organization which accredits and certifies more than 20,500 health care organizations and programs in the United States. Information on The Joint Commission can be accessed at: <http://www.jointcommission.org/>

Structure of the report

Section 3 describes the medication reconciliation SOP, including how medication reconciliation should be performed and integrated into work practice.

Section 4 describes the methodology health services were required to follow when implementing and evaluating the SOP. This includes the design of the implementation strategy, the initial assessment of the patient safety culture within the organisation and the multipronged approach to evaluation involving the collection of quantitative and qualitative data describing the implementation experience.

Section 5 presents:

- the results of the evaluation;
- the extent to which the implementation strategy was followed;
- the implementation experience; and
- improvements in the rate and quality of the medication reconciliation performed.

Sections 6 and 7 discuss the impact of the SOP on health service culture and processes and the effect on patient care. Lessons learned about implementing medication reconciliation in Australian hospitals and critical success factors are also presented.

Section 8 reviews the resources developed during the project to assist health services implement the medication reconciliation SOP.

The results are summarised in Section 9.

3. Medication reconciliation standard operating protocol

The medication reconciliation SOP describes:

- the medication reconciliation process
- implementation strategy
- evaluation strategy.

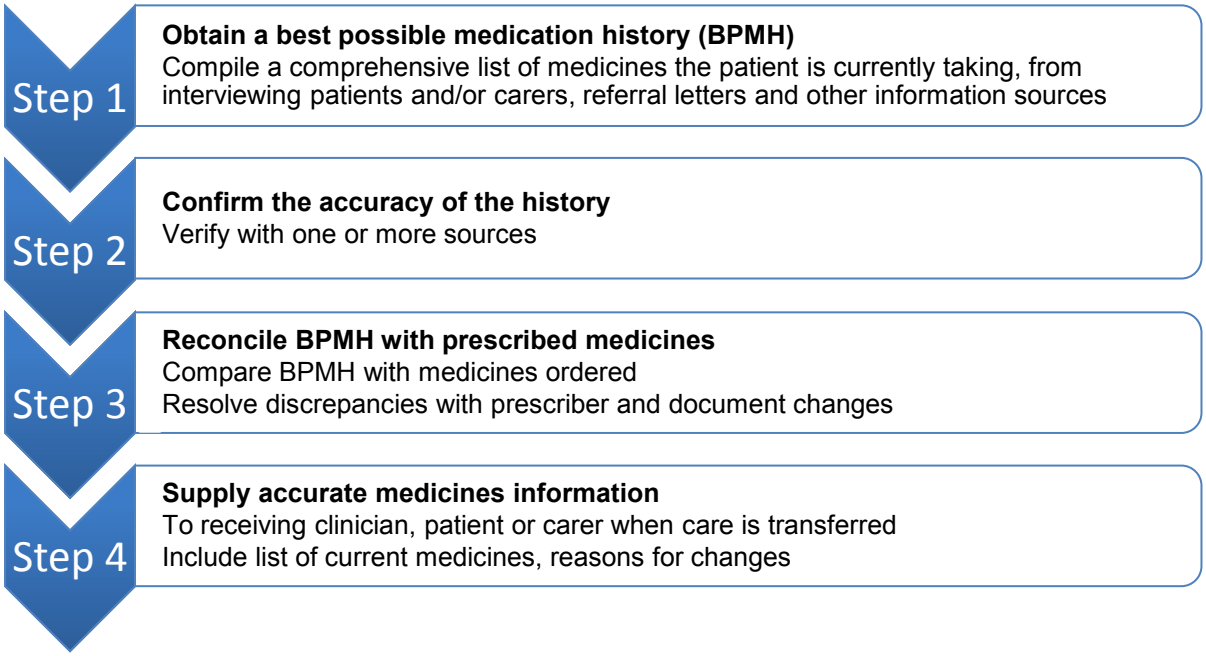
The SOP was supported by a 'Getting started kit' that provided practical guidance and examples to assist health services implement and evaluate the SOP.

Medication reconciliation is described in the SOP as:

> 'The formal process in which healthcare professionals partner with patients to ensure accurate and complete medication information transfer at interfaces of care.'

This involves using a systematic process to obtain a 'best possible medication history' (BPMH), which reflects an accurate and complete list of all medications taken prior to admission to hospital. The BPMH is used to create admission orders or is compared to admission medication orders in order to identify and resolve any discrepancies. The steps of the process are outlined in Figure 1. The process aligns with current Australian policy[10] and practice[11].

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



The SOP requires implementation of a formal, standardised medication reconciliation process that is multidisciplinary, integrated into existing workflow and involves patients and carers/families. Clinicians are required to be trained to:

- obtain the BMPH
- reconcile the history with medicines ordered
- resolve any discrepancies.

This process should be completed within 24 hours of admission. The initial focus of the project was on patients aged 65 or older admitted through the emergency department (ED) to inpatient services.

4. Method

Health services were recruited through an expression of interest process and were required to commit to a five-year project. Training was provided through a series of workshops, webinars and teleconferences. The sites were supported by a dedicated project officer from the Commission and had access to Australian implementation resources that included the National Medication Management Plan[f] and staff training materials with the MATCH-UP Medicines[g] theme. A list of resources developed for the project is provided in Section 8.

Health services were required to:

1. Secure senior leadership commitment and form a multidisciplinary project team.
2. Complete a patient safety culture survey.
3. Implement the medication reconciliation SOP using quality improvement methodology (see Box 1).
4. Evaluate improvements using a comprehensive evaluation plan.
5. Spread the medication reconciliation process to all eligible patients in all locations in the health service.

Box 1. Implementation strategy

1. Establish an oversight committee.
2. Develop a project work plan.
3. Complete a risk assessment of proposed process.
4. Test the process in a pilot ward.
5. Spread the process to other wards.
6. Develop a communication plan.
7. Evaluate using performance measures.
8. Maintain and improve the process.

Evaluation strategy

A multipronged approach was used to evaluate the project. This comprised:

1. a qualitative evaluation of health service implementation experiences through:
    a. a questionnaire submitted every six months
    b. interviews with five selected health services
2. a quantitative component using SOP specific performance measures
3. analysis of events that may represent SOP failures.

Prior to implementing the SOP, staff at the health services were required to complete a hospital survey on patient safety culture.

[f] The national Medication Management Plan (MMP) is a form designed for clinicians to record the 'best possible medication history' (BPMH), assess patient risk of adverse medicine events, and document the reconciliation process, discrepancies and their resolution. See: <http://www.safetyandquality.gov.au/our-work/medication-safety/medication-reconciliation/>.

[g] MATCH UP Medicines educational materials are available from: <http://www.safetyandquality.gov.au/our-work/medication-safety/medication-reconciliation/>.

5. Results

The project commenced in January 2010, with 18 health services (26 hospitals) recruited through an expression of interest process. Health services agreed the goal of the project was to effect a sustainable medication reconciliation process in their hospitals.

By December 2012, 12 health services had implemented the medication reconciliation process and ten of them were submitting performance data. Two private hospitals were not submitting data because of resource constraints. Five health services had withdrawn from the project and one was still working on implementation. Loss of key personnel, changes in organisational priorities and burden of data collection were the main reasons for leaving the project.

5.1. Patient safety culture

All participating hospitals were required to administer the Agency for Health Research and Quality (AHRQ) Hospital Survey on Patient Safety Culture[h] prior to implementing the SOP.

The AHRQ Hospital Survey on Patient Safety Culture is designed to assess hospital staff opinions about patient safety issues, medical errors, and event reporting. The survey includes 42 items that measure 12 areas, or composites, of patient safety culture. (See Figure 2)

The survey also includes two questions that ask respondents to provide an overall grade on patient safety for their work area/unit and to indicate the number of events they reported over the past 12 months.

The survey was adapted to the Australian health environment and administered between May 2010 and December 2010. Twenty-four hospitals (from 16 health services) participated.

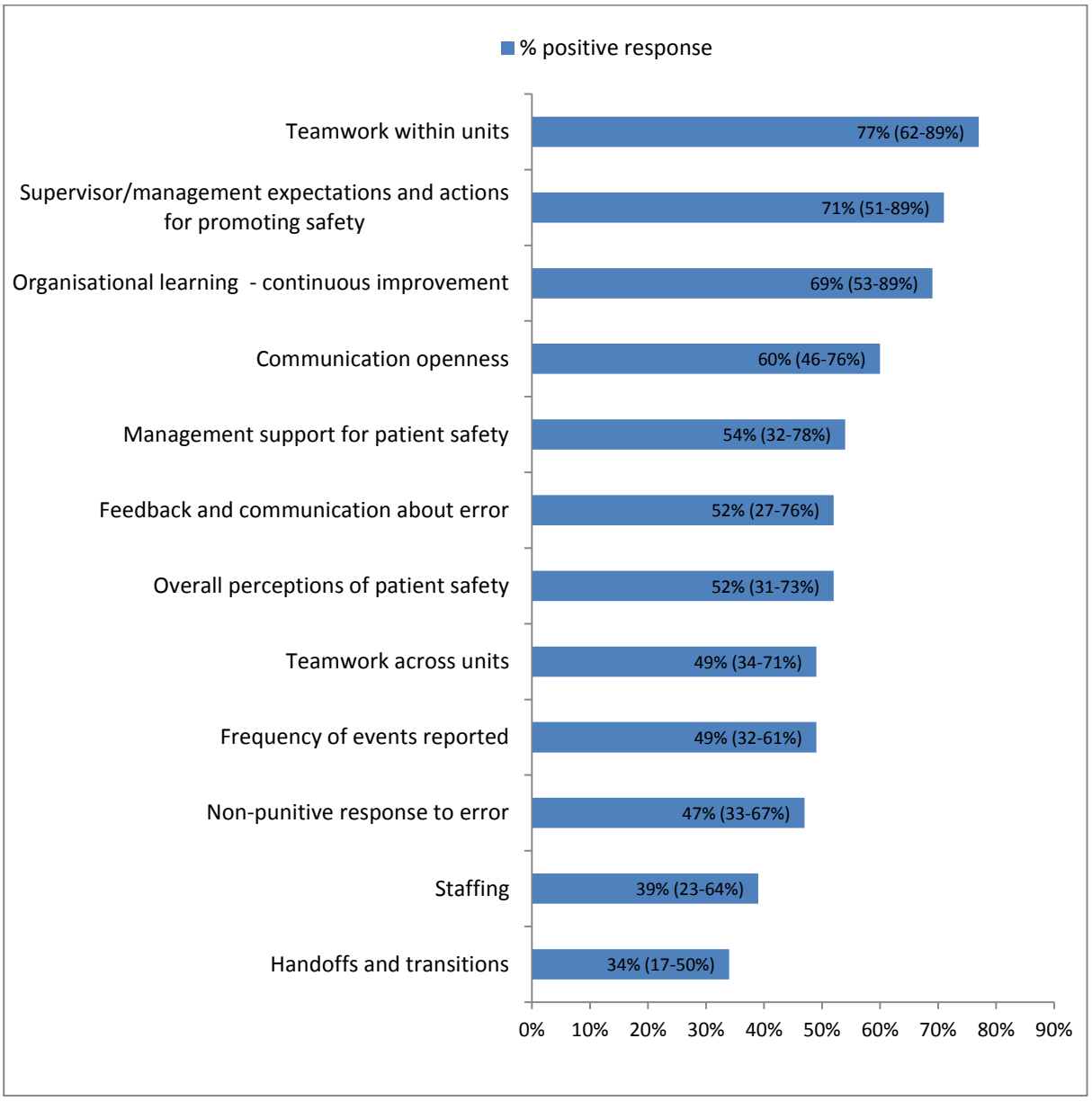
A total of 8410 surveys were distributed and 3185 were completed – a response rate of 41% (range 21–100%). High positive responses were reported for three patient safety culture composites: teamwork within units (77%); supervisor/manager expectations and actions promoting patient safety (71%); and organisational learning – continuous improvement (69%). Only 34% reported a positive response on handoffs and transitions; 39% of staff surveyed believed that staffing levels were sufficient for patient care; and only half (49%) reported a positive response to teamwork across units. See Figure 2.

Analysis of the data for the hand-offs and transitions composite , those elements that measure the safety of the clinical handover process, found a variation in patient safety culture across work areas and amongst the different categories of staff.

Clinical handover, staffing, teamwork across units, and engaging with junior medical staff were identified as potential areas for improvement. Hospitals were encouraged to use their individual survey results to identify areas for improvement and those stakeholders who should be engaged in the SOP implementation.

[h] The survey is available from the AHRQ website: <www.ahrq.gov/qual/hospculture>.

Figure 2. Patient safety culture dimensions in Australian health services

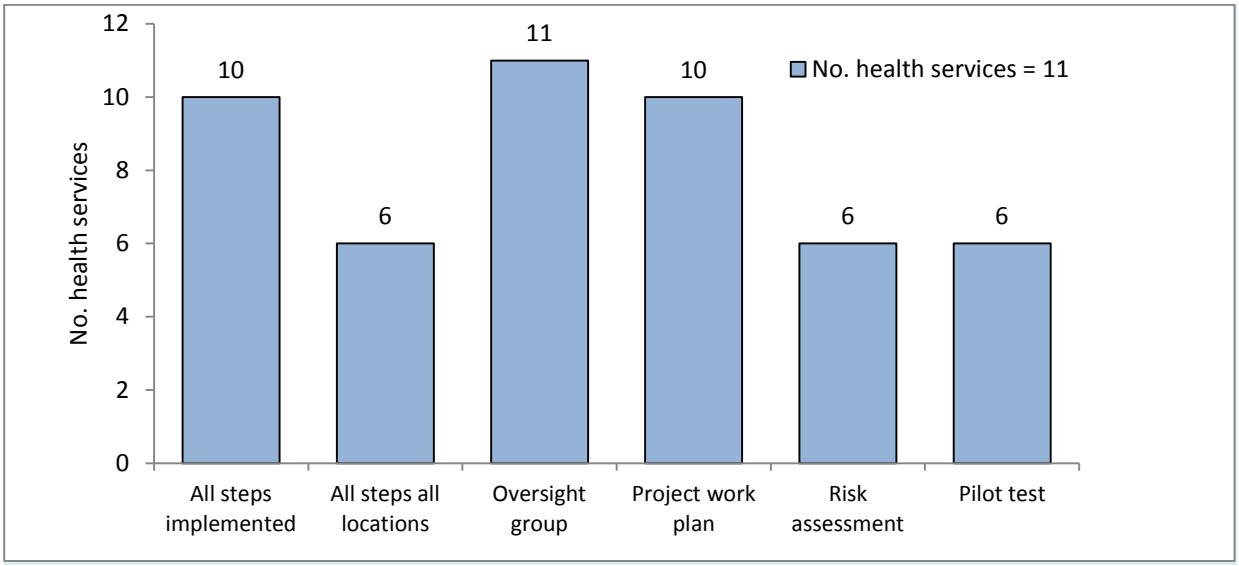


5.2. Implementation experience

Up until June 2012, health services were required to complete an online 67-item questionnaire on their experiences in implementing the SOP every six months. Eleven health services responded to the Implementation Experience Survey in June 2012. Ten of the 11 health services had implemented all the steps in the medication reconciliation process but five had yet to spread the process to all locations (see Figure 3)

Most health services followed the SOP implementation strategy. Each had established a project oversight group. Project coordinators were mainly pharmacists. Nine of the 11 health services designated at least one person as a role model or champion for each discipline involved with SOP-related activities. Ten health services developed a project work plan and around half the sites conducted a risk assessment of the new process. Slightly more than half the sites piloted the SOP.

Figure 3. Implementation status at June 2012



One health service implemented a multidisciplinary process, with doctors and nurses trained in taking a BPMH and reconciling medicines. In the other health services, pharmacy staff, mainly pharmacists, were responsible for taking the BPMH and reconciling medicines. The steps of the medication reconciliation process were implemented without change. Health services used a mix of paper and electronic tools to document the BPMH and record medicines reconciled.

5.2.1. Barriers and challenges

Lack of resources was the main barrier to implementing the SOP. Many health services underestimated the resources they would need, especially for educating staff and evaluating the process. The burden of the data collection for performance measures was an ongoing issue for all sites.

Other challenges were those commonly experienced when implementing quality improvement projects:

- competing priorities in the organisation
- lack of support from health service leaders
- loss or transfer of key personnel
- initial lack of clinician buy-in
- difficulty reaching all clinical staff for training
- lack of information systems support for the process.

Private hospitals found implementing the SOP particularly difficult as pharmacy services were limited, and in many cases there were few salaried medical officers on staff.

Medication reconciliation was perceived as pharmacy business and most sites experienced challenges on weekends and after hours when pharmacists were unavailable and when pharmacists were on leave. Changing the organisational culture from one where medication reconciliation was primarily a pharmacist's role to one involving medical and nursing staff was challenging.

> **Health Service 1.** *'…another challenge we have faced is in engaging staff to share ownership of medication reconciliation. While we have tried to increase awareness of medication reconciliation with posters, competitions, staff*

education, etc. pharmacists still have ownership of the process and are the only ones formally doing and documenting medication reconciliation.'

In those hospitals where attempts were made to involve nursing staff and training was provided, there was resistance amongst the nursing staff to taking on additional activities and a lack of confidence in their ability to participate in the process.

> **Health service 2.** '*Nursing staff were not confident in conducting medication reconciliation on their own despite the training provided. Barriers to successful implementation by nursing staff were cited as time constraints, inadequate staff to perform the process, and lack of in-depth pharmaceutical knowledge.'*

Despite these difficulties health services reported the initiative was accepted and valued by other staff.

> **Health service 2: '***The implementation of the High 5s Project in the emergency department [ED] has seen increased cohesion among ED nursing staff, ward nursing staff and pharmacy staff with the initiative being welcomed by the ED staff.'*

The introduction of electronic health records (EHRs) in the EDs of some health services did not support the medication SOP, and led to a duplication of medication history documentation. This resulted in a reduction in the number of patients reconciled within 24 hours, and threatened the continuation of the project at one site. This highlighted the importance of project teams being aware of clinical information system initiatives that might impact on the project, and engaging with information technology (IT) services when clinical system changes are under way.

Barriers were overcome by:

- engaging staff and obtaining buy-in by actively engaging staff in the project, involving clinical champions and communicating with staff about the project
- training and educating staff on the risk of medication errors at transfer of care and how to take a BPMH and reconcile medicines. Considerable resources were required for training, particularly at sites implementing a multidisciplinary approach and where junior medical staff rotated through different hospitals
- securing leadership support to help spread the SOP throughout the organisation
- using performance measure data to:
    - obtain buy-in and engage staff outside the pharmacy, including senior clinicians and the health service executive
    - build a business case to extend the hours that medication reconciliation is performed
    - demonstrate the health service's compliance with the *National Safety and Quality Health Service (NSQHS) Standards*[12] for accreditation purposes

5.3. Performance measurement

Health services collected performance measure data at monthly intervals initially and then three-monthly to measure the effectiveness of the SOP in terms of the rate and quality of the medication reconciliation process. Data were collected for four measures by a trained independent observer who audited patient records for any outstanding discrepancies remaining after the medicines had been reconciled. Table 1 provides a description of the measures.

Data was validated and entered into a secure website where health services could compare their own results with national and international averages. Participating health services agreed on a target of less than 0.3 outstanding unintentional discrepancies per patient for the measure MR–3.

Table 1. High 5s performance measures

Type of measure	Description of measures	
Rate	**MR–1.** Percentage of eligible patients* with medicines reconciled within 24 hours of the decision to admit the patient	
Quality	**MR–2.** Mean number of outstanding undocumented intentional medication discrepancies per patient	Prescriber made an intentional choice to add, change or discontinue a medication but the choice is not clearly documented.
	MR–3. Mean number of outstanding unintentional medication discrepancies per patient	Prescriber unintentionally changed, added or omitted a medication the patient was taking prior to admission and this discrepancy has the potential to become a medication error that may lead to an adverse medicines events or adverse patient outcome.
	MR–4. Percentage of eligible patients with at least one outstanding unintentional medication discrepancy	

* Eligible patients were aged 65 years or over, and admitted through the ED to an inpatient service.

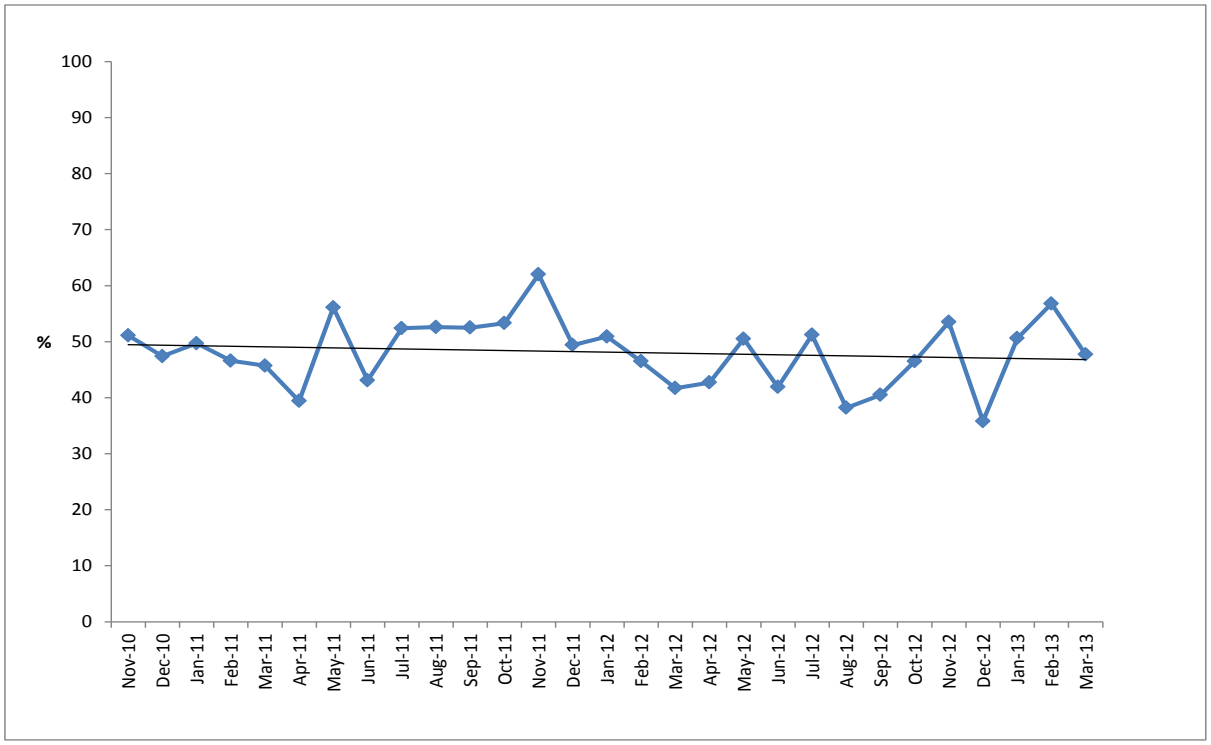
All records, or a random sample of 50 patient records, were audited to determine the percentage of eligible patients whose medicines were reconciled within 24 hours of the decision to admit (MR–1). A sample of 30 records of patients whose medicines had been reconciled within 24 hours of admission were further reviewed by the independent observer for the quality measures (MR–2 to MR–4).

Most health services experienced challenges collecting data for the performance measures. These included attaining timely access to medical records, and the resources required to collect the data and perform the role of independent observer.

5.3.1. Rate of medication reconciliation

During the period November 2010–March 2013, between 7 and 10 health services submitted data into the High 5s secure website. The percentage of eligible patients with medicines reconciled within 24 hours of the decision to admit the patient (MR–1) ranged from 9–98% across participating health services, with an average of around 49% (see Figure 4).

Figure 4. Percentage of eligible patients with medicines reconciled within 24 hours (aggregate)

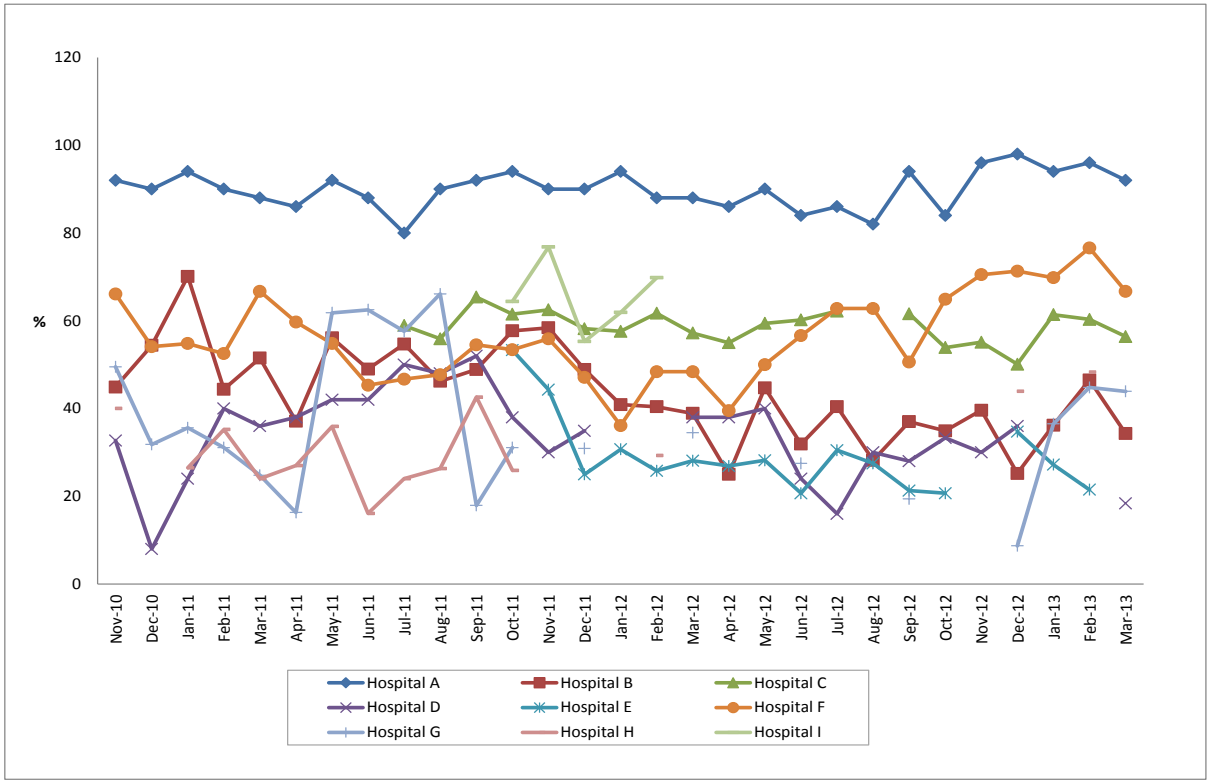


Rates varied across health services depending on the stage of implementation, resources available, particularly clinical pharmacists, and the spread of the intervention in the organisation. In one health service, the rate dropped after an electronic health record was implemented in the ED that did not support the SOP (see Figure 5).

Only one health service was able to perform medication reconciliation on over 80% of its eligible patients within 24 hours of admission. This health service had a seven-day-a-week pharmacy service with extended hours in the ED.

Several health services reported higher rates when medication reconciliation was measured 48 hours after admission.

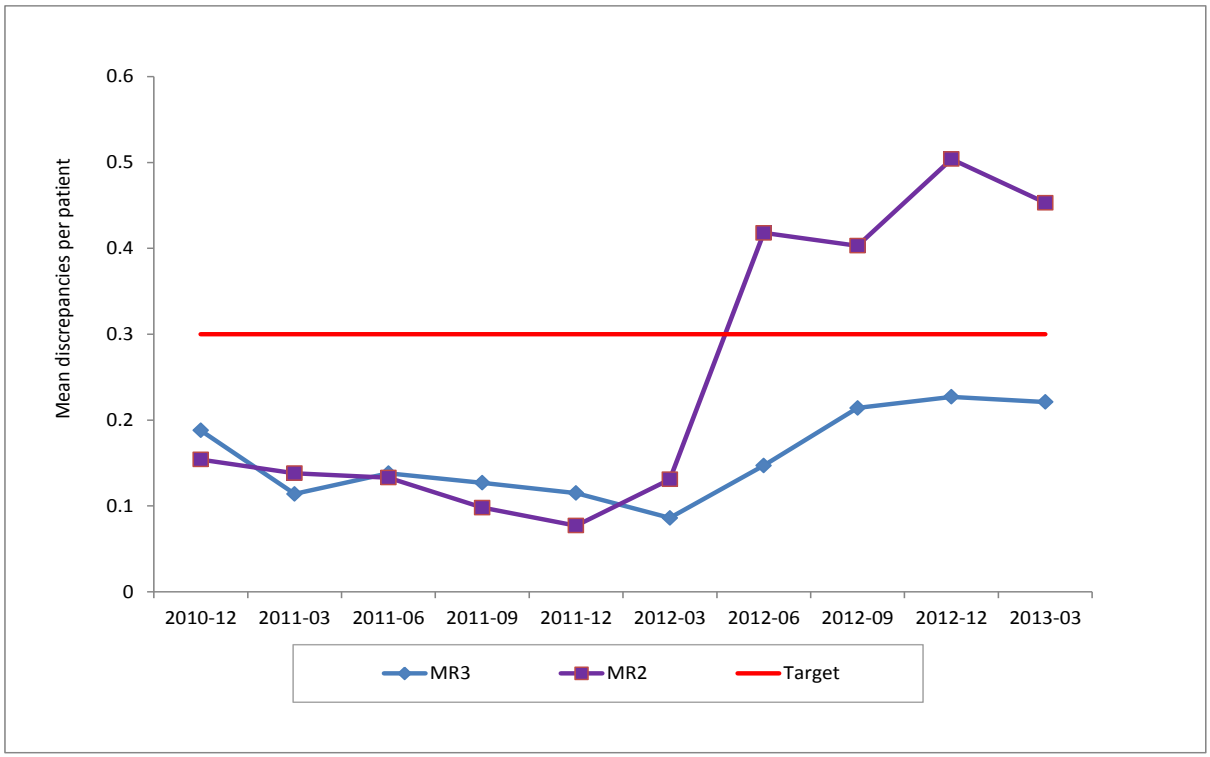
Figure 5. Percentage of patients with medicines reconciled within 24 hours by hospital



5.3.2. Quality of medication reconciliation

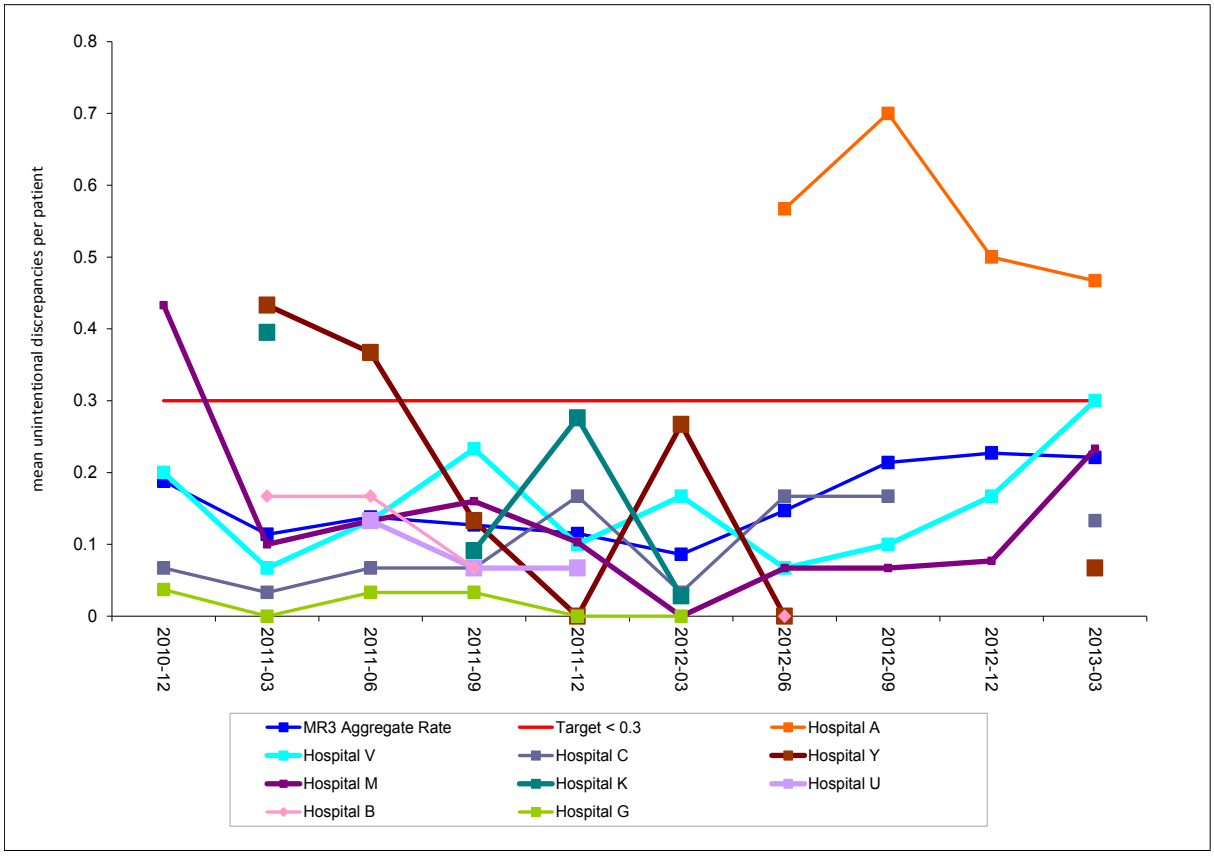
Rates of outstanding, undocumented intentional discrepancies (MR–2) and outstanding unintentional discrepancies (MR–3) are shown in Figure 6.

Figure 6. Mean number of outstanding undocumented intentional (MR–2) and unintentional (MR–3) medication discrepancies per patient (aggregate)



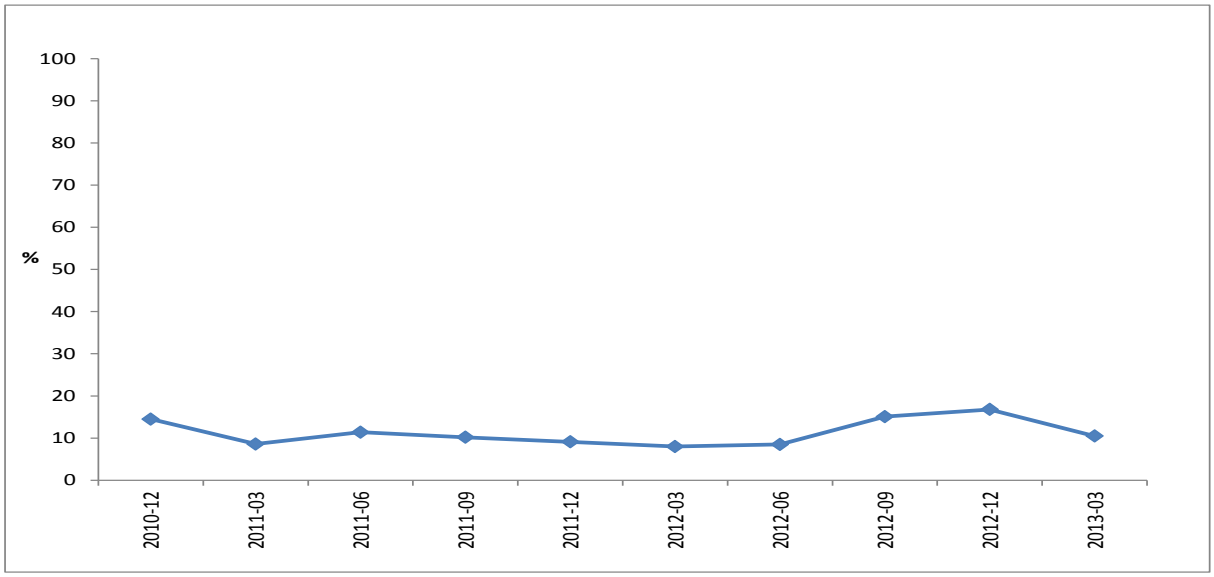
Rates of outstanding, unintentional medication discrepancies varied between hospitals; however all hospitals met the target of less than 0.3 outstanding unintentional discrepancies per patient over time (see Figure 7).

Figure 7. Mean number of outstanding unintentional medication discrepancies by hospital (MR–3)



The percentage of patients with at least one outstanding unintentional discrepancy (MR–4) decreased over time. The increase in rates from June 2012 was driven by variation within and across health services (see Figure 8).

Figure 8. Percentage of patients with one or more outstanding unintentional medication discrepancies (MR–4) (aggregate)



Overall, the data shows older patients who receive medication reconciliation at admission are at low risk of experiencing an adverse medicines event as the result of a discrepancy between the medicines taken prior to admission and those prescribed during the hospital admission.

5.3.3. Benefits of measuring performance

Most health services found the performance measures useful for identifying the quality of the process performed, areas for improvement and training requirements. The information was also useful for demonstrating the value of the SOP, and obtaining buy-in from other clinical staff and commitment from executive leadership. Data was reported back to project teams and quality and safety committees.

> **Health service 3:** '*Having sufficient data from performance measures has been a conduit to:*
>
> - *engaging pharmacy and other staff*
> - *achieving executive commitment to medication reconciliation as a key patient safety initiative.'*

Some sites collected additional information such as the number and type of errors avoided by the reconciliation process. This information was considered more useful than measures MR–2, MR–3 and MR–4 for convincing clinicians and health service management of the importance of medication reconciliation and for building the business case for additional resources.

By auditing the quality of the medication reconciliation process, several health services identified that some discrepancies, highlighted with prescribers, remained unresolved for some days and sometimes until time of discharge, causing delays in the discharge process. Two additional performance measures were developed to allow Australian health services to collect data on discrepancies that remained unresolved more than 48 hours after admission. Five sites collected and continue to collect and use this data to provide feedback to prescribers.

5.4. Event analysis

Hospitals were required to actively seek and investigate patient safety problems (events) that should have been prevented by the SOP. A systematic analysis of the facts and contributing factors of a patient safety incident was undertaken and a determination made as to whether the event was linked to the design and/or implementation of the SOP. Twelve event analyses were reported by four health services. All the events were the result of a failure to follow the SOP or medication reconciliation not being undertaken in a timely manner. None caused serious harm. The most common contributing factors identified were a lack of teamwork, education and training, and poor communication.

Individual health services used the event analysis reports to:

- improve the medication reconciliation process
- develop case studies for clinician education sessions to highlight what can go wrong when the medication reconciliation SOP is not followed.

6. Impact of the SOP

The objectives of the project were to assess whether it was feasible to implement a standardised operating protocol within a group of hospitals across a number of countries and demonstrate the effectiveness of the SOP in improving patient safety by reducing the risk of adverse medicines events.

- The SOP was implemented in Australia with few adaptations, suggesting that it was feasible to implement a standardised process of care across different hospitals.
- The SOP was effective in changing the culture and processes in the different health services and ultimately improving patient safety.

However, the pilots identified that the SOP worked best when supported by dedicated pharmacy resources.

6.1. Health service culture

Changing the culture within a health service is difficult and requires executive support and this was the experience of the health services participating in the project. Several health services reported the project raised the profile of medication safety within their organisation.

> **Health service 1:** *'The successful implementation of medication reconciliation in an organisation requires an entire culture change across the organisation involving all disciplines. Implementation is complex and difficult and it's hard not to get discouraged. However the positives have been a much greater awareness of medication safety across the organization'*

All health services introduced a form to record the BPMH and standardise the documentation of medication reconciliation. This was either the national Medication Management Plan (MMP), the Queensland Health Medication Action Plan (MAP) or an in-house medication reconciliation form. Several sites reported a change in health service culture, with the MMP/MAP being viewed as a multidisciplinary tool for communication rather than a pharmacy document, as had been the case prior to the High 5s Project.

> **Health service 5**: *'The medical specialties within the hospital now look for the MMP for reconciliation of the medications when reviewing the patient and completing the medication discharge summary. It has enabled the doctors to provide complete medication summaries to the primary care providers, including documenting the status of medications, e.g. continued, dose increased/decreased, ceased. This has led to improved communication in the transitions of care and also with the patient.*'

6.2. Health service processes

Eight health services reported they had integrated the High 5s medication reconciliation SOP into existing practices to some extent. The SOP enabled health services to have a standard, defined and improved protocol for medication reconciliation. This resulted in improvements in the quality of medication histories documented and the medication reconciliation performed.

> **Health service 7**: '*Raised awareness of the process of obtaining a BPMH, medication reconciliation and follow up of discrepancies ultimately resulted in better processes.'*

Resolving discrepancies early in the admission reduced delays in discharging patients.

Several health services were able to secure funding to employ additional pharmacists to introduce clinical pharmacy services to EDs and extend clinical pharmacy hours.

> **Health service 2:** *'Initiation of a Saturday ward-based clinical pharmacist service responsible for medication reconciliation on new, high-risk admissions at a metropolitan hospital significantly improved performance measure MR–1 rates.'*

Other health services introduced electronic systems to support the medication reconciliation process.

6.3. Effect on patient care

All reported the SOP improved patient safety as the result of improved processes.

The low figures reported for the quality measures MR–2 to MR–4 demonstrate the benefit of implementing a standard process for medication reconciliation. The process minimises the risk of patients experiencing an adverse event as a result of discrepancies between the medicines taken prior to admission and those prescribed during the hospital admission.

An unintended effect of the SOP reported by a few health services was that, by focusing on medication reconciliation, when resources were limited pharmacists may prioritise reconciliation over other clinical activities such as medication reviews. This had the potential to cause adverse consequences for patients. It was one of the reasons given by one health service for withdrawing from the project and another health service for reducing the number of patients having their medicines reconciled within 24 hours of admission.

6.4. Sustainability

Sites with weekend pharmacy services reported the SOP was sustainable. The five sites interviewed suggested sustainability of the SOP was dependent on a number of factors including:

- reducing the requirement for health service staff to provide ongoing education and including training within university curricula
- availability of electronic tools to support the medication reconciliation processes that are integrated with electronic health records and electronic medication management systems
- continued engagement and support from stakeholders
- extending pharmacy services to seven days a week.

Continued collection of performance measure data was not seen as sustainable without additional resourcing. The value of continuing to measure the quality measures MR–2 to MR–4 once the process was stable and the target reached was questioned by some sites, with health services opting to direct resources to patient care over data collection.

7. Lessons learned

Medication reconciliation is a complex process that involves several disciplines and requires a culture change within the health service. The SOP required health services to employ standard quality improvement methodology to implement the process. Most health services followed the implementation methodology and provided advice for other health services planning to implement a medication reconciliation process (see Box 2).The extent of implementation of the SOP was highly dependent on available clinical pharmacy resources.

Box 2. Advice for health services implementing the medication reconciliation SOP

- Changing culture is difficult and requires executive support.
- Choice of clinical champion is vital. The person must be interested and influential.
- Monthly collections of performance measures are more useful when commencing implementation of the process.
- Implement first and learn as you go along so [you] don't get caught up in the details. You can iron out problems as you encounter them.
- Have a set work plan:
    - Map your current process to identify areas of weakness and potential improvement.
    - Involve all key staff in implementation.
- Be aware of clinical information system initiatives that may impact on the project.

Although health services found the performance measures useful for measuring the quality of the medication reconciliation performed and identifying areas for improvement, information on discrepancies avoided by the SOP was more meaningful to clinicians. Collecting baseline data on the rate of medication discrepancies prior to introducing the SOP was not part of the evaluation and would have been useful for determining the impact of the SOP over time.

Obtaining a comprehensive and accurate medication history is difficult. It takes time and appropriately trained staff. This was seen as the domain of pharmacists, and other clinicians were unwilling to undertake this activity. However, health services reported participation in the High 5s Project had raised the profile of medication reconciliation and medication safety in their organisation and was continuing to drive change.

Success factors for implementing the components of the medication reconciliation SOP identified during the project are listed in Box 3.

Box 3. Medication reconciliation success factors

Admission history

- Staff are informed of their individual roles and responsibilities for taking a BPMH and are aware of who has responsibility after hours and at weekends when pharmacists may not be available.
- All staff with responsibilities for taking medication histories (including the primary medication history) are trained in how to take a best possible medication history (BPMH).
- Resources, materials and manpower are available for training staff on an ongoing basis.
- A structured form/tab (paper or electronic) is used to record the BPMH that prompts for the information required.

Reconciling medicines

- Medication reconciliation is conducted as a multidisciplinary process.
- Processes are in place to ensure outstanding discrepancies are followed up and resolved in a timely manner.
- A structured form/tab (paper or electronic) with a record of the BPMH is available for reconciling medicines and documenting when medicines are ordered or changed.
- Medication reconciliation is integrated with electronic health records and medication management systems.

Medication reconciliation on discharge

- Discrepancies are resolved early in the admission. This will reduce delays on discharge.
- The BPMH is completed before medicines are reconciled on discharge. If this has not been done earlier, the patient/carer must be interviewed and the BPMH obtained.

Patient and carer/family involvement

- Patients and/or carers are interviewed wherever possible.
- Relevant information is gathered prior to the interview e.g. patient's age, cognitive function, social background, medicine containers, medication lists, GP referral letters.
- Clinician training on taking a BPMH includes interview tips and techniques.
- Interpreters are used if patient and/or carer do not speak English.
- Patients are instructed to bring their medicine containers and/or a current medicines list to hospital, pre-admission clinics, hospital appointments.
- Patients and/or carers are informed of any new medicines commenced and changes to medicines prior to discharge and given a current and comprehensive list of medicines and any changes.
- Patients and/or carers are encouraged to keep an up-to-date list of medicines and show it to their healthcare providers at each new encounter.

8. Implementation resources

To assist health services implement the SOP a range of resources were developed in consultation with the High 5s health services. See Table 2.

Table 2. Implementation resources

Resource	Description
National Medication Management Plan (MMP)	A paper-based form to document the BPMH, assess patient risk of adverse medicines events and document the medication reconciliation process. Together with the National Inpatient Medication Chart, it forms the record of the patient's medicines. Such a form is considered essential for effective medication reconciliation.
Support materials for the MMP	User guide, poster and flash presentation on how to use the MMP.
MATCH UP Medicines Guide to Medication Reconciliation	Educational brochure and poster for health professionals.
Consumer wallet	For patients or carers to store their current medicines list and written medicines information. The wallet carries the message that 'Mistakes can happen with your medicines' and encourages patients and carers to maintain an up-to-date list of their medicines and show it to their health practitioners at each encounter.
Mistakes can happen with your medicines consumer information sheet	The information sheet carries the message that 'Mistakes can happen with your medicines' and encourages patients and carers to maintain an up-to-date list of their medicines and show it to their health practitioners at each new encounter.

These resources are available to all Australian health services from the Commission's Medication Reconciliation web page at: <http://www.safetyandquality.gov.au/our-work/medication-safety/medication-reconciliation/>.

9. Summary

It is feasible to implement the High 5s Assuring Medication Accuracy at Transitions of Care SOP in Australian hospitals. However the extent of implementation of the SOP is currently largely dependent on available clinical pharmacy resources.

In general, public hospitals that employed a larger number of clinical pharmacists were more able to implement a comprehensive medication reconciliation process at admission than private hospitals and public hospitals with fewer clinical pharmacists. Only one of the 12 health services reported that a majority (over 80%) of their eligible patients had their medicines reconciled within 24 hours of admission. The aggregate rate for this measure over the course of the project was stable at around 50% although the rate varied amongst health services from 9–98%.

The SOP was effective in minimising potential medication errors when older patients were admitted to hospital. This was evidenced by the low numbers of outstanding unintentional medication discrepancies reported over the course of the project. This supports the focus of the SOP on building the BPMH as soon as possible in the admission process, ideally within 24 hours, and using it as the foundation to ensure patients receive the right medicines at subsequent points of transfer within the hospital and at discharge.

Information from the health service experience surveys and interviews highlighted that implementing medication reconciliation is challenging. Major barriers were: the lack of resources for performing medication reconciliation, collecting performance data and educating staff; lack of executive support; and limited buy-in by clinicians.

Obtaining a comprehensive and accurate medication history is difficult and takes time. It requires clinicians to be appropriately trained and understand the importance of verifying the medication history using several sources of information. This was seen as the domain of pharmacists, and other clinicians were unwilling to undertake this activity. However, health services report that participation in the High 5s project has raised the profile of medication reconciliation and medication safety in their organisation and is continuing to drive change.

Medication reconciliation is a complex process that involves several disciplines. Successful implementation requires a culture change within the health service. Implementing an effective and sustainable medication reconciliation system requires:

- recognition that medication reconciliation is a patient safety priority
- senior leadership support from the health service executive and clinicians
- interested and influential clinical champion(s)
- resources to conduct medication reconciliation and measure progress
- ongoing training of clinical staff
- policies and procedures on medication reconciliation that clearly outline roles and responsibilities of the different clinicians
- integration of the medication reconciliation process into existing work flows, electronic health records and health service information systems.

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Annex 1. Australian High 5s hospitals

Participants comprised a mix of public and private health services of differing sizes and complexity, from regional centres and capital cities in five states. See Table 3.

Table 3. Australian High 5s hospitals

Hospital/health service	Description
The Alfred Hospital	Acute care, 400 bed, public tertiary referral hospital, Victoria
Armadale Health Service	Acute care, 250 bed public hospital, Western Australia
Epworth HealthCare	Acute care, 550 bed, private hospital, Victoria
Greater Southern Area Health Service	9 rural public hospitals (total of 810 beds), New South Wales
Logan Hospital*	Acute care 390 bed public hospital, Queensland
Mater Health Services (4 hospitals)	Tertiary hospital with public and private beds (in total approximately 1000 beds) consisting of: • Mater Adult Hospital (public) • Mater Children's Hospital (public and private) • Mater Mothers' Hospital (public and private) • Mater Private Hospital, Queensland
Noosa Hospital	Acute care, 92 bed, private hospital, Queensland
North West Regional Hospital	Acute care, 120 bed, public hospital, Tasmania
Prince of Wales Hospital	Acute care, 550 bed, public tertiary referral hospital, New South Wales.
Redland Hospital	Acute care, 150 bed, public hospital, Queensland
Rockingham Peel Group	Acute care, 180 bed public hospital, Western Australia
Royal North Shore Hospital	Acute care, 560 bed, public tertiary referral hospital, New South Wales.
The Wesley Hospital	Acute care, 530 bed, private hospital, Queensland

* withdrew from the project in October 2012.