Partnering with patients to reduce medication errors and adverse drug events at transitions of care

Graham Bedford, Program Manager
Helen Stark, Senior Project Officer,
Margaret Duguid, Pharmaceutical Advisor
Partnering with patients

Clinical benefits include:\(^1\)

- Decreased morbidity and mortality
- Decreased readmission rates
- Reduced length of stay
- Improved adherence to treatment (medication) regimens
Medication errors are one of the leading causes of injury to hospital patients.

More than 50% of medication errors occur at transitions of care.  
- Admission, transfer and discharge

20% of adverse drug events result from errors at interfaces of care.
Medication errors at interfaces of care

Medication histories

- Up to 67% of contain one or more errors\textsuperscript{4}
- Up to a third have potential to cause harm\textsuperscript{5}

Medication ordered on admission

- 30 – 70% patients ≥ 1 unintended variation between medication history and admission orders \textsuperscript{5,6}

Medication ordered on discharge

- 12 – 15% patients have an error on discharge script \textsuperscript{7,8}

Readmission 2.3 times more likely if ≥ 1 medicines unintentionally omitted from the discharge summary\textsuperscript{9}
Formalised medication reconciliation at admission, transfer and discharge reduces medication errors by 50 – 94% \(^3,4,7,11\)

Errors reduced if patients:
- bring in medicine containers
- have a current list of medicines
Medication reconciliation

Objective
Reduce medication errors and adverse events through formalised process of medication reconciliation that actively involves patients, carers and or families.

Intervention:
WHO High 5s Project- Assuring medication accuracy at transitions of care
WHO High 5s Project

Implement standard operating protocol (SOP) for multidisciplinary medication reconciliation conducted in partnership with patients and carers/families

5 year international project, currently in third year

13 Australian health services participating

ACSQHC:
- Conducting Australian collaborative
- Providing resource materials
WHO High 5s Project methodology

Phased approach
- Focus on patients aged 65 years or older admitted to inpatient services through the ED

Participating hospitals are required to:
- Implement the SOP
- Report on:
  - Performance measures (process and quality of medication reconciliation)
  - SOP implementation experience
  - Adverse event analysis related to medication reconciliation
Medication reconciliation SOP process

Steps

1. **Compiling a best possible medication history (BPMH) in partnership with the patient and family/carer**

2. **Confirming** the medication history with at least one other source

3. **Reconciling the BPMH** with medication orders on admission, transfer and discharge

4. **Supplying** accurate medicines information when care is transferred
Step 1. Best Possible Medication History

“A BPMH is a medication history obtained by a clinician which includes a thorough history of all regular medication use (prescribed and non-prescribed), using a number of different sources of information.”

It is the baseline from which:

- drug treatment is continued on admission
- therapeutic interventions are made
- self-care is continued after discharge
Step 1. Best Possible Medication History

Main point is to elicit what the patient is actually taking

Patient is interviewed whenever possible to obtain:

a. details of previous adverse drug events and allergies

b. all medicines the patient is taking at the time of presentation to hospital including:
   • prescribed medicines
   • non-prescribed, over-the-counter medicines
   • Complementary/herbal medicines
   • PRN meds

c. Recently ceased or changed medications
Step 2. Confirm accuracy of history with at least one other source

A second source is used to confirm the medicines information obtained.

Sources include

- Medicine containers (including blister packs)
- Patient’s medicines list
- Community prescribers and/or community pharmacist
- Carer or family
- Previous medical records e.g. discharge summaries, electronic health records

Patients/carers instructed to bring medicines containers and current medicines list into hospital
Step 2. Confirm accuracy of history with at least one other source

Percent Accuracy of Sources of information for Best Possible Med History (BPMH)

- Incomplete: 65.2%
- Inaccurate: 50%
- 60%
- 71.4%
- 81.8%
- 82.3%
- 86.7%
- 90.5%

Armadale Health Service Data
Documenting the BPMH

National Medication Management Plan

- Prompts for key information (drug name, dose, form, frequency, duration)
- Documentation of:
  - BPMH
  - Plan to continue/cease/change medicine
  - Medicines recently ceased
  - Allergies and adverse drug reactions

- Kept with NIMC
National Medication Management Plan

Checklist to aid with patient interview

<table>
<thead>
<tr>
<th>MEDICATION HISTORY CHECKLIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescription medicines</td>
</tr>
<tr>
<td>Sleeping tablets</td>
</tr>
<tr>
<td>Inhalers, puffers, sprays, sublingual tablets</td>
</tr>
<tr>
<td>Oral contraceptives, hormone replacement therapy</td>
</tr>
<tr>
<td>Over-the-counter medicines</td>
</tr>
<tr>
<td>Analgesics</td>
</tr>
<tr>
<td>Gastrointestinal drugs (for reflux, heartburn, constipation, diarrhoea)</td>
</tr>
<tr>
<td>Complementary medicines (e.g. vitamins, herbal or natural therapies)</td>
</tr>
</tbody>
</table>

Risk assessment for medication misadventure

<table>
<thead>
<tr>
<th>MEDICATION RISK IDENTIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of Independence</td>
</tr>
<tr>
<td>Lives alone</td>
</tr>
<tr>
<td>Lives in residential care facility</td>
</tr>
<tr>
<td>Uses dose administration device i.e. spacers, inhaler devices</td>
</tr>
<tr>
<td>Uses administration aid (specify):</td>
</tr>
<tr>
<td>Uses medication list</td>
</tr>
<tr>
<td>Swallowing issues</td>
</tr>
<tr>
<td>Has impaired hearing</td>
</tr>
<tr>
<td>Has impaired vision</td>
</tr>
<tr>
<td>Other information:</td>
</tr>
</tbody>
</table>

Language spoken: [ ] Yes [ ] No
[ ] Not an issue
Step 3. Reconcile history with prescribed medicines

- BPMH is compared to admission medication orders on NIMC
- Any discrepancies identified are resolved and documented.

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Dose</th>
<th>Frequency</th>
<th>Indication (confirm with patient)</th>
<th>How long or when started</th>
<th>Dr’s Plan On Admission: Continue: Continue, Withhold, Cease:</th>
<th>Supply at Home:</th>
<th>Reconcile:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frusemide (cover) Po</td>
<td>40mg</td>
<td>mane</td>
<td>HF</td>
<td>72 yrs</td>
<td>PR: Pharm</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Digoxin 0.125mg Po</td>
<td>1.25mg</td>
<td>mane</td>
<td>HF</td>
<td>72 yrs</td>
<td>PR: ___</td>
<td>W</td>
<td>✓</td>
</tr>
<tr>
<td>Ramipril 5mg Po</td>
<td>5mg</td>
<td>wave</td>
<td>HF</td>
<td>3mths</td>
<td>PR: ___</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Metoprolol 50mg Po</td>
<td>25mg</td>
<td>mane</td>
<td>HF</td>
<td>1mth</td>
<td>PR: ___</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Atorvastatin 20mg Po</td>
<td>20mg</td>
<td>wave</td>
<td>High Cholesterol</td>
<td>72 yrs</td>
<td>PR: ___</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Aspirin 100mg Po</td>
<td>100mg</td>
<td>mane</td>
<td>Anti-platelet</td>
<td>72 yrs</td>
<td>PR: ___</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Step 4. Supply accurate medicines information to next provider and the patient / carer

Whenever the patient’s care is transferred the person taking over the patient’s care is supplied with an accurate and complete list of the patient’s medicines and explanation of any changes.

- Health professional; and
- Patient and family/carer
Step 4. Supply accurate medicines information to next provider and the patient/carer

At discharge the medicines ordered (discharge prescription) are reconciled against the current NIMC and the BPMH. This reconciled list is used to produce the patients medication list and update the summary provided to the patient’s GP.
Patient role in medication reconciliation

Only constant in the process

Contributing to accurate and complete medication history by:

- Bringing medicines containers into hospital
- Maintaining a current list of medicines (including OTC, complementary medicines)
- Being honest about their medicine taking behaviour

Helping prevent medication errors and adverse events by:

- Speaking up if they are unsure about their medicines, or suspect a medication error

Participation encourages ownership and medicines self-management
Performance measures

% Patients ≥ 65 years reconciled within 24 hours of admission
Range 16 – 94%

![Graph showing the percentage of patients with medications reconciled within 24 hours of admission over time from 2011 to 2013.]
High 5s hospitals results

Quality of process

- Potential medication errors (after reconciliation)
- Identified by an independent observer

On average hospital rates are below absolute target of 0.3 unintentional discrepancies per patient
WHO High 5s medication reconciliation measure

Mean number of outstanding unintentional med errors per 100 patients

Target <0.3 discrepancies Per patient

Armadale Health Service Data
Medication reconciliation resources

MATCH UP Medicines Resources

Using the Medication Management Plan

Medication management plan + implementation resources
Consumer resources

- Consumer wallet / information sheet
  - “Mistakes can happen with your medicines”
  - How to prevent them
  - Have a medicines list
Mistakes can happen with your medicines when you go into and come out of hospital, change wards or see different health professionals in the community. Having the right information about your medicines at all times will help prevent mistakes.

Health professionals need to know about all the medicines you use so they can make the right decisions about your health. Medicines include prescription, over-the-counter, herbal and natural medicines, and come in different forms, such as tablets, lotions, patches and drops.

**You and your carer can help prevent medicine mistakes**

Keep track of all your medicines with a Medicines List. Your doctor, nurse or pharmacist can help you fill it out. Speak up if you're unsure about your medicines.

**LEAVING HOSPITAL**

- Ask which medicines you should continue using at home and for all changes to be explained.
- Leave with an up-to-date Medicines List.
- Check the active ingredients of all your medicines to avoid doubling up. Ask your health professional if you're unsure.
- Show your regular doctor and pharmacist your updated Medicines List and hospital discharge information so they can update their records.

**GOING INTO HOSPITAL**

- Take your Medicines List and medicines containers with you and show them to the doctor, nurse or pharmacist.
- Your medicines should be checked on arrival and when you've moved around the hospital.
- For your safety, you may be asked questions about your medicines, so answer them honestly.

**AT HOME/SEEING ANY HEALTH PROFESSIONAL**

- Keep your Medicines List up to date.
- Take your Medicines List every time you visit your regular health professional or someone new. If you stop or start a medicine, let them know.
- Ask your doctor or pharmacist for a medicines review if you have any problems with your medicines.

**HELP PREVENT MEDICINE MISTAKES WITH AN UP-TO-DATE MEDICINES LIST**

Order, print or download an NPS Medicines List from www.nps.org.au/medicineslist or ask your pharmacist. It is also available in other languages and as an iPhone app.

**BE MEDICINEWISE**

Find out how at www.nps.org.au/medicinewise

---

The Australian Commission on Safety and Quality in Health Care

This information is not intended to take the place of medical advice and you should seek advice from a qualified health professional. Reasonable care is taken to provide accurate information at the time of creation. Where permitted by law, NPS and the Australian Commission on Safety and Quality in Health Care disclaim all liability (including for negligence) for any loss, damage or injury resulting from reliance on or use of this information.
Keep your Medicines List up-to-date

<table>
<thead>
<tr>
<th>Name of medicine</th>
<th>Strength</th>
<th>What is the medicine for?</th>
<th>How much do I use and when?</th>
<th>Special instructions or comments</th>
<th>Date started</th>
<th>When to stop or review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active ingredient</td>
<td>Regularly</td>
<td>Pain, non-acute arthritis</td>
<td>2 tablets every 4 hours</td>
<td>Doctor recommends taking regularly rather than as needed for pain</td>
<td>18/07/12</td>
<td>18/12/12</td>
</tr>
</tbody>
</table>

## MEDICINES LIST

### IMPORTANT THINGS TO KNOW ABOUT YOUR MEDICINES

To help you get the best results from your medicines, there are important questions you can ask your doctor, pharmacist or health professional including:

- Why do I need to take this medicine?
- How should my medicine be stored?
- How often do I take my medicine? When will my medicine start to work?
- How should I take my medicine? With water or food?
- When should I take my medicine and for how long?
- Do I need to avoid any other medicines, food or drinks when I am taking this medicine?
- What should I do if I miss a dose?
- Do I need regular check ups or tests while taking the medicine?
- What are the side effects of taking this medicine?
- What should I do if a side-effect occurs?
- How should I store my medicine?

Write down any other questions you may have:

If you need more space to write your medicines, visit our website at www.nps.org.au to print more Medicines List pages or to order extra copies. Keep all your pages together.
Criterion 2: The clinical workforce accurately records patient’s medication history and this history is available throughout the episode of care.

Criterion 4: The clinician provides a complete list of a patient’s medicines to the receiving clinician and patient when handing over care or changing medicines.

Criterion 5: The clinical workforce informs patients about their options, risks and responsibilities for an agreed medication management plan.
### Medication Safety Accreditation Standard

<table>
<thead>
<tr>
<th>Actions required</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6.1 A best possible medication history is documented for each patient</td>
<td></td>
</tr>
<tr>
<td>4.6.2 The medication history and current clinical information is available at</td>
<td></td>
</tr>
<tr>
<td>the point of care</td>
<td></td>
</tr>
<tr>
<td>4.7.1 Known medication allergies and adverse drug reactions are documented in</td>
<td></td>
</tr>
<tr>
<td>the patient clinical record</td>
<td></td>
</tr>
<tr>
<td>4.8.1 Current medicines are documented and reconciled at admission and transfer</td>
<td></td>
</tr>
<tr>
<td>of care between healthcare settings</td>
<td>Developmental</td>
</tr>
<tr>
<td>4.12.1 A system is in use that generates and distributes a current and</td>
<td>Core</td>
</tr>
<tr>
<td>comprehensive list of medicines and explanation of changes in medicines</td>
<td></td>
</tr>
<tr>
<td>4.12.2 A current and comprehensive list of medicines is provided to the</td>
<td>Core</td>
</tr>
<tr>
<td>patient and/or carer when concluding an episode of care</td>
<td></td>
</tr>
<tr>
<td>4.12.3 A current and comprehensive list of medicines is provided to the</td>
<td></td>
</tr>
<tr>
<td>receiving clinician during clinical handover</td>
<td></td>
</tr>
<tr>
<td>4.12.4 Action is taken to increase the proportion of patients and receiving</td>
<td></td>
</tr>
<tr>
<td>clinicians that are provided with a current comprehensive list of medicines</td>
<td></td>
</tr>
<tr>
<td>during clinical handover</td>
<td></td>
</tr>
</tbody>
</table>
### Medication Safety Accreditation Standard

<table>
<thead>
<tr>
<th>Actions required</th>
<th>Core/Developmental Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4.14.1</strong> An agreed medication management plan is documented and available in the patient’s clinical record.</td>
<td></td>
</tr>
<tr>
<td><strong>4.15.1</strong> Information on medicines is provided to patients and carers in a format that is understood and meaningful.</td>
<td></td>
</tr>
<tr>
<td><strong>4.15.2</strong> Action is taken in response to patient feedback to improve medicines information distributed by the health service organisation to patients</td>
<td>Developmental</td>
</tr>
</tbody>
</table>
A formalised process of medication reconciliation involving patients and/or family/carers minimises medication errors at transitions of care.

It is a complex process that requires cooperation among health practitioners within, and between, healthcare settings and benefits from the active involvement of patients and carers.

Patients and their families can play a crucial role by keeping an up to date and accurate medicines list, bringing this into hospital along with their medicines containers, being honest about the medicines they are taking and speaking up if they suspect an error has occurred.
Acknowledgements

Armadale Health Service (WA) for their slides
Australian High 5s hospitals

The High 5s Project, established by WHO in 2007, is an international collaboration carried out in seven countries: Australia, Germany, France, the Netherlands, Singapore, Trinidad & Tobago and the United States of America, and coordinated by the WHO Collaborating Centre on Patient Safety, The Joint Commission. Its mission is to facilitate implementation and evaluation of standardized patient safety solutions within a global learning community, to achieve measurable, significant and sustainable reductions in high risk patient safety problems. [www.high5s.org](http://www.high5s.org)
References

3. Rozich JD, Resar RK. *J Clin Outcomes Manage* 2001;8:27-34
Resources are available at
www.safetyandquality.gov.au

or

contact Helen Stark, Senior Project Officer at
helen.stark@safetyandquality.gov.au
Thank you