The High 5s Project
Implementation Guide

Assuring Medication Accuracy at Transitions in Care: Medication Reconciliation

Implementation Guide
Assuring Medication Accuracy at Transitions in Care

Attribution Statement

This work was carried out as part of the High 5s Project set up by the World Health Organization in 2007 and coordinated globally by the WHO Collaborating Centre for Patient Safety, The Joint Commission in the United States of America, with the participation of the following Lead Technical Agencies including: Australian Commission on Safety and Quality in Health Care, Australia; Canadian Patient Safety Institute, Canada and the Institute for Safe Medication Practices Canada, Canada; National Authority for Health- HAS, France, with CEPPRAL (Coordination pour L' Evaluation des pratiques professionnelles en santé en Rhône-Alpes), France, OMEDIT Aquitaine (Observatoire du Medicament, Dispositifs medicaux et Innovation Therapeutique), France (from 2012- 2015) and EVALOR (EVAluation LORraine), France (from 2009-2011); German Agency for Quality in Medicine, Germany and the German Coalition for Patient Safety, Germany; CBO Dutch Institute for Healthcare Improvement, the Netherlands; Singapore Ministry of Health, Singapore; Trinidad and Tobago Ministry of Health, Trinidad & Tobago; Former National Patient Safety Agency, United Kingdom of Great Britain and Northern Ireland; and the Agency for Healthcare Research and Quality, USA.

This work is a part of the High 5s Project which has been supported by the Agency for Healthcare Research and Quality, USA, WHO, and the Commonwealth Fund, USA.

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Patient Story

An elderly woman was admitted to a hospital with a working diagnosis of community-acquired pneumonia. Appropriate antibiotics and symptom management were ordered and commenced. Two days later the patient suffered a myocardial infarction and it was found that a beta-blocker (cardiac medication) had been omitted on admission. This incident occurred because a necessary home medication was unintentionally omitted upon hospital admission.[1]

1. Introduction

This WHO High5s Implementation Guide is intended to assist front line hospital staff and leaders to achieve a smooth and successful implementation of the WHO High 5s Assuring Medication Accuracy at Transition in Care: Medication Reconciliation Standard Operating Protocol (SOP). It will describe the continuing problem of avoidable adverse drug events (ADEs) resulting from poor communication at interfaces of care, and what can be done to reduce the risk of the preventable events. It will then provide tools and support for implementing medication reconciliation and evaluating its impact. It should be used in conjunction with the WHO High5s Medication Reconciliation SOP.

Figure 1:

Up to 67% of patients' prescription medication histories have one or more errors.[5]

ADEs are a leading cause of injury and death in health care systems around the world.[2,3,4] Many of these events occur as a result of poor communication between health professionals and between health professionals and patients and/or carers when care is transferred, such as when patients are admitted to hospital, move between wards and are discharged home to the community or a residential care facility/home.

The process of medication reconciliation is intended to ensure accurate and consistent communication of patient's medication information through transitions of care. Its reach touches every patient and many health care professionals through the entire continuum of care.

Erroneous medication histories can lead to discontinuity of therapy, recommencement of discontinued medicines, inappropriate therapy and failure to detect a medication related problem. Studies have shown 10 – 67% of medication histories taken on admission contain one or more errors.[5] Up to 27% of hospital prescribing errors are attributable to inaccurate or incomplete medication histories on admission to hospital[6] with the omission of a regular medicine being the most common error. Older patients (≥ 65 years) and those taking multiple medicines experience a higher incidence of errors.[7]

Admission to hospital places patients at an increased risk of having a chronic medication discontinued and this risk is greater in patients who have an intensive care unit admission.[8] If these errors are not resolved they can have adverse consequences for the patient during their hospital stay or following discharge from hospital.

Discrepancies also commonly occur at discharge when prescriptions are written and discharge summaries prepared. In a population of patients discharged from an internal medicine service, 23% of the patients experienced an adverse event and 72% of these were medication related[9].

The majority of these errors can be prevented through a formal medication reconciliation process designed to improve the accuracy of medication histories recorded and their use when prescribing. It is a system of

effectively communicating changes to medication regimens to patients and healthcare providers within the patient's circle of care as patients transition through the healthcare system.

Medication reconciliation is a complex process that involves a number of health disciplines. Frequently there is no defined process and even where one exists there is often no one responsible for ensuring the process is successful. Without an effective medication reconciliation process there are increased *opportunities* for error and harm.[10]

Teams around the world have struggled to implement medication reconciliation because it requires system-wide changes in processes that have existed for years. There are several important considerations to be made by any organization prior to beginning:

- Leadership
- Strategy
- Context
- Integration

Leadership: There needs to leadership support at the highest level of the organization and this must be accompanied by adequate resources to support implementation. If there is not committed and visible leadership the beginning of implementation should be delayed. The WHO High5s countries identified the need for committed leadership as fundamental.

Some of the vital functions of leadership relating to Medication reconciliation implementation may include:

- Ensuring medication reconciliation is a specific strategic priority and setting explicit expectations
- Providing the necessary resources and removing barriers

Strategy: Medication reconciliation has the potential to influence almost every patient at every interface of care. It is a major system change which requires organizational strategy and systems thinking. The use of a change strategy is critical to successful implementation and is discussed later in this document.

Context: The context (or environment) in which the medication reconciliation SOP is implemented will influence the success of its implementation. External factors such as health policy, national guidelines and accreditation requirements for medication reconciliation will have an influence, as will the internal factors that are the unique features of the individual health care organization. Factors such as the culture, leadership, size and structure of the organization, the nature of ownership of the intervention and the availability of resources can affect the success of the implementation and should be considered when planning the implementation strategy.

In order to better understand the influence of context in successful quality improvement work it is recommended that leadership and the implementation team review this excellent resource for the project team. See: Health Foundation - Context

Integration: Effective and efficient implementation of a medication reconciliation process requires integration of its steps into existing hospital systems and processes. It must not be considered an "add on" but rather the new and only way of doing business. To consistently achieve an effective medication reconciliation process, organizations need to take a robust approach to implementation that includes:

- multiple, complementary strategies;
- active involvement and effective communication among the multidisciplinary team;
- effective documentation to support communication of information; and
- the active involvement of the patient (or legally designated representative).

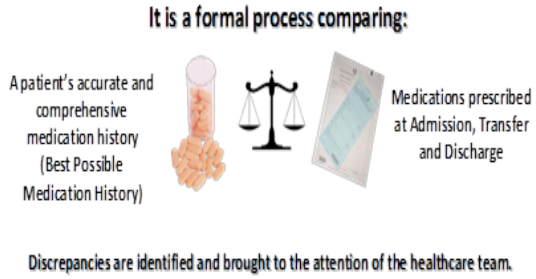
2. Overview of Medication Reconciliation

2.1 What is medication reconciliation?

> Medication reconciliation is the formal process in which health care professionals' partner with patients to ensure accurate and complete medication information transfer at interfaces of care.

Medication reconciliation at admission 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. The BPMH is then used to create admission medication orders, or is compared to admission medication orders in order to identify and resolve any discrepancies. At the end of each episode of care the verified information is transferred to the next care provider and provided to the patient and or family. The process is designed to prevent potential medication errors and adverse events.

Figure 2: Schematic definition of medication reconciliation

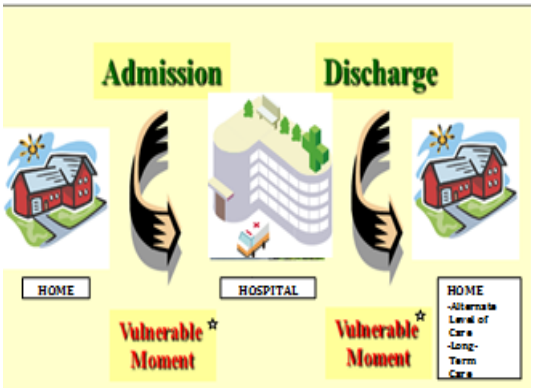


2.2 Where should medication reconciliation take place?

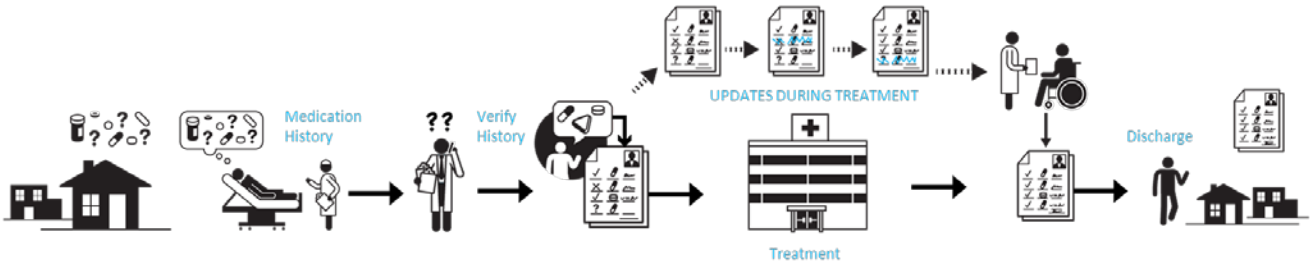
Medication reconciliation should occur at interfaces of care (admission, internal transfer, discharge) and at transitions between facilities such as acute care hospitals, community, or long term care where the patient is at high risk for medication discrepancies. These points in time are sometimes called vulnerable moments. These include:

- Admission to hospital
- Transfer from ED to other care areas (wards, ICU, Home)
- Transfer from ICU to ward
- Discharge from hospital to home, long term care, other hospital
- Visit to primary care provider

Figure 3: Vulnerable Moments Requiring Medication Reconciliation[2]



The following infographics illustrate the process.



2.3 Guiding principles for medication reconciliation

The WHO High5s countries agreed upon several guiding principles that apply to medication reconciliation implementation.

Guiding Principle 1

An up-to-date and accurate patient medication list is essential to ensure safe prescribing in any setting.

The development, maintenance and communication of a complete and accurate medication list throughout the continuum of care - whenever and wherever medications are used - is essential for reducing adverse medication events.

Guiding Principle 2

A formal structured process for reconciling medications operates at all interfaces of care.

Having a structured process for reconciling medications at all points of transfer decreases the risk of communication errors and adverse medication outcomes.

Guiding Principle 3

Medication reconciliation on admission is the foundation for reconciliation throughout the episode of care.

The key to the success of medication reconciliation at all interfaces is to first have a process working effectively at admission to the health care facility. Appropriate admission medication reconciliation is the foundation to support and facilitate efficient and appropriate reconciliation at internal transfers and discharge. It should occur early in admission, preferably within 24 hours of admission.

Guiding Principle 4

The process of medication reconciliation is one of shared accountability with staff aware of their roles and responsibilities.

For medication reconciliation to be effective staff need to be aware of their roles and responsibilities in the process so that patients have their medicines reconciled and discrepancies resolved early within their admission.

Guiding Principle 5

Medication reconciliation is integrated into existing processes for medication management and patient flow.

Effective and efficient implementation of a medication reconciliation process requires integration of its steps into existing hospital systems.

Guiding Principle 6

Patients and families are involved in the medication reconciliation.

Medication reconciliation is most effective when patients and families are engaged in the process.

Guiding Principle 7

Staff responsible for reconciling medications are trained to take a BPMH and reconcile.

Staff responsible for obtaining and recording the BPMH and reconcile medications should have the knowledge, skills and attitudes necessary to safely perform the tasks.

2.4 What is the potential impact of medication reconciliation?

The reconciling process is an effective strategy to reduce medication discrepancies and Adverse Drug Events (ADEs) as patients move through interfaces of care.

- **Systematic Review -** In 2014, a systematic review[11] of the literature evaluated the effectiveness of medication reconciliation in identifying and rectifying harmful discrepancies and medication-related problems across the continuum of care and assessed its impact along with medication review on clinical outcomes (e.g. length of stay, readmissions and mortality). Medication reconciliation identified unintentional medication discrepancies in 3.4% to 98.2% of patients. The evidence demonstrates that medication reconciliation has the potential to identify many medication discrepancies and reduce potential harm. Further research is needed to measure the effect of medication reconciliation on clinical outcomes.
- **Hospital Admission** - In a study that examined how prescribing errors arise on admission to hospital[12], found that despite 100% of the 19 physicians interviewed indicated they would sometimes or always use more than one source of information for a BPMH, a single source was used in 31/68 observed cases. Of 688 medication charts reviewed, 46.2% had errors and 12.8% of these errors were potentially significant.
- **Hospital Admission - Emergency Department.** In a community hospital, Vira and colleagues[13] assessed the potential impact of medication reconciliation in 60 randomly selected patients who were prospectively enrolled at the time of hospital admission. Overall, 60% of the patients had at least one unintended variance (discrepancy) between their admission orders and the medications they were taking at home and 18% had at least one clinically important variance. None of the variances had been detected by usual clinical practice before formal reconciliation was conducted.

- **Hospital Admission – Emergency Department.** van den Bemt et al. observed that across 12 hospitals, the proportion of elderly patients admitted to hospital through the emergency department with one or more unintentional medication discrepancies was reduced from 62% to 32% after the implementation of the medication reconciliation SOP (n=1543)[14].
- **Hospital Admission - General Medicine**. Cornish et al[15] found that 54% of the patients (n= 151, prescribed at least four medications) who were admitted to a general medicine ward in a tertiary care teaching had at least one unintended discrepancy. In this study, 39% of discrepancies were judged to have the potential to cause moderate to severe discomfort or clinical deterioration. The most common discrepancy (46%) consisted of the omission of a regularly used medication.
- **Hospital Admission - Surgery.** Kwan et al.[16] conducted a randomized controlled trial with 464 surgical patients at an acute care teaching hospital. Results demonstrated that multidisciplinary medication reconciliation (pharmacists, nurses and physicians partnering proactively with the patient) in a preadmission clinic resulted in a 50% reduction in the number of patients with discrepancies linked to home medications. Furthermore, the collaborative intervention also resulted in a greater than 50% reduction in the number of patients with discrepancies with the potential to cause possible or probable harm compared to standard of care (29.9% vs. 12.9%).
- **Hospital Discharge.** Forster et al[17] found that 23% of hospitalized internal medicine patients discharged from an acute care teaching hospital experienced an adverse event; 72% were determined to be ADEs.
- **Cost-effectiveness.** Maldonado et al. observed that the introduction of pharmacy services, which included medication reconciliation, into a hospital's kidney transplant team created a statistically significant decrease in the mean length of stay among transplant recipients (from 7.8 days to 3.4 days). The cost savings attributed to this decrease was estimated at $279,180 USD per year[18].
- **Cost--effectiveness.** Karnon and colleagues[19] conducted a model-based cost-effectiveness analysis of interventions aimed at preventing medication errors at hospital admission with medication reconciliation. The aim of the study was to assess the incremental costs and effects (measured as quality adjusted life years) of a range of medication reconciliation interventions. Findings demonstrated that all five interventions, for which evidence of effectiveness was identified, were estimated to be extremely cost effective when compared to the baseline scenario. In this paper, the pharmacist-led reconciliation intervention had the highest expected net benefits and a probability of being cost-effective of over 60% by a quality-adjusted life year value of £ 10 000.

2.5 The business case for medication reconciliation

Since successful implementation of medication reconciliation requires leadership and adequate resources to support the process a strong business case that outlines the financial incentives for the organization and justifies the resources required will help with successful implementation.

The Dutch Inspectorate of Health said the following…

"The WHO is working on improvement of medication reconciliation in the WHO High5s to improve patient safety. Via this project in the Netherlands with support of CBO Dutch Institute for Quality Improvement, in 15 hospitals there was a 75% reduction of discrepancies in the medication history by adopting the SOP. Commitment on this topic is definitely worth it. Due to the necessary deployment of extra staff, hospitals appear quite often to actually carry out medication reconciliation. However, investment in this staff pays for itself quickly. **Medication wrongly given or not given when necessary, therefore, leads to the patient and thereby to the hospital to undesirable situations and thereby to greater costs."**[20]

ADEs have been estimated to cost between $4,500 to $38,000 USD[21] per event. A Canadian study that reviewed published literature for economically attractive patient safety improvement strategies found that pharmacist-led medication reconciliation led to improved safety at a lower cost than when compared to no medication reconciliation strategy.[22] Notably, many business cases focus on the cost benefits derived from the prevention of ADEs. However, additional potential benefits of medication reconciliation should also be considered such as:

- Decrease in readmissions or visits to emergency.
- Decrease in legal costs associated with ADEs.
- Increased efficiencies due to streamlined processes.
- Increased patient engagement and potentially patient satisfaction.
- Increased staff satisfaction.

Examples of resources to assist health services build the business case for medication reconciliation are listed in Appendix L.

3. Who should be involved in Medication Reconciliation?

3.1 Health Professionals

The medication reconciliation process is a shared responsibility of interdisciplinary health care professionals in collaboration with patients and families. Medication reconciliation requires a team approach including prescribers, pharmacists, nurses, pharmacy technicians and other health care professionals. It requires additional training for key clinicians involved. The actual roles and responsibilities for each discipline and clinician are based on the team's local medication reconciliation practice model which takes into account available staffing resources. Effective models will differ from hospital to hospital and within a hospital from team to team. Refer to section 4.3 'Who should complete the BPMH' for further information.

Figure 4: Patient & Multi-Disciplinary Interfaces in Medication Information Transfer Process

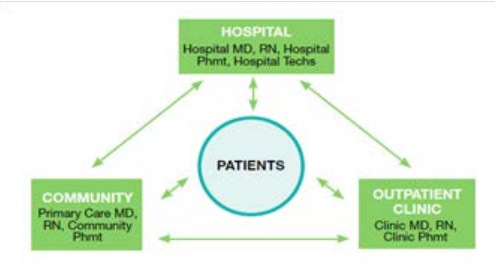


Figure 4 reference[23]: Reprinted with permission from Pharmacy Practice, Vol. 25, No. 6.

3.2 Patient Involvement in Medication Reconciliation

Patients are the only constant factor in the process as they move throughout the healthcare system and medication reconciliation works best when patients and families are actively involved in the process. They are in the best position to provide up-to-date information about the medications they take and how they are taken.

Patients and families are the central resource to communicate their own personal medication-taking practices and assist by providing medication containers, lists and information.[24]

Patients should be educated about the importance of:

- Keeping an up-to date list of their medications and/or bringing in their medications when they are admitted to hospital or attend pre-admission and outpatient clinics
- Providing their medication list at each encounter with a healthcare provider.
- Speaking up if they believe that a mistake has been made with their medicines

Patient engagement education materials

- Posters
- Brochures
- Newsletters
- Videos
- Medication bags
- Information sheets.

Tools to support maintenance of medication lists

- Medication list templates
- Medication list "apps"
- Web-based patient accessible charts or medical records
- Self-service automated medication history collection kiosks
- Healthcare provider facilitation (e.g. community pharmacy-based medication review programs

This can be done through the use of educational materials and tools to support patient self- directed maintenance of medication lists. (See box.) Examples of education resources and tools to engage patients are provided in the medication reconciliation SOP and in Appendix L.

Patients should also be engaged in other steps of the medication reconciliation process (beyond the BPMH collection). They should be informed of any changes made to their medication regimen and have a clear understanding of how to take the medication on an ongoing basis. At interfaces such as discharge from acute care (to home) and ambulatory visits where medications have been modified, patients should be counseled and given patient friendly written information on the updated medication regimen. Assessing a patient's understanding of their discharge medication plan is an ideal way to inform improvements to the discharge medication reconciliation process.

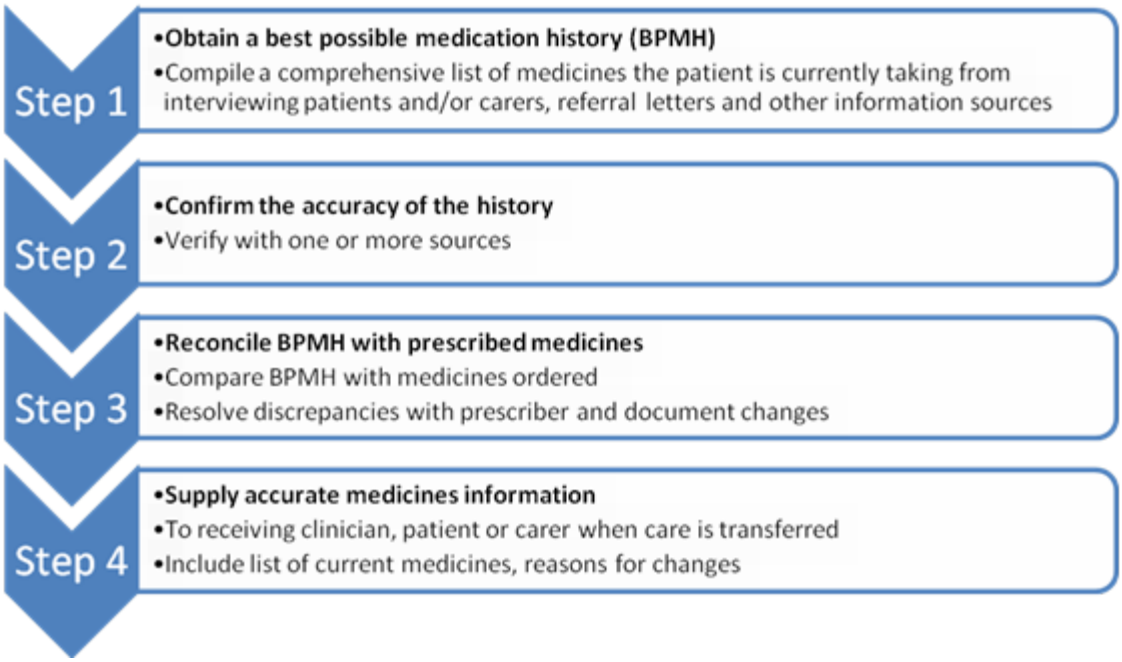
Lessons Learned:

- All patients and/or family should be interviewed within 24 hours wherever possible.
- Relevant information is best gathered prior to the interview e.g. patient's age, cognitive function, social background, medicine containers, medication lists, GP referral letters.
- Interpreters are used if patient and/or carer does not speak the native language.
- Patients should be encouraged to bring their medicine containers and/or a current medicines list to hospital, pre-admission clinics, hospital appointments.
- Patients and/or carers should be informed of any new medicines commenced and changes to medicines prior to discharge.
- Patients and/or family should be encouraged to keep an up-to-date list of medicines and show it to their health care providers at each new encounter.

4. Medication Reconciliation at Admission and the BPMH

There are four steps in the medication reconciliation process at admission. See Figure 5

Figure 5: Steps in the medication reconciliation process on hospital admission



A **Best Possible Medication History (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.

Types of medication to be noted on the BPMH include:

A. ALL prescribed (medications the patient is instructed to take by the prescriber)
B. ALL non-prescribed (the prescriber did not advise the patient to take the medication)
C. ALL non-prescription (e.g., over-the counter (OTC) or herbal medication)
D. ALL recreational and 'prn' (i.e., "as needed") medications required by patient

Figure 6: Medication History

Figure 7: Types of medication

Prescribed (medications the patient is instructed to take by the prescriber)

Non-prescribed (the prescriber did not advise the patient to take the medication.

Non-prescription (e.g., over the counter (OTC) or herbal medication)

Recreational

PRN (i.e., "as needed" medications required by patient)

4.1 How to Obtain the Best Possible Medication History (BPMH)

The BPMH is different and more comprehensive than a routine primary medication history (which is often a quick patient medication history taken without all information available).

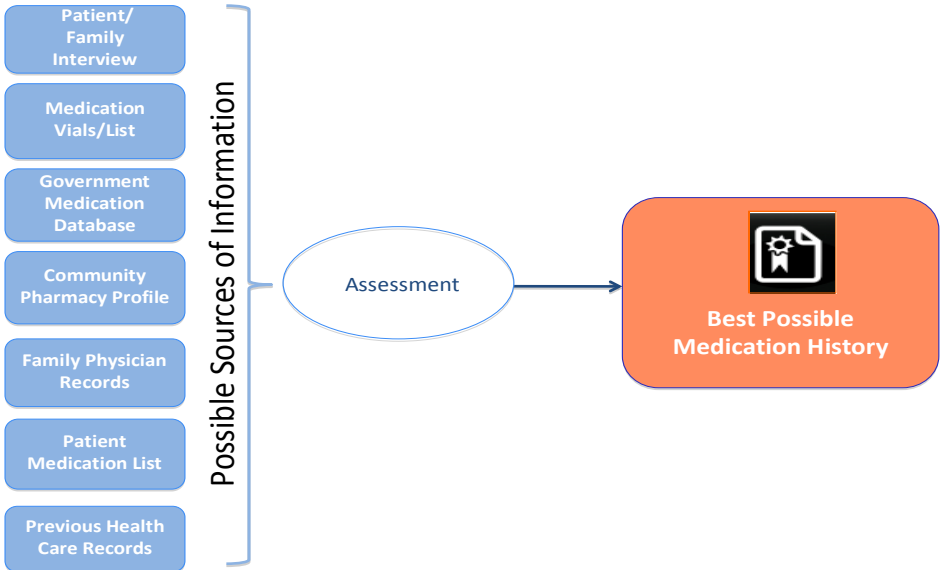
Creating the BPMH should involve using a **systematic process** for obtaining a medication history, verifying medication information with more than one source as appropriate:

1. Patient/family medication interview where possible.
2. Other sources of information include:
   a. contacting community pharmacists, physicians and/or home care providers
   b. inspection of medication vials/patient medication lists
   c. government medication database
   d. previous patient health records

For patients who present prescription bottles and/or a medication list, each individual medication and how the patient actually takes it should be verified, if possible. Frequently, patients take medications differently than what is reflected on the prescription label.

The BPMH is a record of medication information that includes: medication name, dose, frequency and route of administration of medications. It is a 'snapshot' of the patient's actual medication use, even though it may be different from what was prescribed. Using tools such as a guide to gather the BPMH may be helpful for accuracy and efficiency. (See Appendix A: Top Ten Practical Tips)

Figure 8 – Possible Sources of Information Which May Be Used To Create the Best Possible Medication History



Examples of medication history interview guides and tools are provided in appendix B

4.2 When should the BPMH be completed?

It is ideal to have the BPMH completed and discrepancies identified and communicated to the prescriber within 24 hours of the decision to admit the patient. It should be noted that formal medication reconciliation after 24 hours, although not optimal, will benefit the patient.

4.3 Who should complete the BPMH?

To the extent possible, pharmacist staff should be involved in gathering/validating and/or reconciling the patient's list of current medications (BPMH) and the comparison of that list with medication orders. When pharmacy staff is not available, those tasks should be undertaken by a trained health care provider (physician, nurse, therapist, or technician), based on the individual's qualifications for the tasks. Since pharmacists are frequently a limited resource, many countries and organizations have trained pharmacy technicians in the process of collecting the BPMH. During the WHO High5s project, the Netherlands published a study about successful medication reconciliation implementation where pharmacy technicians successfully collected the BPMH.[14]

Health Care providers completing the BPMH should:

1. Receive **formal training** about medication reconciliation on how to complete a BPMH
2. Follow a **systematic process** using a BPMH interview guide where possible.
3. Be **conscientious, responsible and accountable for conducting the medication history process**. If they are unsure of a medication, they should take the time to check a resource to ensure it is recorded accurately (medication name, dose and frequency).

Also see section 8 on Education and Training (page 26).

Lessons Leaned:

1. Implementation of the SOP was most successful when a pharmacist (or pharmacy staff) was available to perform the medication reconciliation.
2. Pharmacists and pharmacy technicians tended to produce timely and accurate BPMHs.
3. Limited pharmacy resources tended to be the chief limiting factor for implementation.

4.4 Where should the BPMH be documented?

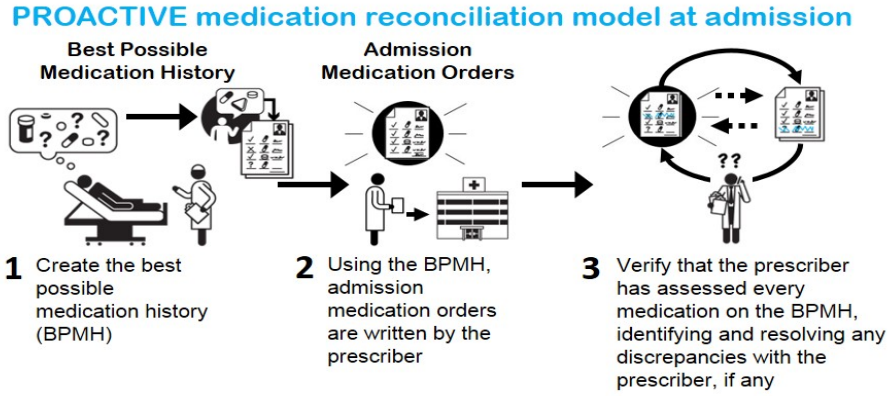
Once the BPMH is developed, it is documented in a paper-based or electronic format and placed in a highly visible central location for all health care professionals to access. See examples provided in Appendix E.

4.5 Process for admission medication reconciliation

The collection of the BPMH is the first step in the reconciliation process. Admission medication reconciliation processes generally fit into two models: the proactive process, the retroactive process or a combination of the two.

The proactive process occurs when the BPMH is created prior to writing admission medication orders.

Figure 9 – Proactive medication reconciliation model at admission

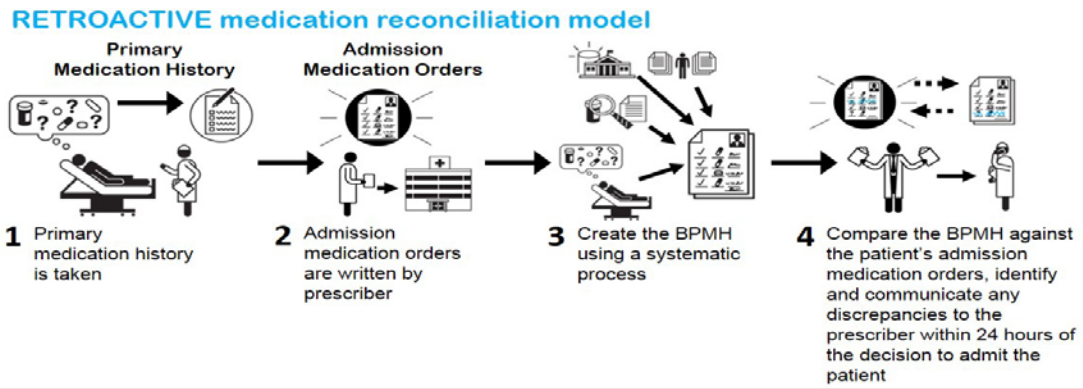


The BPMH is created and documented upon patient arrival/decision to admit the patient and is used by the prescriber to write the admission medication orders (AMO). Sometimes paper based or electronic tools are created to document the BPMH and lead to medication orders by providing room for the prescriber to indicate whether the medications should be continued, discontinued or modified. (See Appendix E – Sample Admission Medication Order Forms.

This process depends on the BPMH being conducted before admission orders are written. In situations such as: inadequate staffing to perform a BPMH, medical status of the patient, complex patients with extensive medication histories, or incomplete information available to complete a BPMH prior to the AMO; a process should be in place to reconcile the AMOs to the BPMH within 24 hours of the decision to admit the patient (this is the retroactive process).

A retroactive process at admission occurs when a BPMH along with formal admission reconciliation occurs after admission medication orders are written.

Figure 10 – Retroactive medication reconciliation model



Lessons Learned

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

5. Identifying and Resolving Discrepancies

Discrepancies found between admission medication orders and the BPMH can be divided into three main categories:

1. Intentional
2. Undocumented intentional
3. Unintentional.

5.1 Intentional discrepancies are clinically understandable and appropriate discrepancies between the BPMH and the admission orders based on the patient's plan of care. The prescriber has made an intentional choice to add, change or discontinue a medication and their choice is clearly documented. Intentional discrepancies include new medication orders prescribed for the first time based on the patient's diagnosis or clinical status. (See Appendix E – Sample Admission Medication Order Form (BPMH Leading to Orders)).

> *Intentional Discrepancy: For example, a patient is admitted with pneumonia and started on IV antibiotic which they were not on at home. This is clearly documented on the chart and is an intentional discrepancy. Or, a patient was on an herbal supplement and this supplement was discontinued by the prescriber due to a drug-drug interaction with a blood thinner and this was clearly documented.*

5.2 An undocumented intentional discrepancy is one in which the prescriber has made an intentional choice to add, change or discontinue a medication but this choice is not clearly documented. Any orders which need clarification with the prescriber or may be confusing to other clinicians caring for the patient but are intentional, are considered undocumented intentional discrepancies.

Undocumented intentional discrepancies are a failure to document. They are not medication errors and do not usually represent an immediate threat to patient safety. However, undocumented intentional discrepancies may lead to confusion, require extra clarification and may lead to medication errors. They can be reduced by standardizing the method for documenting admission medication orders.

> *Undocumented intentional discrepancy: For example, patient was on an antihypertensive medication at home, but the patient's surgeon did not order the anti-hypertensive medication upon admission due to concerns about preoperative hypotension; however the reason for not ordering the antihypertensive medication was not documented in the medication record.*

5.3 An unintentional discrepancy is one in which the prescriber unintentionally changed, added or omitted a medication the patient was taking prior to admission. Unintentional discrepancies have the potential to become medication errors that may lead to adverse events. Unintentional discrepancies fall into 2 main categories: omission *and commission.*

Table 1: Examples of two types of unintentional discrepancies:

Type of unintentional discrepancy	**Description**	**Example**
Omission:	Patient was not ordered a pre-admission medication. There is no clinical explanation or documentation for the omission.	*A patient was on aspirin at home but it was not ordered on admission. When the clinician clarifies with the prescriber, it is evident that the prescriber was not aware that the patient was on this medication. A clarification order was written to restart the patient's aspirin 100 mg po daily.*
Commission	Incorrect addition of a medication not part of the patient's pre-admission medication and there is no clinical explanation or documentation for adding the medication to the patient's therapy.	*A patient was on a blood pressure medication at home but it was discontinued by the family prescriber 2 months ago. The blood pressure pill was brought in with the patient's other medications and inadvertently ordered upon admission. Clarification with the prescriber reveals that the prescriber was not aware of the recent discontinuation of the medication and an order was written to discontinue the medication.*
	Different dosage, route or frequency of a medication than what the patient reports taking before hospitalisation is ordered at admission. The differences are not explained by changes in the patient's clinical status at admission such as renal or hepatic function.	*A patient is on levothyroxine 0.025 mg po daily at home however, upon admission the orders are for levothyroxine 0.25 mg po daily. Clarification with the prescriber reveals that this was an unintentional discrepancy and a clarification order was written to correct the dose.*

In order to determine whether the discrepancy is undocumented intentional or unintentional, it may be necessary to clarify the information. The clarification may be done either in person or electronic/paper communication. If the discrepancy was intentional, then the proper documentation is required on the chart. If the discrepancy is unintentional, then the prescriber can resolve the discrepancy by writing a new order.

6. Medication Reconciliation at Internal Transfer

Internal transfer is an interface of care associated with a change in patient status where medications are assessed and medication orders should be reviewed and updated.

Internal transfer may include:

a) Change in responsible medical service
b) Change in level of care (critical care unit to hospital ward)
c) Post-operative transfer and/or
d) Internal Transfer between units

The goal of internal transfer is to ensure all medications are appropriate for the patient's new status of care. Internal transfer medication reconciliation involves assessing and accounting for:

- the medications the patient is taking prior to admission (BPMH)
- the medication list from the transferring unit: medication administration record (MAR, paper or electronic), medication chart
- the new post-transfer medication orders (includes new, discontinued and changed medications upon internal transfer).

Reconciliation ensures that changes are intentional and that discrepancies are identified and resolved. This should result in avoidance of therapeutic duplications, omissions, unnecessary medications and confusion.

Reconciliation at transfer can be a paper-based or a computerized process depending on available systems within the hospital. Many hospitals, either through the pharmacy computer system or computerized prescriber order entry (CPOE) system, may have the capability to electronically generate a current medication list at the time of transfer that allows the prescriber to select the medications they would like to continue or modify for the next level of care. However, these systems do not generally have a mechanism for addressing pre-hospital medications and a separate process may be needed to ensure that this type of reconciliation occurs.

At the time of transfer, it is also important for the prescriber to make decisions about the appropriateness of continuing existing hospital medications, as well as assessing the need to resume or discontinue pre-hospital medications.

> *For example, a patient on an intravenous inotrope in the intensive care unit may not be able to continue on the medication when transferred to a medical ward due to lack of monitoring devices and hospital policy.*
>
> *Another example would be a patient whose pain is improving post-operatively, may not require a continuous intravenous opioid drip once transferred to the new unit and may be switched to oral analgesics.*

Please refer to process map in Appendix D.

7. Medication Reconciliation at Discharge

Hospital discharge is a critical interface of care where patients are at a high risk of medication discrepancies as they transition out of the hospital.[7]

The goal of discharge medication reconciliation is to reconcile the medications the patient is taking prior to admission (BPMH) and those initiated in hospital, with the medications they should be taking post-discharge to ensure all changes are intentional and that discrepancies are resolved prior to discharge. This should result in avoidance of therapeutic duplications, omissions, unnecessary medications and confusion.

Discharge medication reconciliation clarifies the medications the patient should be taking post-discharge by reviewing:

1. Medications the patient was taking prior to admission (BPMH)
2. Previous 24 hour MAR (medication administration record)
3. New medications planned to start upon discharge

A multidisciplinary, integrated medication reconciliation strategy will reduce medication discrepancies at hospital discharge. This strategy should include tools to support the clinician and patient with discharge reconciliation and should integrate and clarify medication information from all sources. A discharge medication reconciliation form may be developed similar to the admission medication reconciliation form. The final step of discharge reconciliation should be the development and provision of clear and comprehensive information for the patient and community care providers – the Best Possible Medication Discharge Plan (BPMDP).

The **Best Possible Medication Discharge Plan (BPMDP)** is the most appropriate and accurate list of medications the patient should be taking after discharge. It may be electronically generated or paper-based.

Using the Best Possible Medication History (BPMH) and the last 24-hour medication administration record (MAR) as references, create the **Best Possible Medication Discharge Plan (BPMDP)** by evaluating and accounting for:

1. New medications started in hospital
2. Discontinued medications (from BPMH)
3. Adjusted medications (from BPMH)
4. Unchanged medications that are to be continued (from BPMH)
5. Medications held in hospital
6. Non-formulary/formulary adjustments made in hospital
7. New medications started upon discharge
8. Additional comments as appropriate - e.g. status of herbal medications/ supplements or medications to be taken at the patient's discretion

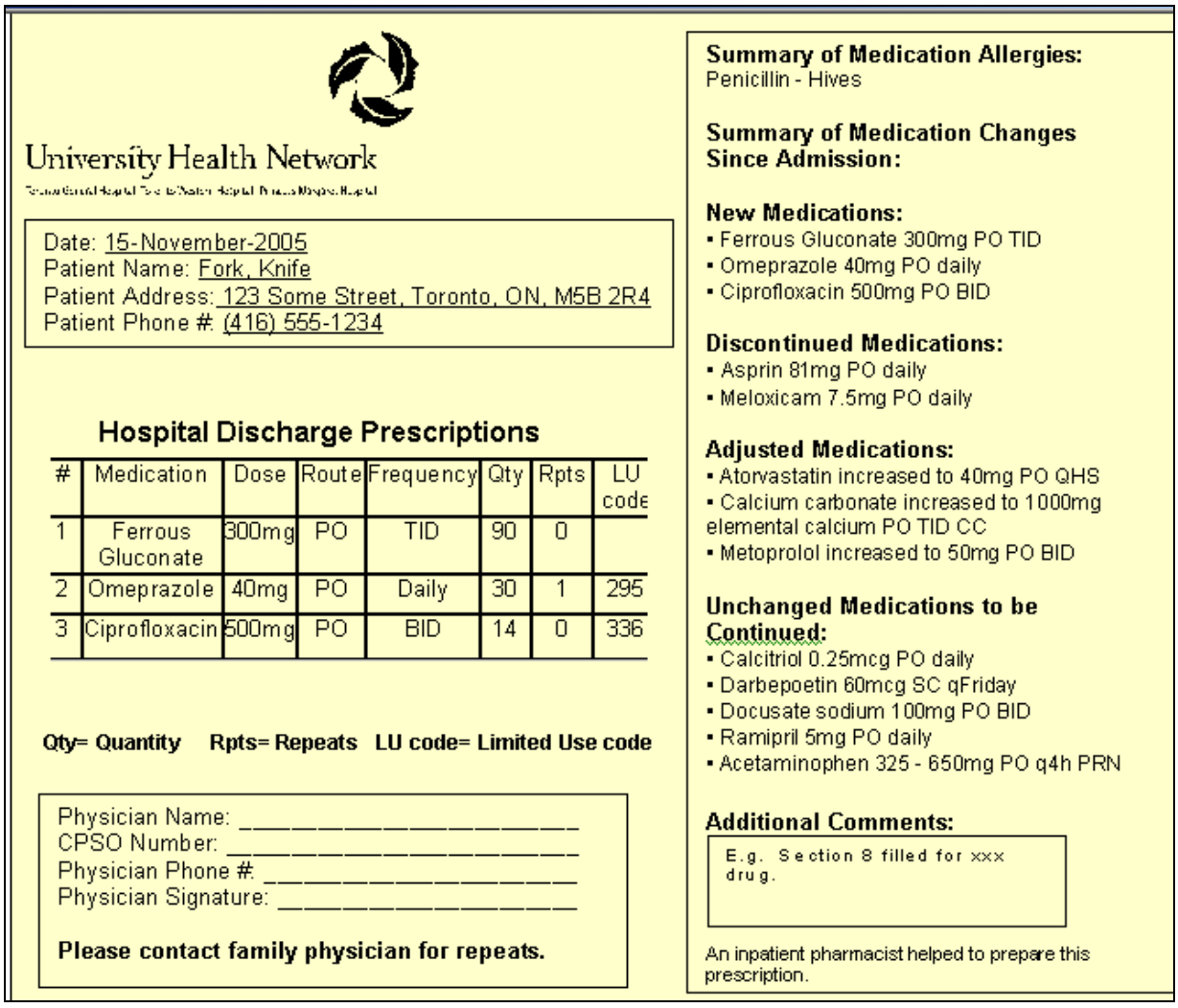
The Best Possible Medication Discharge Plan (BPMDP) should be communicated to the:

- Patient
- Community prescriber/Family physician
- Community pharmacy
- Alternative care facility or service (i.e. long term care institution)

It is essential that the information for the patient or their family is provided in a format that can be understood. Each time a patient moves from one health care facility to another or to home, providers should review with the patient and/or responsible family member the previous medication regimen alongside the list of medications prescribed at discharge and reconcile the differences. This process should take place both prior to leaving the hospital and again promptly after transitioning to the new setting of care. An example of the BPMDP is provided below.

Please refer to process map in Appendix D.

Figure 11 - Example of a Discharge Summary showing the Best Possible Discharge Plan[25]
*Used with Permission



University Health Network

Date: 15-November-2005
Patient Name: Fork, Knife
Patient Address: 123 Some Street, Toronto, ON, M5B 2R4
Patient Phone #: (416) 555-1234

Hospital Discharge Prescriptions

#	Medication	Dose	Route	Frequency	Qty	Rpts	LU code
1	Ferrous Gluconate	300mg	PO	TID	90	0	
2	Omeprazole	40mg	PO	Daily	30	1	295
3	Ciprofloxacin	500mg	PO	BID	14	0	336

Qty= Quantity Rpts= Repeats LU code= Limited Use code

Physician Name: _____
CPSO Number: _____
Physician Phone #: _____
Physician Signature: _____

Please contact family physician for repeats.

Summary of Medication Allergies:
Penicillin - Hives

Summary of Medication Changes Since Admission:

New Medications:
- Ferrous Gluconate 300mg PO TID
- Omeprazole 40mg PO daily
- Ciprofloxacin 500mg PO BID

Discontinued Medications:
- Asprin 81mg PO daily
- Meloxicam 7.5mg PO daily

Adjusted Medications:
- Atorvastatin increased to 40mg PO QHS
- Calcium carbonate increased to 1000mg elemental calcium PO TID CC
- Metoprolol increased to 50mg PO BID

Unchanged Medications to be Continued:
- Calcitriol 0.25mcg PO daily
- Darbepoetin 60mcg SC qFriday
- Docusate sodium 100mg PO BID
- Ramipril 5mg PO daily
- Acetaminophen 325 - 650mg PO q4h PRN

Additional Comments:
E.g. Section 8 filled for xxx drug.

An inpatient pharmacist helped to prepare this prescription.

Lessons Learned:

1. Discrepancies are resolved early in the admission. This will reduce delays on discharge
2. 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)
3. A patient friendly BPMDP should be provided to the patient and family
4. The BPMDP is communicated to the community pharmacy, primary care physician, or alternative care facility or health care team/service that will be providing care to the patient.

Table 2: Medication reconciliation at vulnerable points in transitions of care

Vulnerable points in transitions of care	**Rationale for Medication reconciliation**
Admission to acute facility	To reduce the risk of unintended discrepancies in admission orders, and to ensure that all changes to medication orders on admission are intentional.
Transfer (internal) • From emergency department to wards • From ICU to wards	To reduce the risk of discrepancies and potential unintentional errors when there is a change in service and level of care associated with a change in patient status.
Discharge to: • community, long term care, home • acute care hospital.	To reduce the risk of unintended discrepancies in the discharge information, ensure all the medications taken prior to admission are reconciled with those initiated in hospital and those to be taken post-discharge and an accurate and complete list of medications is provided to the next care provider and patient and/or family.

8. Education and Training of Staff

A comprehensive staff education program is considered one of the key success factors for medication reconciliation.

All staff involved in the medication reconciliation process need to be trained in their areas of responsibility. This requires an ongoing commitment by the organization to:

- training all new staff; and
- providing ongoing training.

Ideally the training should be multidisciplinary as this promotes the team approach, there is an understanding of each discipline's role, and the training is consistent.

Training should focus on two concepts.

1. How to conduct patient interviews to enquire about patient's current medications in order to create the BPMH
2. Critical thinking involved when performing the reconciliation process

The ongoing education of staff is a significant investment for health service organizations. Some of this training should be undertaken by professional organizations and by universities.

There are a number of training resources available to assist organizations with their training needs. See resources in Appendix L.

When initially implementing the medication reconciliation SOP it will be necessary to train large numbers of staff. This can be achieved by using a train the trainer approach.

Lessons Learned:

1. Staff should be 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.
2. All staff with responsibilities for taking medication histories (including primary medication history) are trained in how to take a best possible medication history (BPMH). This includes verifying the history with different information sources to determine what the patient is actually taking.
3. Resources, materials and manpower, are available for training staff on an ongoing basis.
4. A structured form/tab (paper or electronic) is used to record the BPMH that prompts for the information required.

9. Implementing the WHO High5s SOP for Medication Reconciliation

Phased Implementation

Considering the complexity and resource requirements for implementing a comprehensive program of medication reconciliation for all patients across the full continuum of care, a phased implementation is recommended. For maximum patient benefit, hospitals are encouraged to implement medication reconciliation processes for all patients and at all points of transfer and discharge described in the implementation guide, but each hospital should consider whether a specific population will be addressed in the beginning.

Quick-Start Check List — Are You Ready?

The sections that follow lay out the basic strategy for implementing the WHO High5s medication reconciliation SOP.

Theh first step is to determine what needs to be done.

- Who should be involved and what are their roles and responsibilities?
- What is the time line for implemention?
- What are the major milestones and deliverables along the road to full implementation?
- Should a pilot test be done?
- How is a full, successful, and sustainable implementation achieved?

Medication reconciliation is a complex process that involves many professional disciplines in different settings of care—beginning with the arrival of the patient through to discharge. While the basic principles of information-based decision making and communication among team members are generally accepted, the process itself is often highly variable, provider-centered (rather than patient-centered), hierarchical (rather than team-based), and likely will be resisted if not implemented in a systematic manner with appropriate oversight, resources, and early engagement of the participants in the process.

Here is a short check list of pre-implementation activities and necessities that will put you in good position to move forward with a smooth and successful implementation. Each of the following items should be completed as soon as possible and definitely before starting the actual process of implementation:

- ☐ Secure senior leadership commitment
- ☐ Appoint a project coordinator
- ☐ Form an implementation team
- ☐ Confirm availability of team members
- ☐ Convene the team
- ☐ Define the problem and the goals
- ☐ Develop a work plan

It is recommended that a quality improvement approach be taken to implement the medication reconciliation SOP.

Lessons learned

1. Engage frontline staff in revision of medication reconciliation processes and procedures to reduce risk of resistance to any changes.
2. Communicate the benefits of medication reconciliation to each of the disciplines involved.

In the pages that follow, we will go into some detail about each of the items on this check list and the implementation process. Box below lists the key steps for getting started on implementation of medication reconciliation.

1. Secure Senior Leadership Commitment
2. Form a Team
3. Develop a Work Plan
4. Process map current and planned processes
5. Define the Problem
    i. Set Aims (Goals and Objectives)
    ii. Collect Baseline Data
    iii. Submit Baseline Data
6. Start small and build expertise in reconciling medications
7. Evaluate Improvements Being Made – Collect and Monitor Data (see Section 10)
8. Spread throughout the organisation

9.1 Secure senior leadership commitment

Implementing a successful medication reconciliation process requires clear commitment, direction and accountability for outcomes from the highest level of the organization. Visible senior leadership support will help to engage staff, remove obstacles and allocate resources enhancing the ability of teams to implement medication reconciliation.

Actively engage senior leadership by building a business case for medication reconciliation demonstrating the need for adverse drug event prevention and reductions in work and rework. Present progress to senior leadership monthly: present data on errors prevented by the medication reconciliation process; identify resources needed to be successful.

In the case of the WHO High5s, oversight leadership was generally provided by a pharmacy manager with overall support from a senior leader.

Lessons learned

1. Senior executive leadership and support is critical to full and successful implementation of the SOP.
2. Leadership support should be clearly articulated to the entire hospital on an ongoing manner.
3. On site champions are critical to successful implementation.
4. The choice of clinical champions is vital, they must be interested and influential

9.2 Form a team


FORM A TEAM

- A team approach is needed to ensure medication reconciliation is completed successfully. **Teamwork is an integral part of the medication reconciliation process.** Medication reconciliation is not owned by one discipline. Clinical champions can contribute significantly to successful implementation.
- To lead the initiative we recommend the organization identify a multidisciplinary site coordination team to coordinate implementation of medication reconciliation and a smaller team at the patient care unit level to conduct tests of change on that unit.


ENSURE ALL DISCIPLINES & FUNCTIONS ARE REPRESENTED

- Representation on the site coordination team could include:
  - → Senior Administrative leadership (executive sponsor)
  - → Clinical leaders representing physicians, nursing and pharmacy staff
  - → Front line caregivers from key settings of care, and from all shifts
  - → Representatives from other work units or committees whose responsibilities/mandates include the improvement of patient safety (e.g. Patient Safety Officer, representatives from Quality Improvement/Risk Management, Patient Representatives, Pharmacy and Therapeutics committee)
  - → Patient and/or family member
- Patient involvement, including patient interviews, is critical to the medication reconciliation process. The patient is the only constant participant across the system and is critical to the success of this major system change.
- On a patient care unit level a small 'unit team' is helpful to coordinate and initiate tests of change (PDSA cycles) and provide comments to the site coordinating team. Team members could include: unit based physician, nurse manager, frontline nurse, pharmacist and patient. Team members can communicate in a variety of methods including short stand-up meetings on the unit.

Lesson learned
Ongoing communication is important to sustain compliance with the SOP.

9.3 Develop a work plan


DEVELOP A TASK LIST

As in all significant quality improvement initiatives a detailed work plan outlining timelines and responsibilities should be developed and followed.

Lessons learned
1. All the professionals disciplines involved in medication management should be involved in each step of the project work plan.
2. Engage front line staff in planning and revision of medication reconciliation processes to help avoid resistance to change.


ASSIGN RESOURCES


IDENTIFY DEPENDENCIES & CRITICAL PATH

9.4 Process map the current and new processes

IDENTIFY TIME LINE, DELIVERABLES & MILESTONES

Create a simple process flow diagram to outline the current process in place. Note: keep this process simple; its purpose is to identify the sequence of events and who is doing what. High 5's teams found it very beneficial to map current processes and new processes. Some process maps are found in Appendix D.

9.5 Define the problem and collect current state data

DEFINE THE PROBLEM & GOALS

Setting an aim can assist teams to focus on what they are hoping to achieve when implementing medication reconciliation. The aim should be time-specific, measurable and define the specific population of patients who will be affected. As teams work on different points on the continuum of care such as admission, internal transfer and discharge, the aims should be specific to what it is they are hoping to achieve at that point.

See Appendix H: Medication Reconciliation Sample Work Plan and Task List, and Appendix I: Sample Risk Assessment of the Proposed Medication Reconciliation Process.

9.6 Start with small tests of change and build expertise in reconciling medications

- Initially implement a medication reconciliation process on a smaller scale with select groups of patients to develop forms and tools that work in your organization and to gain expertise in the medication reconciliation process.
- Involve staff in the initiative from the planning stage forward.
- Although medication reconciliation should occur at all transition points in care (e.g., admission, transfer, discharge), start at the admission process. If medication reconciliation is not done right at admission, you could be continuing your process using inaccurate information.
- Adapt and test a medication reconciliation form(s). The purpose of these forms is to aid in the collection of a BPMH, to share the information with prescribers, and to facilitate reconciliation (the correction of medication orders and documentation of prescriber decisions). Many institutions adapt a physician's order form for this purpose and a number of forms have been developed by different organizations. The forms will require modifications before use in your institution. As with any changes you make, our recommendation is to test the form first on a small scale and modify as needed. See Appendix E.

Lesson learned
Choose units to pilot the SOP that are interested and have the support of a medication reconciliation clinical champion.

9.7 Spread

- As experience develops and measurement of the success of your medication reconciliation process reflects sustained improvement, the process should be implemented for more patients in more areas. Evaluate at each new step before adding more units to the process. Retest the pilot process on new units in order to identify any revisions that may be needed. The roll-out across an organization requires careful planning to move through each of the major implementation phases.

- A key factor for closing the gap between best practice and common practice is the ability of health care providers and their organizations to spread innovations and new ideas. The IHI's 'A

Framework for Spread: From Local Improvements to System-wide Change' will assist teams to develop, test and implement a system for accelerating improvement by spreading change ideas within and between organizations.[26] This paper will assist teams to "prepare for spread; establish an aim for spread; and develop, execute, and refine a spread plan." Some issues that need to be addressed in planning for spread include training and new skill development, supporting people in new behaviours that reinforce the new practices, problem solving, current culture regarding change, degree of buy-in by staff, and assignment of responsibility.

10. Process Management, Evaluation and Feedback

> *"Data collection and measurement are absolutely necessary for successful implementation (i.e., they helped demonstrate the need for SOP implementation, they provided the implementation team with a tool for demonstrating the impact of implementation efforts, and the act of data collection and measure feedback helped the hospital maintain attention on the patient safety area)."* Medication Reconciliation Lead Technical Agency

10.1 Pre-implementation data collection

Collection of data to describe the "current state" i.e. prior to implementation of the intervention, is helpful for building the case for medication reconciliation as well a as providing a baseline for measuring improvement after medication reconciliation implementation. This data reflects the types of discrepancies that exist **prior** to the implementation of the medication reconciliation process.

How to collect current state (pre medication reconciliation) data
The concurrent method of data collection is used to collect current state data. That is, the audit is undertaken while the patient is in the hospital as opposed to a retrospective audit of patient charts of those admitted in previous weeks or months.

Process for current state data collection

1. Allow the normal process of taking a primary medication history (PMH) to occur. Using the facility's established process, obtain the admission medication orders.
2. Obtain a BPMH using a systematic process.
3. Identify any discrepancies by comparing the admission medication orders with the BPMH.
4. Clarify discrepancies with the most responsible physician to determine which are undocumented intentional and which are unintentional.
5. Calculate the mean number of unintentional discrepancies per patient and number of patients with at least one unintentional discrepancy using the measures described below in Section 10.3 (WHO High5s Admission Medication Reconciliation Measures).
6. A minimum of one measurement period of a random sample of at least 30 patient charts can serve as baseline data.

10.2 Evaluating the new process during and after implementation

EVALUATE THE PROCESS OF IMPLEMENTING THE SOP

Quality improvement measures should be used to evaluate the process and impact of implementing medication reconciliation. These should include measures of the extent to which medication reconciliation is performed and the quality of the process.

When the measures show evidence of "drifting", data should be analyzed to identify the reasons and to determine an appropriate response – for example additional training, redesign or technical support.

It is important to measure medication reconciliation across the organization even though measurement may be staged and occur on one ward or unit at a time. In the beginning data should be collected monthly, once the target is reached and the process is stable the data for the measures can be collected intermittently e.g. six monthly. Data collection should become a routine process in order to ensure that the process is working reliably.

Three core measures were identified during the WHO High5s project as being useful on an ongoing basis. These are listed in the table below. Each organization should identify, test and establish the measures that tell them whether their process is working reliably.

Description of Core Measures used in High 5s Project
MR 1. Percent of Patients with Medications Reconciled within 24 hours of the decision to admit the patient (on admission)
MR 2. The Mean Number of Outstanding Unintentional Medication Discrepancies Per Patient
MR 3. Percent of Patients With at Least One Outstanding Unintentional Discrepancy

The population for the performance measures (the "eligible patient population") should be aligned with the scope of the SOP implementation chosen by the organization. For the WHO High5s project the eligible population was patients 65 year of age and over admitted through an emergency ward to inpatient service.

10.3 WHO High5s Admission Medication Reconciliation measures

MR 1. Percent of Patients with Medications Reconciled within 24 hours of the Decision to Admit the Patient

$$= \frac{\text{Number of eligible patients receiving medication reconciliation within 24 hours}}{\text{Number of eligible patients admitted}} \times 100$$

This is a process measure to determine the degree to which medication reconciliation is performed and to evaluate whether the system is performing as planned. (Eligibility is defined by the healthcare organization).

The goal of this process is to move toward having as close to 100% of eligible patients reconciled upon admission as possible. The SOP process requires the creation of the BPMH, identification of discrepancies between the BPMH and admission orders and communication of any discrepancies to the prescriber within 24 hours of the decision to admit.

Practical Value: This measure allows teams to gauge their capacity to reach as many eligible patients as possible. While the next two measures focus on quality of reconciliation, this measure focuses on capacity.

☆ "Within 24 hours" applies to patients for whom the BPMH has been completed and any discrepancies between the BPMH and admission orders have been identified and communicated to the prescriber within 24 hours of the decision to admit the patient (this may be referred to as "on admission"). Teams should aim to complete medication reconciliation on admission within 24 hours. Prompt reconciliation means potential harm is averted and not perpetuated. It should be noted that formal medication reconciliation after 24 hours, although not optimal, will benefit the patient

Sampling Criteria

- For hospitals with greater than 50 eligible patients per month, the sample size should be at least 30 charts from eligible patients who have had medication reconciliation within 24 hours, or the timeframe established by the institution.
- For smaller hospitals with less than 50 eligible patients per month, the sample will include ALL eligible patients admitted that month.

Quality Measures - MR2 and MR3

It is important to distinguish between the **medication reconciliation process** and the **measurement process**. Two quality measures were used in the WHO High5s project and they were aimed at the overall verification of the quality of the team's medication reconciliation process. They are based on the principles of an *independent double check process* **AFTER the process of medication reconciliation is complete**.

The aim is to measure the quality of the medication reconciliation (accuracy and completeness) by auditing a random sample of charts of patients whose medications have been reconciled. The audit should be conducted by an independent staff member experienced in performing medication reconciliation – the independent observer. The role of the independent observer is to identify whether there were any outstanding discrepancies after the initial process of medication reconciliation occurred.

The independent observer compares the existing BPMH and any readily available sources medication information (e.g. primary histories, nursing home MAR/medication chart, and community pharmacy list) to admission orders and ensures all discrepancies were identified by the professional(s) that completed medication reconciliation. If the discrepancies are in the process of being resolved, (the clinician has already brought the discrepancy to the attention of the prescriber), they are not counted as outstanding. Since the independent observer will be reviewing charts that were reconciled by the team, they will not have to repeat the BPMH process but can clarify any specific issues with the team or patient if necessary). See Appendix C: Examples of Outstanding Medication Discrepancies Identified by the Independent Observer before conducting the first audit.

MR2. The Mean Number of Outstanding Unintentional Medication Discrepancies per Patient

$$= \frac{\text{Number of outstanding unintentional discrepancies}}{\text{Number of eligible patients*}}$$

* refers to all eligible patients (in a random sample of at least 30 patients) who have received formal medication reconciliation within 24 hours of admission

Practical Value: This is a measure of non-intentional discrepancies that include errors of omission, commission and description. If unresolved, this category of discrepancies can lead to actual adverse drug events. It applies to outstanding discrepancies identified by the independent observer not previously found by the medication reconciliation team. In order to categorize the discrepancy, the independent observer may need to discuss the discrepancy with either the medication reconciliation team or the prescriber.

The aim of effective reconciliation is to reduce the number of unintentional discrepancies to a minimum. A practical success target for teams to aim for is 1) a relative target of 75% improvement from baseline or 2) an absolute target of 0.3 unintentional discrepancies per patient.

MR 3. Percent of Patients with at Least One Outstanding Unintentional Discrepancy

$$= \frac{\text{Number of patients with at least one outstanding unintentional discrepancy} \times 100}{\text{Number of eligible patients *}}$$

* refers to a random sample of at least 30 patients who have received formal medication reconciliation within 24 hours of admission

Practical Value: This measure is a "patient-focused" measure that allows teams to translate the impact of the medication reconciliation intervention into practical meaningful and understandable terms to patients and other professionals. For example, a team may find that at baseline, 40% of patients have at least one outstanding discrepancy. After early implementation, this team may find they are able to reduce the magnitude of patients experiencing a discrepancy from 40% to 10% of all admitted patients. The aim of effective reconciliation is to reduce the percentage of patients with at least one outstanding unintentional discrepancy to a minimum.

Summary of the process to collect data for MR2 and MR3

1. Compare the BPMH + other sources of medication information for eligible patients who have had medication reconciliation (e.g. primary histories, nursing home medication records, community pharmacy lists) to the admission medication orders.

2. The independent observer will document and count any outstanding discrepancies not previously found by the medication reconciliation team. (See Appendix C: Examples of Outstanding Medication Discrepancies Identified by the Independent Observer)

3. The total number of outstanding unintentional discrepancies are added and entered into the sample independent observer worksheet which is used to calculate the mean number of outstanding unintentional discrepancies (See Appendix J: Sample Measurement Logs and Worksheets)

4. If at least one outstanding unintentional discrepancy is identified, box D will be checked off as Yes. The total number of patients in the sample with a Yes in box D will be used to calculate the % of patients with at least one outstanding unintentional discrepancy.

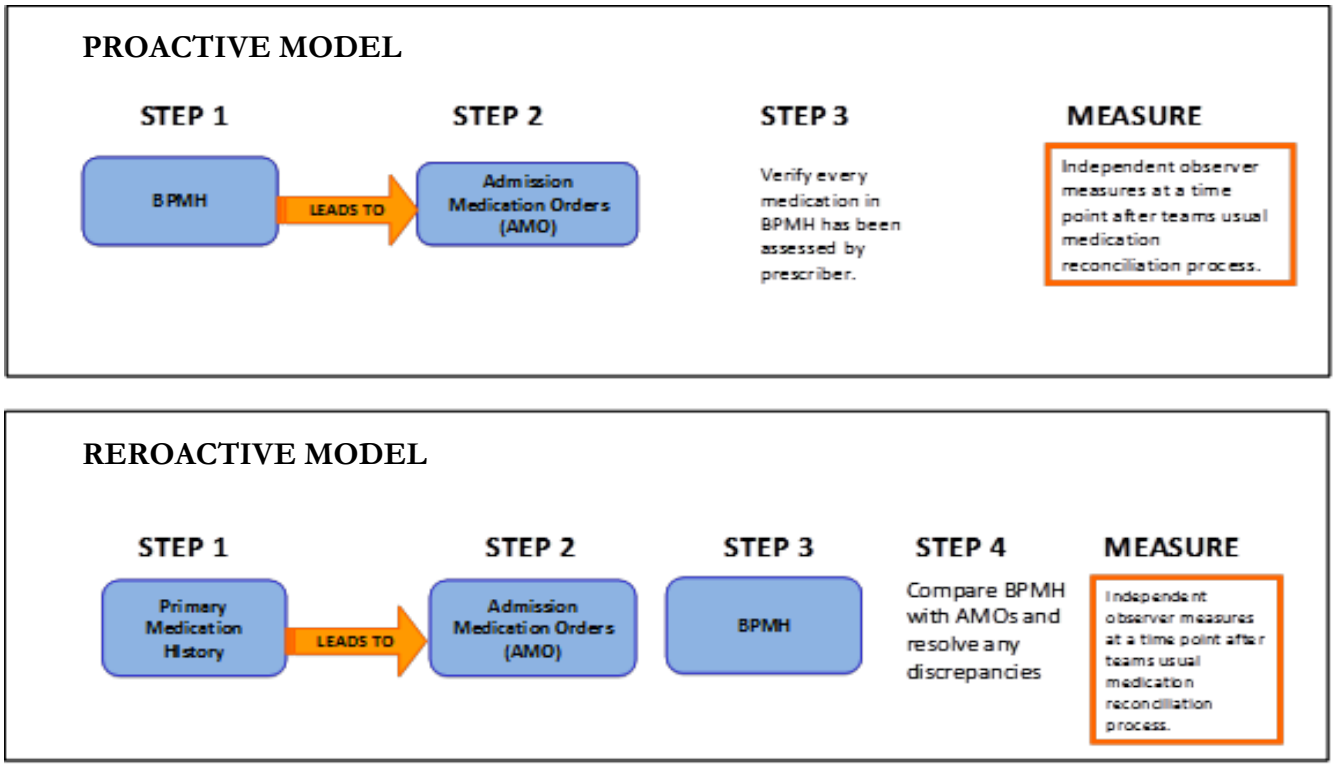
Outstanding Discrepancies =

Medication discrepancies which are identified by the independent observer.
It does not include medication discrepancies identified by the team or medication discrepancies in the process of being resolved.

10.4 When should the measurement take place?

It is important that measurement for MR3 (% of patients with at least one outstanding discrepancy) take place for either the proactive and retroactive medication reconciliation model at a time after the usual medication reconciliation process has been conducted by the team.

Figure 14 – Measurement for the Proactive and Retroactive Model



10.5 Concurrent vs. Retrospective audits

Concurrent audit means doing the audit at the time the patient is admitted. A retrospective audit is done for those admitted in previous weeks or months, after the patient has been discharged. Different measures may be audited concurrently or retrospectively.

Retrospective measurement for MR1: % of Patients with Medications Reconciled within 24 hours of the Decision to Admit the Patient:

- This measurement may be done retrospectively at the end of each month. Facilities may have an electronic means to capture the data by running a report of patients who have had medication reconciliation completed in 24 hours otherwise the data can be collected reviewing by reviewing charts of discharged patients. If sampling is utilized the minimum number of eligible cases per month is 50 or all patients if less than 50 patients are admitted.

Concurrent measurement of MR2 and MR3 - patients with outstanding discrepancies:

- In the interest of patient safety, the independent observer must feel empowered to intervene if discrepancies are identified or be able to refer the discrepancy to the medication reconciliation team for resolution of the discrepancy. Discrepancies identified and/or resolved by the independent observer are counted as outstanding discrepancies.
- Concurrent audits identify patients "at risk" of experiencing an adverse event from a discrepancy and immediate actions for improvement can be made. Concurrent audits also make it easier to distinguish intentional from unintentional discrepancies as discrepancies can be clarified with the prescriber at the time.

- The purpose of the independent observer is to ensure all medication discrepancies have been identified or are in the process of being resolved.
- Retrospective audits are not ideal for the purposes of these measures

10.6 Who conducts the audit?

An **independent observer** who is familiar with the medication reconciliation process and how to obtain a BPMH should be designated to conduct the audit. This person should be different from the clinician who has done the medication reconciliation. **The purpose of the independent observer is to ensure all medication discrepancies have been identified or are in the process of being resolved.** The independent observer can be a clinician (i.e. nurse, pharmacist, physician, patient safety representative or researcher or quality improvement staff member). Ideally, this individual should not be responsible for routine operations in the clinical area under review.

The independent observer should **only assess patients who have received formal reconciliation** in the timeframe determined by the organization**.**

10.7 For what period of time should measurement be performed?

In order to be successful over time, organizations should continue to analyse, revise and report data on the success and quality of medication reconciliation implementation.

It is recommended that teams should continue to measure until they have achieved and sustained a target goal for MR3 the mean number of outstanding unintentional discrepancies per patient for three consecutive months at which time the measurement frequency can be reduced every 6 months.

A practical target goal is:

1. a *relative target* of 75% improvement from the team's baseline data (unintentional discrepancies) or
2. an *absolute target* of 0.3 unintentional discrepancies per patient.

Sites with a well-established process and low rates should establish their own specific targets.

In the interest of standardized measurement when collecting data to measure the success of medication reconciliation it is suggested that teams operate with the following guidelines.

1. Assess each medication for consistency of drug, dose, frequency, and route
   a. These are counts of medications, not doses administered. For example, if there is a discrepancy with a medication that is administered 5 times a day, this is counted as one discrepancy, not five.
   b. If the total daily dose does not change despite frequency or timing of administration change it is NOT a discrepancy. For example, Lasix 20 mg bid changed to 40 mg daily (total daily dose administered at one time).
   c. If the route changes for clinical reasons it is not a discrepancy. For example, if furosemide po is switched to IV.
2. Blood products and IV solutions are not included in medication reconciliation.
3. When there is confusing information regarding medications a patient is taking on admission, the clinical pharmacist (or other qualified professional) will make decisions based on the best available information.

Other Measures

Health care organizations may use additional measures to evaluate improvement. Additional information collected by WHO High5s hospitals included:

- Number and type of discrepancies intercepted and corrected by medication reconciliation
- Number of discrepancies remaining unresolved 48 hours after admission
- Clinical significance of discrepancies.

10.8 Measuring progress over time using Run Charts

Teams are encouraged to use Run Charts to illustrate observation of patterns of improvement over time. Run charts are graphs of data over time and are one of the single most important tools in performance improvement.

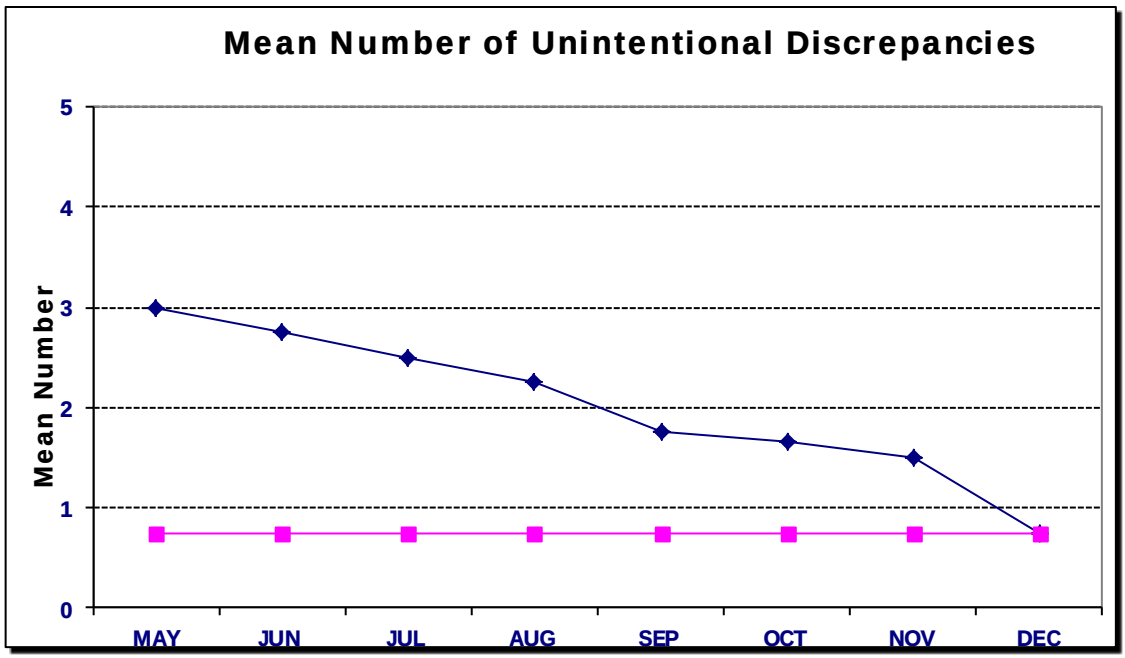
Using run charts has a variety of benefits:

→ Run charts help improvement teams formulate aims by depicting how well (or poorly) a process is performing.

→ They help in determining when changes are truly improvements by displaying a pattern of data that you can observe as you make changes.

→ Run charts give information about the effectiveness of particular changes and provide direction as you work on improvement and information about the value of particular changes

Sample Run Chart



Lessons Learned

1. Data collection for measurement is burdensome but necessary and integrating data collection into processes of care reduces the burden.
2. Collecting baseline data on discrepancies prior to medication reconciliation implementation is helpful in building the case for change.
3. Setting a target for reduction in discrepancies is useful.
4. Measuring the data monthly initially, and reducing to six monthly when the target is met and process is stable reduces the burden of data collection Seek usefulness, not perfection. Remember, measurement is not the goal; improvement is the goal. In order to move forward to the next step, a team needs just enough data to know whether changes are leading to improvement.
5. Integrate measurement into the daily routine. Look for existing sources of data within your organization.
6. Useful data is often easy to obtain without relying on information systems. Don't wait two months to receive data from your hospital's information systems department. Develop a simple data collection form, and make collecting the data part of someone's job. Often, a few simple measures will yield all the information you need.
7. Use qualitative and quantitative data. In addition to collecting quantitative data, be sure to collect qualitative data, which often are easier to access and highly informative. For example, collecting and sharing case studies describing errors you have intercepted can be a powerful tool to obtain stakeholder involvement. Ask staff how the medication reconciliation process is going or how to improve the medication reconciliation or BPMH form. Or, in order to focus your efforts on improving a patient's ability to provide a complete and accurate medication history, ask patients and their families about their experience.
8. Data from the performance measures on improvements gained should be fed back to executive and staff.
9. Feedback to staff on discrepancies identified and harm avoided by the medication reconciliation process is useful.
10. Additional measures were useful for demonstrating the importance of the SOP to decision makers, especially the number of identified discrepancies remaining unresolved at 48 hours following admission.

11. Optimization of Your SOP Process: Event Analysis

Event analysis can be used as an intervention to optimize the implementation of the SOP. It may not be possible to analyze all events, but the process of event analysis will assist to assess the success and reliability of implementation. Who does event analysis is important and any event analysis involving medications should involve a pharmacist engaged in the Quality and Safety Committee.

The goal of implementing the Medication Reconciliation SOP is to ensure that patients do not experience events related to unintentional medication omissions, duplications, dosing errors, and/or known adverse interactions with prescribed new medications. These events could, and often do, result in unnecessary harm to a patient.

The purpose of event analysis may be two-fold – to analyze the process and to determine whether implementation is effective, or to analyze the events that have occurred. There are four types of events:

1. Hazard: a circumstance, agent or action with the potential to cause harm
2. Near miss/Close Call/Good Catch: an event which did not reach the patient
3. No-harm Event: an event which reached a patient but no discernable harm resulted
4. Adverse Event: an event which resulted in harm to a patient

Event analysis is a systematic process whereby the facts, contributing factors and recommendations arising, are identified and reported as a result of investigating an event or group of events. This learning is then integrated with other sources of information to inform hospital risk management and quality improvement processes.

Type of Event Analysis:

a. Comprehensive (traditional approach such as Root Cause Analysis)
b. Concise (abbreviated approach that focuses primarily on four aspects: the agreed upon facts, key contributing factors and findings, actions for improvement (if any) and evaluation)
c. Aggregate and cluster (for analysing groups of the same type of event).

WHO High5s hospitals implementing the Medication Reconciliation SOP and submitting Event Analysis reports, most often used Concise analyses as part of their evaluation activities.

11.1 Event analysis before SOP implementation

Hospital leaders may decide to implement the MR SOP as a targeted improvement strategy following the identification and analysis of a medication event(s). Sharing this baseline information will help the leaders to build the knowledge and desire for change across the organization.

11.2 Event analysis during SOP implementation

A quality improvement approach to implementing the SOP within the hospital should include a strategy for analyzing some medication event(s) related to the SOP. In particular, Event Analysis can provide important insight into events related to medication reconciliation SOP implementation. For example:

- Best Possible Medication History (BPMH) not obtained and/or reconciled within 24 hours of decision to admit
- Inaccurate or incomplete BPMH
- Inaccurate or incomplete resolution of any discrepancies
- Discrepancies not resolved within 48 hours of decision to admit

A variety of mechanisms can be used to identify patients who have experienced an adverse event or near miss as a result of medication reconciliation that is not consistent with the SOP.

1. The patient or family member, healthcare professional or any other person reports a specific concern with the medication reconciliation process or lack thereof for a specific patient
   and/or
2. During data collection for the quality measures the patient cases that are identified as not complying with the SOP
   and/or
3. A small randomized sample of patient cases regularly obtained from the targeted patient population and reviewed for the quality of medication reconciliation provided.

The event can be analysed using the organizations event analysis methodology or one of the methodologies available internationally. Engaging healthcare professionals, patients and family members in an analysis of one or more of these events will enable the identification of key contributing factors that are negatively impacting the implementation of the SOP. Targeted, evidence based strategies can then be tested to improve the Medication reconciliation SOP process and resources can be efficiently re-aligned for broader implementation. Without event analysis, anecdotal perceptions may be used to inform decisions.

11.3 Event analysis after SOP implementation

After the SOP is fully implemented, Event Analysis can be used to review events to determine if there are any key issues with maintaining SOP implementation. Mechanisms for identifying the events are the same as those used during implementation.

Refer to the WHO High5s Interim Report for a complete description of the WHO High5s Event Analysis methodology and findings.

http://www.who.int/patientsafety/implementation/solutions/high5s/en/

12. Recommendations for implementing the High 5 Medication Reconciliation SOP

The WHO High5s Medication Reconciliation SOP is not a "one-size-fits-all" solution. Some local customization of the protocol at country and hospital-level is will be necessary to secure initial buy-in and sustaining change. Some tips for successful implementation of the SOP provided by WHO High5s Project hospitals are listed in Table 3.

Table 3: Tips for implementing the WHO High5s Medication Reconciliation SOP:

General Tips:

1. After securing senior level hospital leadership support, it should be clearly articulated to the entire hospital on an ongoing basis.
2. On site champions are also critical to successful implementation. Choice of clinical champions is important - they must be interested and influential.
3. Prepare to meet resistance to change (staff, leadership), it is a major challenge to implementation.
4. Allocate sufficient resources for data collection. It is burdensome *but* essential for successful implementation. Measuring improvement helps demonstrate the need for SOP implementation, provide the implementation team with a tool for demonstrating the impact of implementation efforts, and the act of data collection and measurement feedback helps the hospital maintain attention on the patient safety area.
5. Data collection and measurement are necessary for successful implementation. They demonstrate the need for SOP implementation, provide the implementation team with a tool for demonstrating the impact of implementation efforts, and the act of data collection and measure feedback helps the hospital maintain attention on the patient safety area.
6. Use a range of measures. In addition to recommended measures, identifying the sheer number of medication discrepancies remaining unresolved at 48 hours following admission is useful for demonstrating the importance of the SOP to decision makers.
7. Resistance to change (staff, leadership) is a challenge to implementation.
8. Ongoing communication, education, and training are important to ensure and sustain compliance with the SOP.
9. Exchange of information among hospitals helps to build and maintain enthusiasm for SOP implementation.

Medication Reconciliation Lessons Learned:

1. Implementation of the SOP was most successful when a pharmacist (or pharmacy staff) was available to perform the medication reconciliation.
2. Pharmacists and pharmacy technicians tend to produce timely and accurate BPMH's.
3. Limited pharmacy resources tend to be the chief limiting factor for implementation.
4. Additional measures (or different measures) were useful. In particular, measures that identified number of medication discrepancies remaining unresolved at 48 hours following admission were used to demonstrate the importance of the SOP to decision makers.
5. Teams recognized that an accurate discharge medication reconciliation summary begins at admission, meaning that implementation needs to start at admission.
6. Tools for creating a BPMH should be developed, tested and modified as teams gain experience.

At the conclusion of the WHO High5s project, it was concluded that **it is possible to implement specific patient safety protocols with some degree of standardization across multiple hospitals and multiple countries**. Participating hospitals were able to successfully implement the key components of the Medication Reconciliation SOP. The SOP could not be implemented, however, as a "one-size-fits-all" solution. Some local customization of each protocol was necessary. This local customization (at both the country-level and hospital-level) was essential to secure initial buy-in. Customization was equally important for sustaining post-implementation changes.

Note: The following appendices provide tools, resources and references to support you in your Medication reconciliation journey. Please check the ISMP Canada website http://www.ismp-canada.org/index.htm for additional resources based upon 9 years of Canadian experience.

Top Ten Practical Tips - How to Obtain an Efficient, Comprehensive and Accurate BPMH

*Used with Permission

Best Possible Medication History Interview Guide[27]

* Used with permission from Safer Healthcare Now in Canada

Introduction

- Introduce self and profession.
- I would like to take some time to review the medications you take at home.
- I have a list of medications from your chart/file and want to make sure it is accurate and up to date.
- Would it be possible to discuss your medications with you (or a family member) at this time?
  - Is this a convenient time for you? Do you have a family member who knows your medications that you think should join us? How can we contact them?

Medication Allergies

- Are you allergic to any medications? If yes, what happens when you take (allergy medication name)?

Information Gathering

- Do you have your medication list or pill bottles (vials) with you?
- *Use show and tell technique when they have brought the medication vials with them*
  - How do you take (medication name)?
  - How often or When do you take (medication name)?
- *Collect information about dose, route and frequency for each drug. If the patient is taking a medication differently than prescribed, record what the patient is actually taking and note the discrepancy.*
- Are there any prescription medications you (or your physician) have recently stopped or changed?
- What was the reason for this change?

Community Pharmacy

- What is the name and location of the pharmacy you normally go to? *(Anticipate more than one).*
  - May we call your pharmacy to clarify your medications if needed?

Over the Counter (OTC) Medications

- Do you take any medications that you buy without a doctor's prescription? *(Give examples, i.e., Aspirin).* If yes, how do you take (OTC medication name)?

Vitamins/Minerals/Supplements

- Do you take any vitamins (e.g. multivitamin)? If yes, how do you take (vitamins name(s))?
- Do you take any minerals (e.g. calcium, iron)? If yes, how do you take (minerals name(s))?
- Do you use any supplements (e.g. glucosamine, St. John's Wort)? If yes, how do you take (supplements name(s))?

Eye/Ear/Nose Drops

- Do you use any eye drops? If yes, what are the names? How many drops do you use? How often? In which eye?
- Do you use ear drops? If yes, what are the names? How many drops do you use? How often? In which ear?
- Do you use nose drops/nose sprays? If yes, what are the names? How do you use them? How often?

Inhalers/Patches/Creams/Ointments/Injectables/Samples

- Do you use inhalers?, medicated patches?, medicated creams or ointments?, injectable medications (e.g. insulin)? For each, if yes, how do you take (medication name)? *Include name, strength, how often.*
- Did your doctor give you any medication samples to try in the last few months? If yes, what are the names?

Antibiotics

- Have you used any antibiotics in the past 3 months? If so, what are they?

Closing

This concludes our interview. Thank you for your time. Do you have any questions?

If you remember anything after our discussion please contact me to update the information.

***Note:** Medical and Social History, if not specifically described in the chart/file, may need to be clarified with patient.*

Adapted from University Health Network

Examples of Outstanding Medication Discrepancies Identified by the Independent Observer

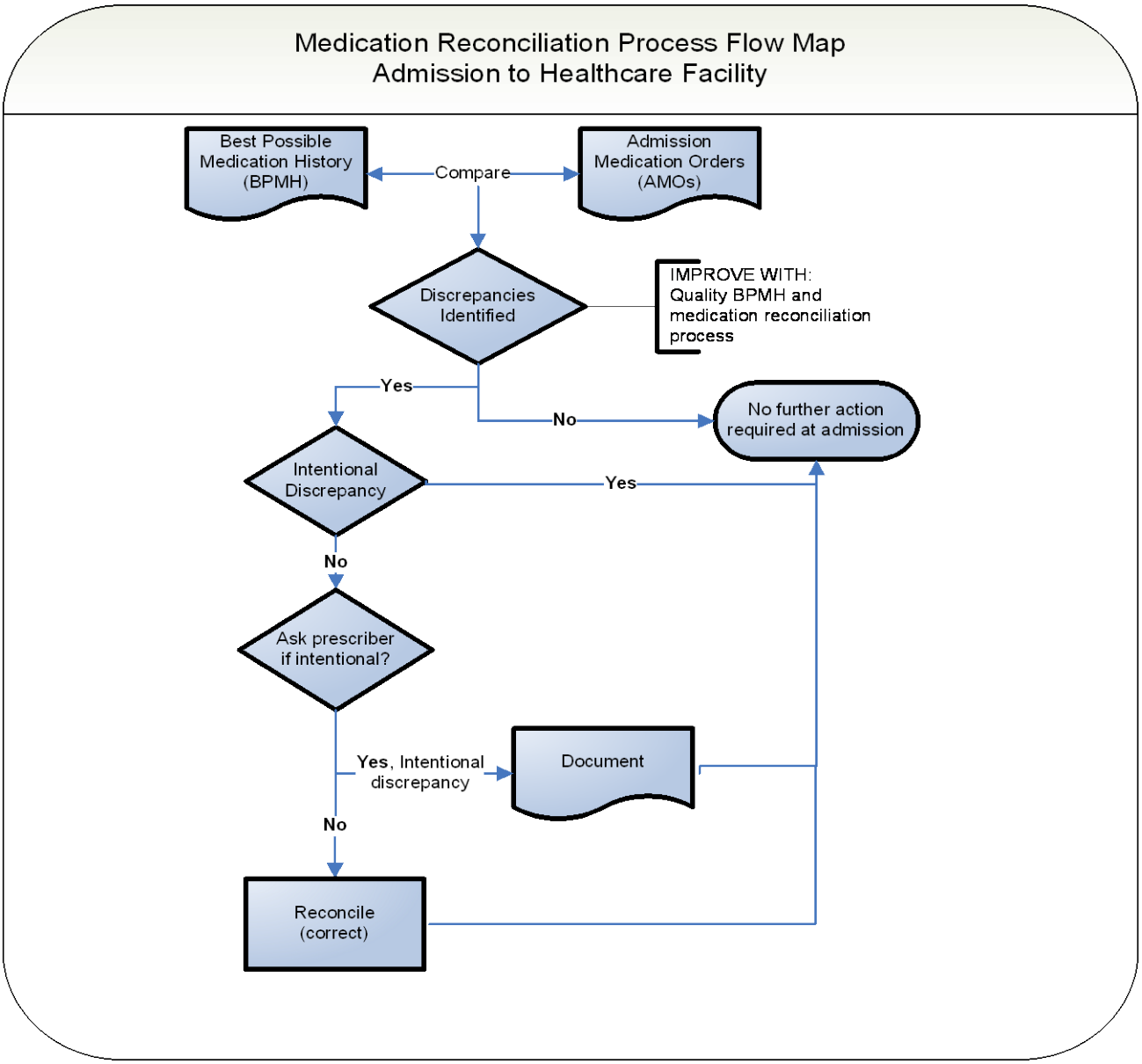
The following are examples of outstanding discrepancies measured by High5s that are found between the BPMH with other sources of information (e.g. primary histories, nursing home medication records, community pharmacy lists) AND the admission orders when the medication reconciliation documentation is reviewed by the independent observer. Discrepancies in the process of being resolved are **NOT counted** as outstanding discrepancies.

Type of Outstanding Discrepancy	Description	Examples	Follow-up with prescriber or ward pharmacist
Intentional	Discrepancies exist but are appropriate based on the patient's plan of care and <u>are clearly documented</u>. Based on the clinical judgement of the independent observer, the omission or discontinuation of: - non-prescribed medications (i.e. prescriber *did not* advise patient to take this medication), - herbals that the patient was taking regularly at home and - non-current medications taken on an 'as-needed' basis (Non-current medications: defined as medications taken by the patient greater than 3 months ago). - in the admission orders without explicit documentation are **not** reported discrepancies and will be noted as intentional discrepancies.	• New medication orders prescribed for the first time based on the patient's diagnosis or clinical status. • Antibiotics started for infection • 'as needed' medications ordered for pain/fever/vomiting etc • Pre-admission doses of patient's blood pressure medications were changed due to hypotensive episode • Warfarin and aspirin withheld for a procedure – clearly documented • Change in medication dose, frequency, route due to patient's clinical status – clearly documented • Physician's decision not to order a medication or to change the medication's dosage, route, or frequency based on the patient's clinical status at admission (e.g., antihypertensive not ordered at admission because of existing hypotension, outpatient antibiotic dosage adjusted based on renal function laboratory test values). • Similar or alternative drug is prescribed based on the hospital's formulary or patient's condition upon hospitalization. • Patient's H 2-blocker is substituted with the hospital's formulary medication; before admission • Patient is taking a combination oral analgesic and receives an order for a parenteral pain medication via a patient-controlled infusion device on admission. • Hydrocortisone cream for occasional eczema not required during hospital stay was not re-ordered. • Glucosamine for joints not required during hospital stay was omitted from the admission orders. • Sumatriptan not ordered by prescriber and not required during hospital stay as patient indicates she has not had a migraine for a long time (greater than 3 months) • Ginseng not ordered on admission by prescriber but on the BPMH.	• NO
Undocumented Intentional (failure to document)	Prescriber made an intentional choice to add, change or discontinue a medication but the choice is <u>not clearly documented.</u>	• A medication on the BPMH is not included in the admission orders. There is no documentation by the prescriber why the medication was not ordered. When the prescriber is contacted, it is determined that the omission was intentional but not documented. • Patient was on ibuprofen 200 mg po q6hprn for pain and it was not re-ordered upon admission by the prescriber. When the treating unit was consulted for clarification of this medication, it was discovered that the prescriber had verbally told the team not to restart any NSAIDS for this patient but this was not documented. Documentation is added to the chart.	YES Clarifications documented

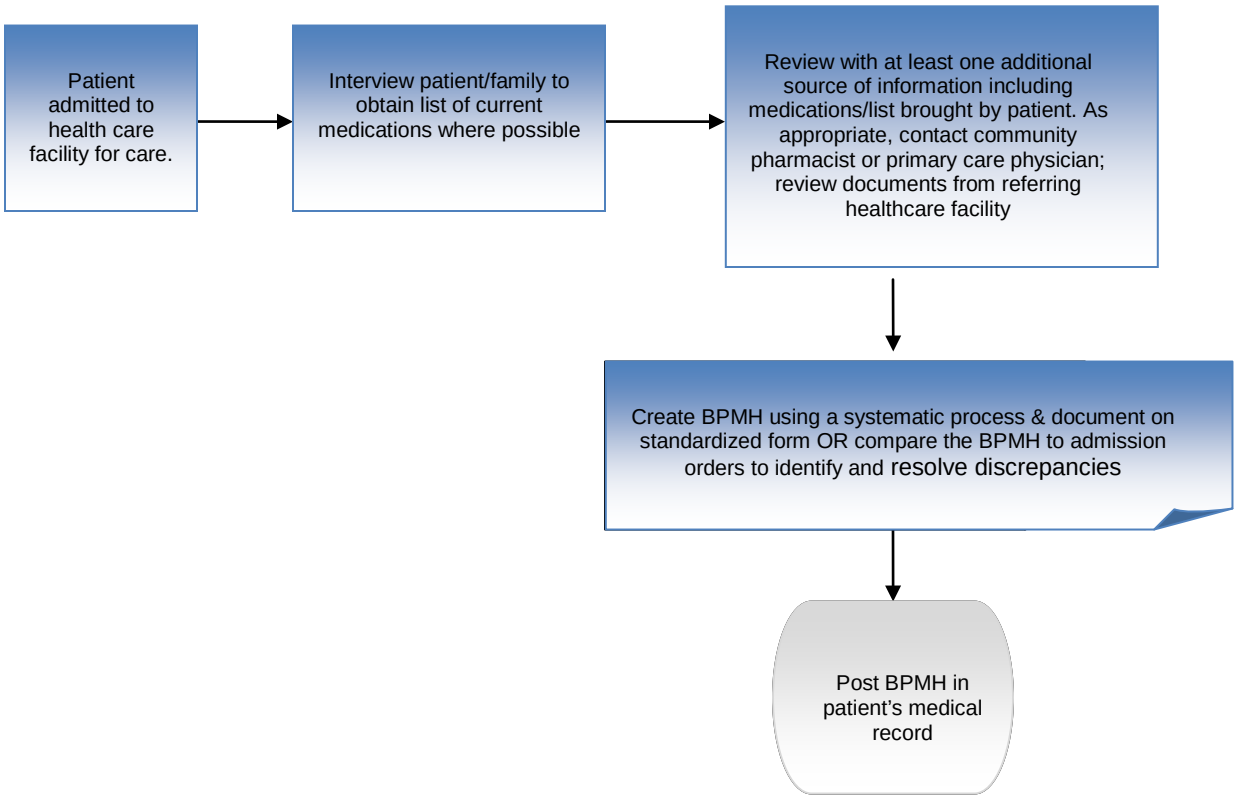
Type of Outstanding Discrepancy	Description	Examples	Follow-up with prescriber or ward pharmacist
Unintentional	Prescriber unintentionally changed, added or omitted a medication the patient was taking prior to admission and this discrepancy has the potential to become a medication error that may lead to adverse drug events or adverse patient outcome.	• Omission: Patient was not ordered a pre-admission medication. There is no clinical explanation or documentation for the omission. The omission was not identified by the team performing medication reconciliation. • E.g. BPMH and admission orders indicate patient is on hydromorphone contin 3 mg po bid. Other sources of information indicate that patient was also on hydromorphone immediate release 1 mg po q4hprn which was not ordered upon admission. No other pain medication was ordered for this patient. Upon consultation with the treating unit, it was found that the hydromorphone immediate release was unintentionally missed in the BPMH. The prescriber was notified for a new order for hydromorphone 1 mg po q4hprn. • Commission: Incorrect addition of a medication not part of the patient's pre-admission medication and there is no clinical explanation or documentation for adding the medication to the patient's therapy. The error of commission was not identified by the team performing medication reconciliation. • e.g. Patient was recently switched by her family physician from one anti-diabetic medication to another, but upon admission both anti-diabetic medications were ordered and there was no documentation or clinical indication for both. The error of commission was not identified by the team performing medication reconciliation and the team was notified to inform the prescriber to clarify which anti-diabetic medication the patient was to take in hospital • Different dosage, route or frequency of a medication than what the patient reports taking before hospitalisation is recorded on the BPMH and ordered at admission. The differences are not explained by changes in the patient's clinical status at admission such as renal or hepatic function. The error of dose, rout or frequency was not identified by the team performing medication reconciliation. • Patient (recently asked by her cardiologist) to take her blood pressure medication twice daily, but is orders in hospital indicate once daily. No indication or documentation for frequency change. This difference in dose was not identified by the team performing medication reconciliation. Clinician is asked to resolve the discrepancy with the prescriber by contacting the prescriber directly for a new order.	YES New orders written

Adapted from Gleason et al. "Reconciliation of Discrepancies in Medication Histories and Admission Orders of Newly Hospitalized Patients" Am J Health-Syst Pharm. 2004:61-1689-95.

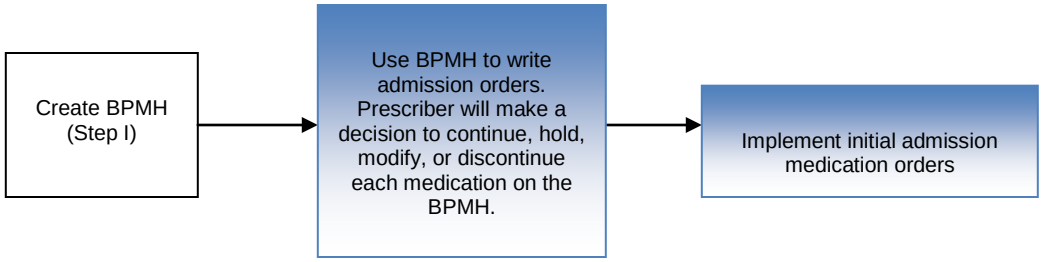
Flow Charts of the Medication Reconciliation Process



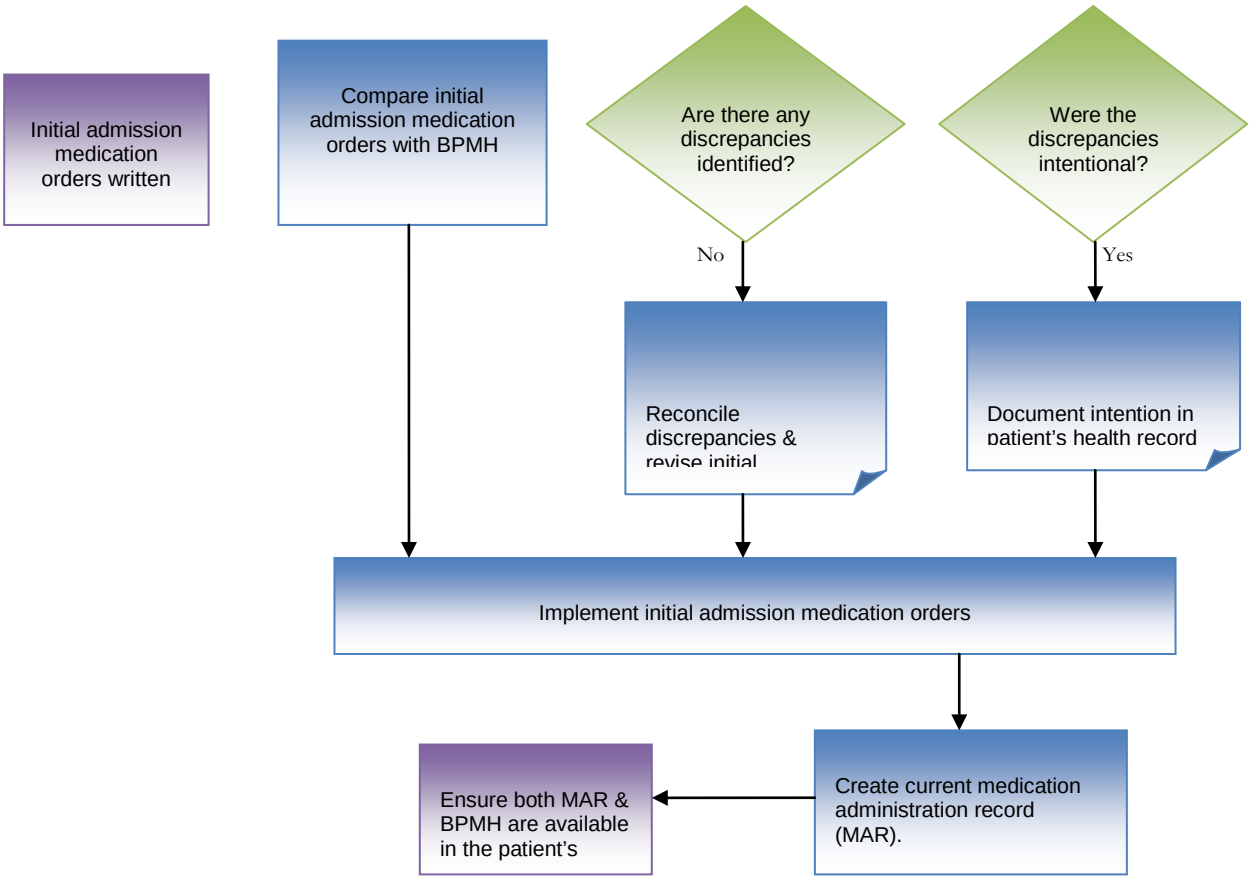
Step I. Creating a Best Possible Medication History (BPMH) on Admission[1]



Step II a. Medication Reconciliation at Admission (Proactive Model)

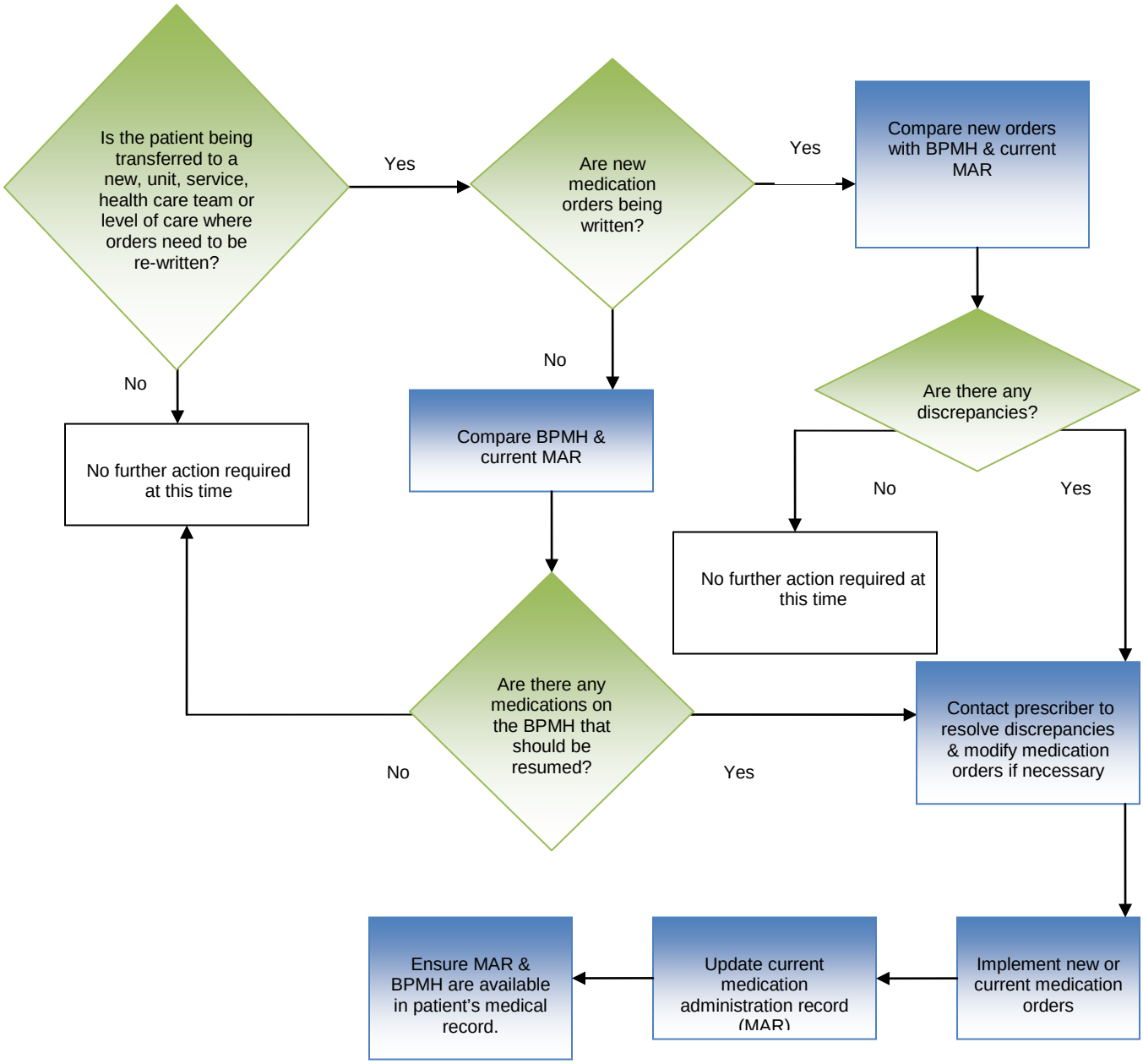


Step II b. Medication Reconciliation at Admission (Retroactive Model)



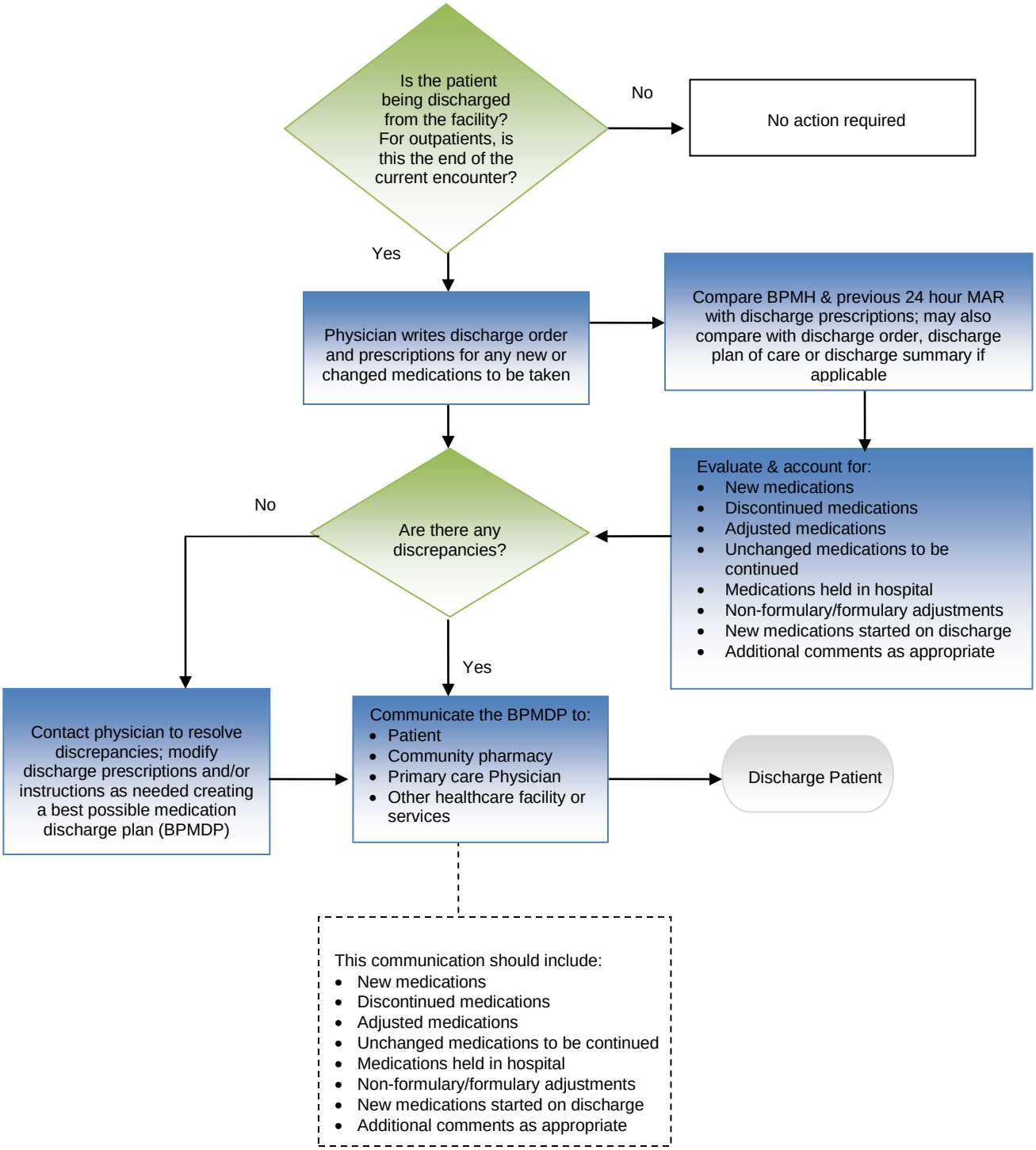
Step III. Medication Reconciliation at Internal Transfer

…To be implemented for transfers from the ED where orders need to be re-written as per hospital policy or when transferred from a different level of care e.g. intensive care unit to a general ward.

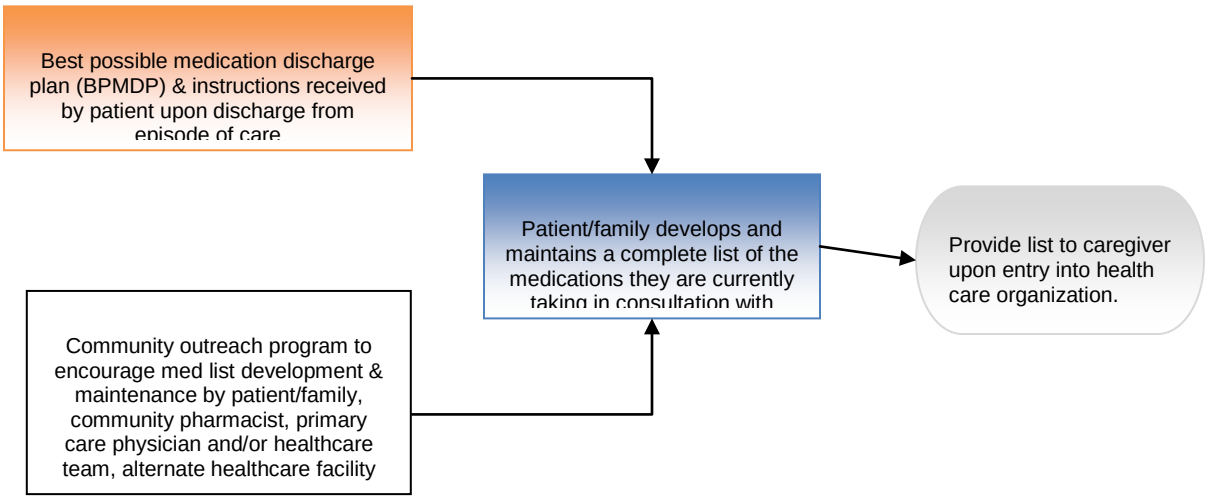


Step IV. Medication Reconciliation at Discharge

…To be addressed in later phases of implementation…



Step V. Patient Involvement Post-Discharge & Prior to Next Episode of Care



Sample Reconciliation Forms

(Notes from the *Massachusetts Reconciling Medications Collaborative)*

Sponsored by the Massachusetts Coalition for the Prevention of Medical Errors

The use of a standardized form for reconciling patients' medications lies at the heart of the ***Reconciling Medications*** safety initiative. The form serves as a vehicle for consolidating information about a patient's medications that is often dispersed throughout their medical record. Hospitals generally start by adopting the form as a place for nursing (sometimes with pharmacy assistance) to document all the medications the patient was taking prior to admission. This intake medication list is then compared against the physician's admission orders. Discrepancies are brought to the attention of the physician and, if appropriate, changes are made to the orders. Any resulting changes in orders are documented.

A second implementation step is to move clinicians to work from the home medication list on the reconciling form when they are writing their orders. This shifts the reconciling activity from one of error trapping to one of error prevention, and adds significant efficiencies to the process.

Longer-term implementation steps have included integrating the reconciling form into automated medication information systems (e.g. Meditech) and MAR entry and potentially as a building block for the implementation of a CPOE system. This automation is used to auto-generate an updated reconciling sheet that includes home medications as well as new orders for physician review at each point of patient transfer and at discharge. Some hospitals have also identified ways to turn their reconciling forms into order sheets. This requires careful planning, with the development of multiple-copy forms and also an amendment form or some other system for recording any changes in the medication list after the physician's orders have been processed.

Implementation Tip: Start testing with a copy of a reconciling form borrowed from another institution. Don't waste time in long planning meetings to settle on the best format for your organization. Instead, use small tests of both the form and the process to engage your clinicians and staff in helping develop a reconciling system that works for you.

Several examples of forms being used to reconcile medications at institutions in Massachusetts are provided below. These examples can serve as a starting point for hospitals looking to implement the reconciling safety practices.

The hospitals that provided these sample forms have told us that the ***process of developing the form*** was an important component of both educating their clinicians and nursing staff about reconciling and obtaining buy-in for the implementation effort. Therefore, they strongly suggest using these examples as a starting point, but then working within your organization to design a form that integrates into your existing processes and also matches wording, formatting and designs people are already familiar with.

UMassMemorial

PREADMISSION MEDICATION LIST VERIFICATION AND ORDER FORM
(Medication Reconciliation)

PATIENT NAME:

UNIT NUMBER:

Allergies:

LIST BELOW ALL OF THE PATIENT'S MEDICATIONS PRIOR TO ADMISSION INCLUDING OTC AND HERBAL MEDS
NEW MEDICATIONS OR MEDICATION CHANGES SHOULD BE WRITTEN ON ADMISSION ORDERS

Source of Medication list: (check all used)

- ☐ Patient medication list
- ☐ Patient/Family recall
- ☐ Pharmacy _____
- ☐ Primary care physician list / PCHIS
- ☐ Previous discharge paperwork
- ☐ Medication Administration Record from facility
- ☐ Other

☐ **CHECK HERE IF THIS IS AN ADDENDUM TO OR REVISION OF PREVIOUSLY COMPLETED MEDICATION LIST**

MEDICATION HISTORY RECORDED/VERIFIED BY: _____
DATE RECORDED: _____

CIRCLE C to continue OR DC to discontinue

MEDICATION NAME (WRITE LEGIBLY)	DOSE (mg, mcg,)	ROUTE (PO, OT, SC, IV)	FREQUENCY	LAST DOSE DATE/TIME	PHYSICIAN ORDER Continue on Admission	PHYSICIAN ORDER Continue on Transfer	COMPLETE On Discharge
1.					C DC		C DC
2.					C DC		C DC
3.					C DC		C DC
4.					C DC		C DC
5.					C DC		C DC
6.					C DC		C DC
7.					C DC		C DC
8.					C DC		C DC
9.					C DC		C DC
10.					C DC		C DC
11.					C DC		C DC
12.					C DC		C DC
13.					C DC		C DC
14.					C DC		C DC
15.					C DC		C DC

Do not scan or take off orders without MD/NP/PA signature

M.D. Signature: _____ *Print Name:* _____

Pager: *Date/Time:*

Reviewed and Transcribed

Nurse Signature: _____ *Date/Time:* _____

Scan to Pharmacy. File under Orders with the History and Physical.

*Reference: Accessed August 27, 2010 www.macoalition.org/Initiatives/RecMeds/**UMass**Reconcil**Form**.doc*

Sunnybrook
HEALTH SCIENCES CENTRE

PRE-ADMISSION MEDICATION LIST

PATIENT IDENTIFICATION

Date YY/MM/DD	☐ No Known Allergies	Medication Allergies/Intolerances (specify):

PRESCRIPTION MEDICATIONS				* Physician's Plan On Admission		
Medication Name	Dose	Route	Frequency	Continue	Change	Discontinue
NON-PRESCRIPTION MEDICATIONS (e.g., Over-the-counter products, herbals, others)						

Source of Medication List (check all used):	List Recorded by:			
☐ Review of medication vials or patient medication list	Print Name	Signature	Pager	Date:
☐ Patient/family recall				YY/MM/DD
☐ Pharmacy Name: _____	List Updated by:			
Tel: _____				YY/MM/DD
☐ Medication Administration Record from another facility				YY/MM/DD
☐ Other (specify): _____				YY/MM/DD

Pharmacist's Clarification of Pre-Admission Medications Required: ☐ Yes ☐ No
(If Yes, please indicate on admission orders)

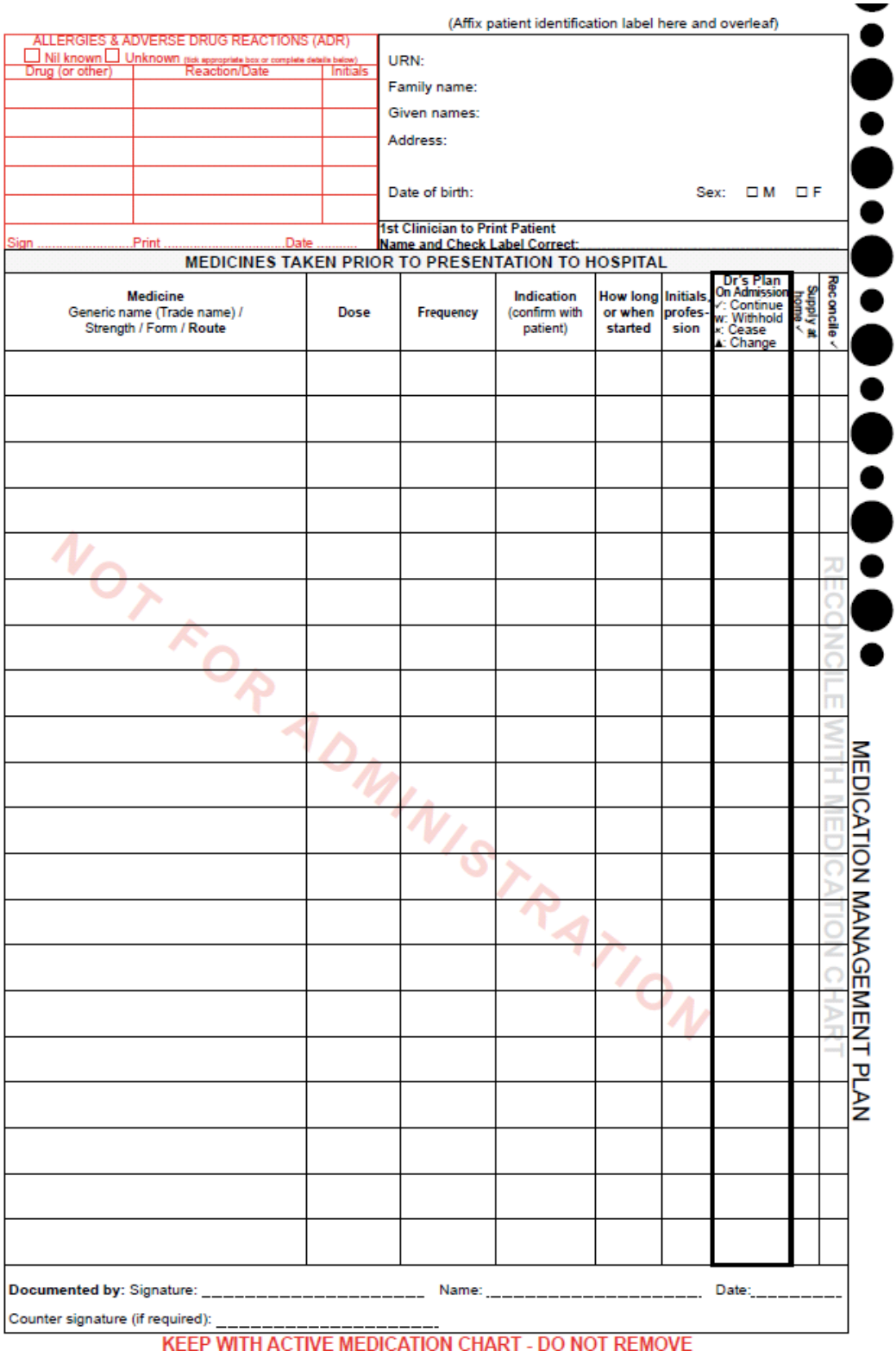
* Please note for elective surgical patients, the patient's pre-admission medication list may have changed from the time that this list was generated in the Pre-Assessment Centre

PR 99630 (07-2006) **DISTRIBUTION** **White - Original - Chart** **Yellow - Copy**

**** Used with Permission***

Example of a paper-based form for recording the BPMH

Source: Australian Commission on Safety and Quality in Health Care.



(Affix patient identification label here and overleaf)

ALLERGIES & ADVERSE DRUG REACTIONS (ADR)
☐ Nil known ☐ Unknown (tick appropriate box or complete details below)

Drug (or other)	Reaction/Date	Initials

Sign ..... Print ..... Date .....

URN:
Family name:
Given names:
Address:

Date of birth: Sex: ☐ M ☐ F

1st Clinician to Print Patient Name and Check Label Correct: .....

MEDICINES TAKEN PRIOR TO PRESENTATION TO HOSPITAL

Medicine Generic name (Trade name) / Strength / Form / Route	Dose	Frequency	Indication (confirm with patient)	How long or when started	Initials, profes-sion	Dr's Plan On Admission ✓: Continue w: Withhold ×: Cease ▲: Change	Supply at Home ✓	Reconcile ✓

Documented by: Signature: _____ Name: _____ Date: _____

Counter signature (if required): _____

KEEP WITH ACTIVE MEDICATION CHART - DO NOT REMOVE

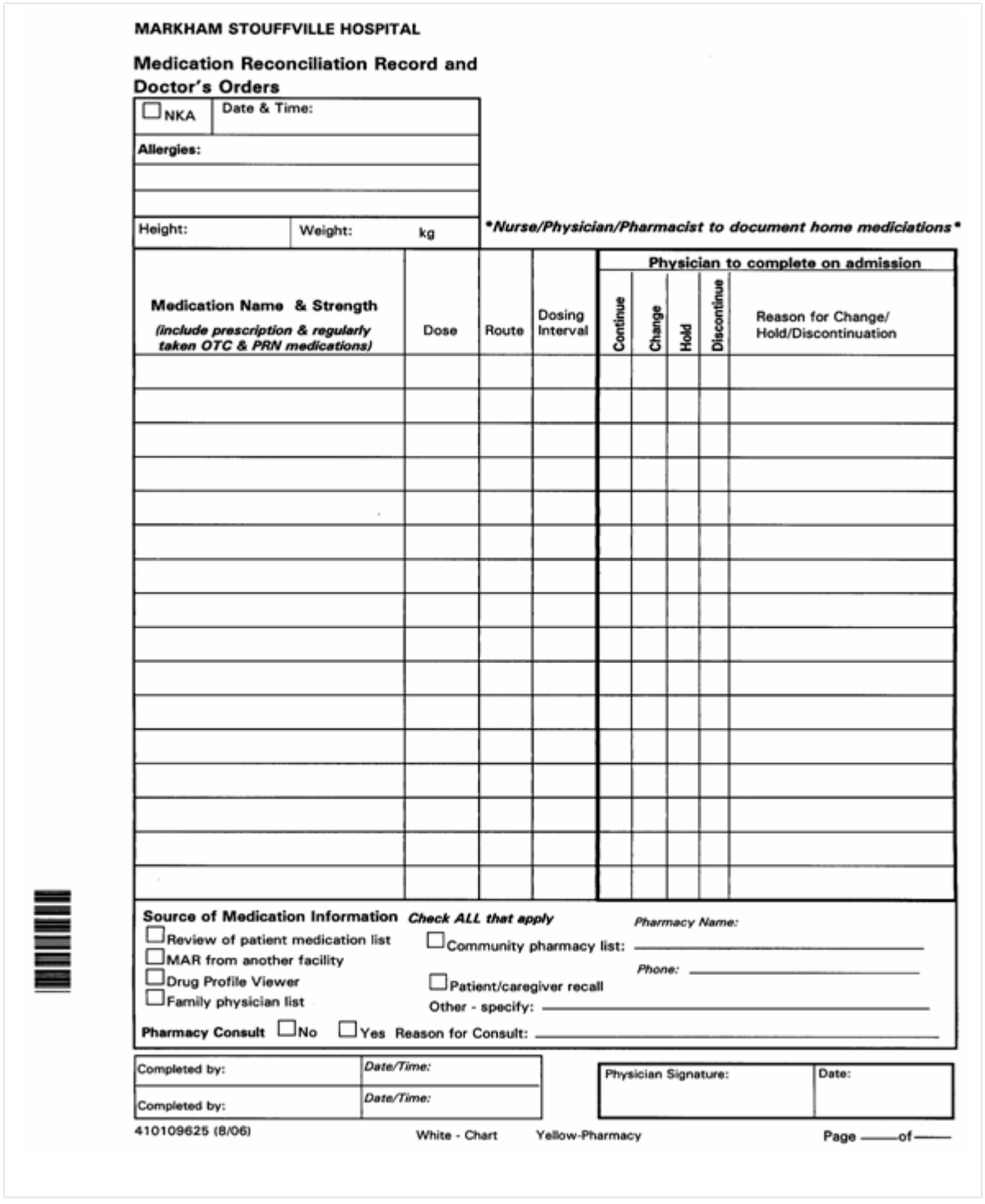
NOT FOR ADMINISTRATION

RECONCILE WITH MEDICATION CHART

MEDICATION MANAGEMENT PLAN

Sample Admission Medication Order Form (BPMH Leading to Orders)

** Used with Permission from Markham Stouffville Hospital, Markham Ontario – Medication Reconciliation Record and Doctor's orders*



MARKHAM STOUFFVILLE HOSPITAL

Medication Reconciliation Record and Doctor's Orders

☐ NKA | Date & Time:

Allergies:

Height: | Weight: kg

Nurse/Physician/Pharmacist to document home medications

Medication Name & Strength *(include prescription & regularly taken OTC & PRN medications)*	Dose	Route	Dosing Interval	Physician to complete on admission: Continue	Change	Hold	Discontinue	Reason for Change/ Hold/Discontinuation

Source of Medication Information *Check ALL that apply*

☐ Review of patient medication list
☐ MAR from another facility
☐ Drug Profile Viewer
☐ Family physician list
☐ Community pharmacy list: *Pharmacy Name:* _____ *Phone:* _____
☐ Patient/caregiver recall
Other - specify: _____

Pharmacy Consult ☐ No ☐ Yes Reason for Consult: _____

Completed by:	*Date/Time:*
Completed by:	*Date/Time:*

Physician Signature:	Date:

410109625 (8/06) White - Chart Yellow-Pharmacy Page ____ of ____

German example of BPMH form with recommendations for the admission order (Example of the patient medication order form used with kind per-smission of Bad Berka Central Hospital, Germany)

Aufnahmemedikation

Name: **geb.:**	**wohnhaft:**	**Grund der stationären Aufnahme:** Normal	**Station:** **FA:**	**Aufn.-Datum:** 25.08.2014 **Aufn.-Nr:**
Begleiterkrankungen: Hypertonie Unverträglichkeit Kontrastmittel Herzkatheter (Erbrechen) Chron. Niereninsuffizienz (lt. Brief)			**Größe:** 162 cm	**Gewicht:** 79.5 kg **Blutdruck:**

Ärztl. Med.	Selbstmed.	Aktuelle häusliche Medikation des Patienten			Empfehlung Bemerkung	Aktuelle stationäre Medikation des Patienten Austauschpräparate, gelistete Medikamente		
		Medikament	Inhaltsstoff	Dosierung		Medikament	Inhaltsstoff	Dosierung
X		ASS 100 TAB, SW	Acetylsalicylsäure	1 - 0 - 0 - 0		ASS 100 TAB, SW	Acetylsalicylsäure	1 - 0 - 0 - 0
X		BISOBETA 10 Filmtabletten	- Bisoprolol hemifumarat 10 mg	1 - 0 - 0 - 0		Bisoprolol 5 FTAB	Bisoprolol hemifumarat	2 - 0 - 0 - 0
X		HCT-CT 25 mg Tabletten	- Hydrochlorothiazid 25 mg	1/2 - 0 - 0 - 0		HCT 12,5 TAB	Hydrochlorothiazid	2 - 0 - 0 - 0
X		Pantoprazol 20 FTAB, SW	Pantoprazol natrium-1,5-Wasser	1 - 0 - 0 - 0	0,5 h vor dem Frühstück	Pantoprazol 20 FTAB, SW	Pantoprazol natrium-1,5-Wasser	1 - 0 - 0 - 0
X		SIMVASTATIN STADA 40 mg Filmtabletten	- Simvastatin 40 mg	0 - 0 - 1 - 0	nicht mit Grapefruitsaft o.ä.!	Simvastatin 20 FTAB	Simvastatin	0 - 0 - 2 - 0
X		FORAIR 12 µg 100 Hub Dosieraerosol	- Formoterol hemifumarat-1-Wasser 12 µg	1 - 0 - 1 - 0	Medikation ausgehändigt	Formoterol 12µg DA	- Formoterol hemifumarat-1-Wasser 12 µg	1 - 0 - 1 - 0
X		IBUFLAM 400 mg Lichtenstein Filmtabletten	- Ibuprofen 400 mg		bei Bedarf Tageshöchstdosis: 2400 mg!	Ibuprofen 400 FTAB	Ibuprofen	
X		SALBUHEXAL N Dosieraerosol 200 Hub	- Salbutamol hemisulfat 0.12 mg		bei Bedarf Medikation ausgehändigt	Salbutamol 100µg DA	Salbutamol hemisulfat	
X		Kytta Sedativum DRA	Baldrianwurzel-Trockenextrakt, Hopfenzapfen-Trockenextrakt, Passionsblumen-Trockenextrakt		bei Bedarf	Kytta Sedativum DRA	Baldrianwurzel-Trockenextrakt, Hopfenzapfen-Trockenextrakt, Passionsblumen-Trockenextrakt	

Interaktionsprüfung durchgeführt: Ja	**Datum + Unterschrift Apotheker** 25.08.14	**Datum + Unterschrift behandelnder Arzt** 25.08.14

Fiche de conciliation des traitements médicamenteux

uméro de compteur

Identifiant patient :

faut majeur d'observance identifié

BILAN MEDICAMENTEUX OPTIMISE "BMO"			ORDONNANCE MEDICAMENTEUSE A L'ADMISSION			CONCILIATION DES
Date de réalisation (jj/mm/aaaa)			*Date de réalisation (jj/mm/aaaa)*			*Date de réalisation (jj/mm/aaaa)*
O réalisé dans les 24 h (oui=1/non=0)						*CTM réalisée dans les 24 h (oui=1/non=0)*
édicaments prescrits en routine	**Dosage / voie**	**Posologie**	**Médicaments prescrits à l'admission**	**Dosage / voie**	**Posologie**	**Statut des médicaments**
dicaments identifiés bservateur endant						

Temps de réalisation BMO (mn)						

Fait par :

Fait par :

Fait par :

Type de modifications apportées suite aux divergences initiales détectées

Nombre de documentation		0
Nombre de correction	0	
Nombre de "pas de modification"		0

Sources d'informations pour la réalisation du BMO

		NOM - Coordonnée
Patient		
Famille		
Ordonnance		
Pharmacien		
Médecin		
Autre		

Source: a BPMH format from Haga hospital, the Hague, Netherlands

MEDICATIEOVERZICHT en MEDICATIE ADVIES rondom operatie, opgesteld op 6 oktober 2014 **Naam** **(V, HAGA PID)** HagaZiekenhuis

BSN nummer:
Geb. Datum:

Broninformatie : ☐ Geverifieerd met de patiënt/vertegenw. ☐ AMO openbare apotheek

☐ Patiënt heeft innameschema/medicijnlijst andere inst.
☐ Patiënt heeft Baxter-rol
☐ Meegebrachte medicatie

Intoleranties, Contra indicaties, Allergieën (ICA)

Soort	Omschrijving	Toelichting
Ongewenste groep		
Ongewenst middel	TELMISARTAN	
Contra-indicatie		
Opmerkingen		

Ruimte voor patiëntenetiket

Medicatie

Geneesmiddel	Dosering	Toelichting	TW	Voor operatie	Na operatie	Toelichting
ESOMEPRAZOL 40MG CAPSULE	1 x daags 1 capsule msr, Dagelijks	th	oraal	☐ Continueren ☐ Stop ... dagen voor operatie	☐ Continueren ☐ Stoppen ☐ Herstart ... dagen na operatie	
PERINDOPRIL TERT-BUTYL/INDAPAMIDE TABLET 4/1,25MG PERINDOPRIL INDAPAMIDE TABLET 4/1,25MG	1 x daags 2 tabletten, Dagelijks	th	oraal	☐ Continueren ☐ Stop ... dagen voor operatie	☐ Continueren ☐ Stoppen ☐ Herstart ... dagen na operatie	
BUSPIRON HCL 10MG	3 x daags 1 tablet, Dagelijks	th	oraal	☐ Continueren ☐ Stop ... dagen voor operatie	☐ Continueren ☐ Stoppen ☐ Herstart ... dagen na operatie	
METFORMINE HCL 500MG TABLET	1 x daags 1 stuk, Dagelijks	th	oraal	☐ Continueren ☐ Stop ... dagen voor operatie	☐ Continueren ☐ Stoppen ☐ Herstart ... dagen na operatie	
THIAMINE HCL 100MG TABLET THIAMINE HCL	1 x daags 1 tablet, Dagelijks	th	oraal	☐ Continueren ☐ Stop ... dagen voor operatie	☐ Continueren ☐ Stoppen ☐ Herstart ... dagen na operatie	
KALCIPOS-D KAUWTABLET 500MG/800IE	1 x daags 1 kauwtablet, Dagelijks	th	oraal	☐ Continueren ☐ Stop ... dagen voor operatie	☐ Continueren ☐ Stoppen ☐ Herstart ... dagen na operatie	
HYDROXOCOBALAMINE HCL 2ML=1000MICROGRAM HYDROCOBALAMINE INJVLST	VT 1 ampul, EEN MAAL PER 8 WEKEN	th EEN MAAL PER 8 WEKEN>volgens schema	subcutaan	☐ Continueren ☐ Stop ... dagen voor operatie	☐ Continueren ☐ Stoppen ☐ Herstart ... dagen na operatie	

afdrukdatum: 06-10-2014 / 11:34

THUISMEDICATIEOVERZICHT (TMO) van 6 oktober 2014 11:33 **Naam** **(V, HAGA PID)**

HagaZiekenhuis

BSN nummer:
Geb. Datum:

Broninformatie : ☐ Geverifieerd met de patiënt/vertegenw. ☐ AMO openbare apotheek

☐ Patiënt heeft innameschema/medicijnlijst andere inst.
☐ Patiënt heeft Baxter-rol
☐ Meegebrachte medicatie

Intoleranties, Contra indicaties, Allergieën (ICA)

Soort	Omschrijving	Toelichting
Ongewenste groep		
Ongewenst middel	TELMISARTAN	
Contra-indicatie		
Opmerkingen		

Ruimte voor patiëntenetiket

Medicatie

Geneesmiddel	Datum	Einddatum	Dosering	Toelichting	TW	Discrepantie analyse
ESOMEPRAZOL 40MG CAPSULE	03-10-2014		1 x daags 1 capsule msr, Dagelijks	th	oraal	
PERINDOPRIL TERT-BUTYL/INDAPAMIDE TABLET 4/1,25MG PERINDOPRIL INDAPAMIDE TABLET 4/1,25MG	03-10-2014		1 x daags 2 tabletten, Dagelijks	th	oraal	
BUSPIRON HCL 10MG	03-10-2014		3 x daags 1 tablet, Dagelijks	th	oraal	
METFORMINE HCL 500MG TABLET	03-10-2014		1 x daags 1 stuk, Dagelijks	th	oraal	
THIAMINE HCL 100MG TABLET THIAMINE HCL	03-10-2014		1 x daags 1 tablet, Dagelijks	th	oraal	
KALCIPOS-D KAUWTABLET 500MG/800IE	03-10-2014		1 x daags 1 kauwtablet, Dagelijks	th	oraal	

afdrukdatum: 06-10-2014 / 11:33

Discharge Tools

Example of Letter to Community Pharmacist showing BPMDP[15] **Used with Permission*

Date:
Patient Name:
Hospital:
Nursing Unit:
NU Phone:

University Health Network

Toronto General Hospital Toronto Western Hospital Princess Margaret Hospital

Dear Pharmacist,
Your patient was admitted on and discharged on

Documented Allergies:

Allergy	Reaction
Penicillin	Hives 10 years ago; tolerates cefazolin

The following are medication changes that have occured:

New Medications	Rationale
Ferrous Gluconate 300mg TID	Patient found to be anemic in hospital. Values as of Nov 2/05 Ferritin = 10ug/L; TSAT = 0.15
Omeprazole 40mg daily	Patient experienced non H.Pylori upper GI bleed in hospital. Duration of therapy will be reassessed by GI physician in 8 weeks.
Ciprofloxacin 500mg BID	Urinary tract infection. E. Coli in urine sensitive to Ciprofloxacin; plan to treat for total of 7 days. Started Nov 13/05.

Stopped Medications	Rationale
Aspirin 81mg daily	Patient experienced an upper GI bleed
Meloxicam 7.5mg daily	Patient was taking 2-3 times a day. May have contributed to bleed and not to be restarted

Dose Changes	Rationale
Atorvastatin increased to 40mg HS	Lipid values measured on Nov 2/05 found to be elevated. LDL = 4.1 mmol/L; HDL = 0.98 mmol/L; Total Chol/HDL = 5.3 mmol/L; TG = 1.12 mmol/L
Calcium carbonate increased to 1000mg elemental calcium TID with meals	Phosphate value found to be high @ 2.1 mmol/L on Nov 2/05. See below
Metoprolol increased to 50mg BID	Blood pressure was elevated in hospital (163/90 mmHg at highest). Target blood pressure is 130/80 mmHg.

Example of Letter to Community Pharmacist showing BPMDP[15] **Used with Permission*

Please find a current list of medications attached.

The following are unresolved/ongoing medication related issues

- High lipid values
  - Please re-check lipids in 3 months and suggest adjustment of atorvastatin dose accordingly
- Patient was taking Aspirin 81mg EC tablet daily for caridac protection. It was stopped due to GI bleed. to reassess restarting ASA at next appointment
  - Please follow-up with re-initiation of ASA

Other issues include:

- **Education/Counseling**
  Patient may benefit from additional discussion on use of NSAIDs for pain. Meloxicam was being taken at higher doses then prescribed. Patient was educated on adverse effects of NSAIDs and instructed to use acetaminophen for pain in the future.

- **Monitoring needed**
  Continue to monitor blood pressure and suggest titration of medications accordingly. Monitor phosphate levels and suggest adjustment of phosphate binder accordingly. Re-check iron profile in 3 months.

Please attach this document with the patient's prescriptions if possible
Feel free to contact me if you have any questions or concerns.

Thank you,

Phone:
Pager:

Verbal consent was obtained from the patient to release the above information on

Current medication list for **Sander, Dale** as of **February 02, 2006**

Drug and dose	Directions
Atorvastatin 40 MG tablet	Take 1 tablet at bedtime
Calcitriol 0.25 MCG capsule	Take 1 capsule once daily
Calcium carbonate 1250 MG tablet (500 MG elemental Ca++)	Take 2 tablets three times a day with meals
Ciprofloxacin 500 MG tablet	Take 1 tablet two times a day for 4 more days. Separate from calcium by at least 2 hours.
Darbepoetin Inj 60MCG/0.3ML syringe	Inject 60 MCG subcutaneously every Friday
Docusate sodium 100 MG capsule	Take 1 capsule two times a day
Ferrous fumarate 300 MG tablet	Take 1 tablet at bedtime
Metoprolol 25 MG tablet	Take 2 tablets (50 MG) two times a day
Omeprazole 20 MG tablet	Take 2 tablets (40 MG) once daily
Ramipril 5 MG capsule	Take 1 capsule once daily
Acetaminophen 325 MG tablet	Take 1-2 tablets every 4 hours as needed for pain

Example of a Medication chart for the patient showing the Best possible Discharge Plan[15]

**Used with Permission*

Medication chart for as of

Documented Allergies:
- Penicillin

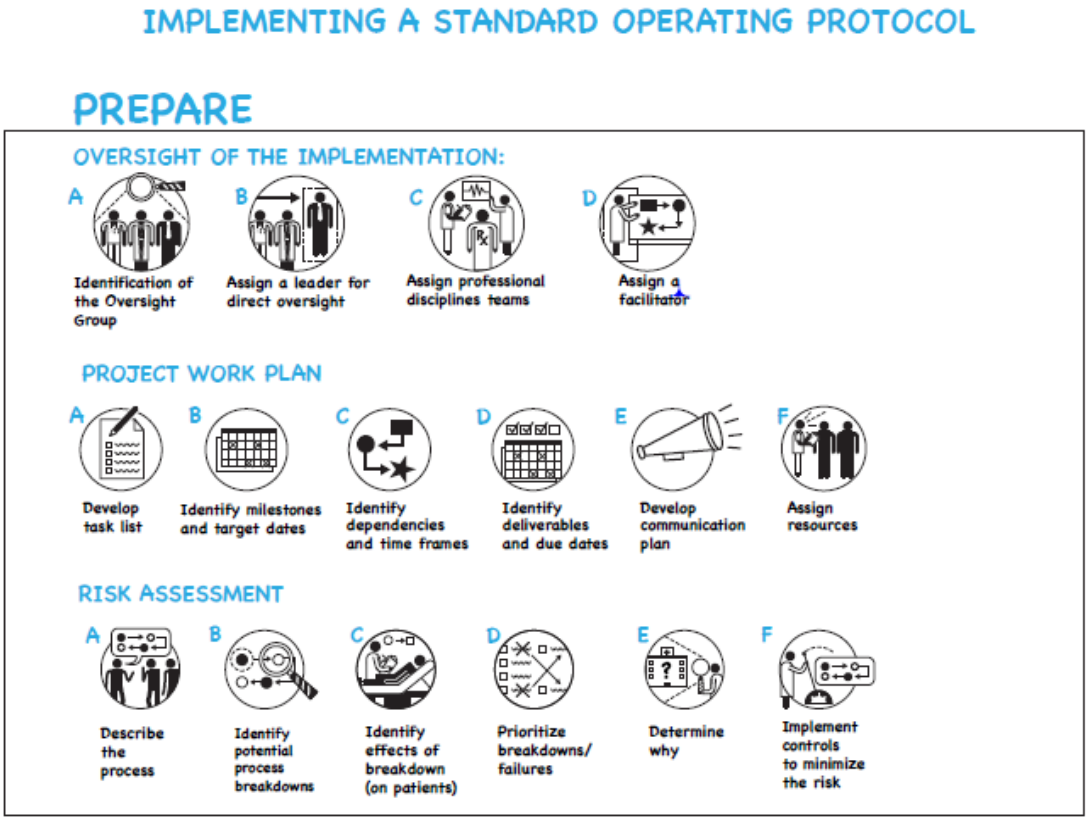
My family physician is _____ Phone # _____

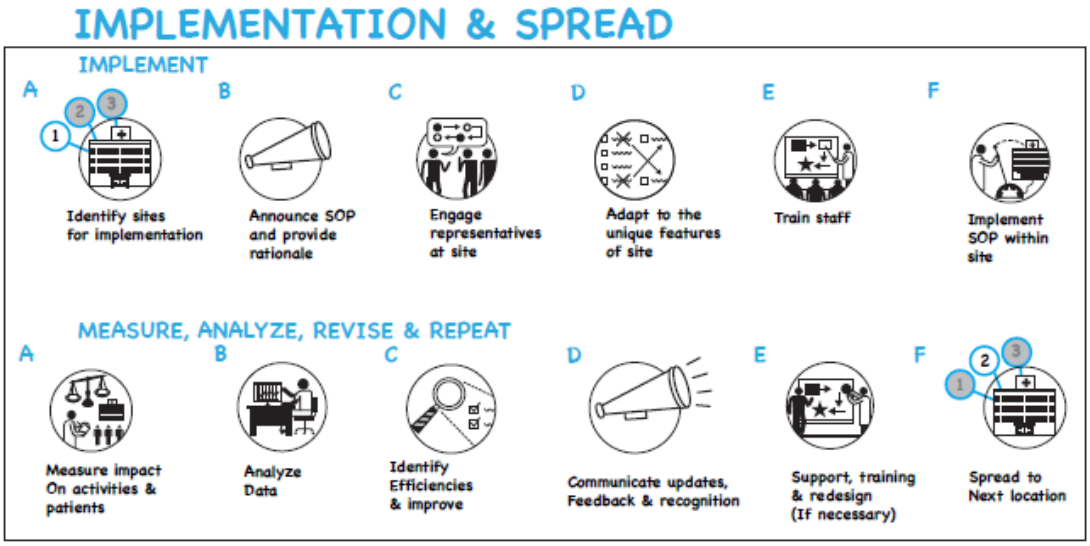
Medication	Directions	Comments	Morning	Noon	Supper	Bedtime
Atorvastatin 40 MG tablet	Take 1 tablet at bedtime	Lowers cholesterol				✓
Calcitriol 0.25 MCG capsule	Take 1 capsule once daily	Vitamin D supplement	✓			
Calcium carbonate 1250 MG tablet (500 MG elemental Ca++)	Take 2 tablets three times a day with meals	Lowers phosphate levels	✓	✓	✓	
Ciprofloxacin 500 MG tablet	Take 1 tablet two times a day for 4 more days. Separate from calcium by at least 2 hours.	Treats urinary tract infections		✓		✓
Darbepoetin Inj 60MCG/0.3ML syringe	Inject 60 MCG subcutaneously every Friday	Stimulates production of red blood cells				
Docusate sodium 100 MG capsule	Take 1 capsule two times a day	Softens stool	✓		✓	
Ferrous fumarate 300 MG tablet	Take 1 tablet at bedtime	Replaces iron				✓
Metoprolol 25 MG tablet	Take 2 tablets (50 MG) two times a day	Lowers blood pressure	✓		✓	
Omeprazole 20 MG tablet	Take 2 tablets (40 MG) once daily	Lowers stomach acid	✓			
Ramipril 5 MG capsule	Take 1 capsule once daily	Lowers blood pressure	✓			
Acetaminophen 325 MG tablet	Take 1-2 tablets every 4 hours as needed for pain	Decreases pain associated with osteoarthritis. Use as needed.				

*** If discrepancies occur between the following list and your prescription, please follow the instructions on your medication vials unless your physician has indicated otherwise ***

Prepared by Phone:
Pager:

Implementing SOP for Medication Reconciliation





MEDICATION RECONCILIATION SAMPLE WORK PLAN AND TASK LIST

Key Milestone	Task name	Duration	Start Date	Finish Date	Dependencies	Responsibility
1. Define and assign governance responsibilities	Identify governance group					
	Identify senior admin "contact" for resource decisions					
	Assign representatives from each professional discipline					
	Assign facilitator					
2. Plan the practice change	Draft of current medication use process flow					
	Identify and prioritise activities					
	Draft of medication use process with integrated medication reconciliation steps					
	Assign responsibilities for new or revised steps					
	Identify milestones for pilot test and subsequent implementation					
3. Risk assessment of the process to be implemented	Identification & prioritization of failure modes					
	Proposal for adaptation or redesign of the process					
	Approval of adaptation/ redesign					
4. Pilot test of the process	Identify test site(s)/unit(s)					
	Collect baseline data					
	Train staff					
	Implement new process					
5. Evaluation	Develop evaluation plan					
	Implement evaluation strategy					
6. Spread Plan	Determine sequence, timing & resources					
	Develop draft plan					
	Implement plan					

Key Milestone	Task name	Duration	Start Date	Finish Date	Dependencies	Responsibility
7.Communication plan (include within work plan)	Develop draft plan					
	Develop communication tools					
	Implement communication plan					
8. Reporting and sign off	Set dates for periodic reporting to governance group					
	Review and revision of draft work plan					
	Sign off on work plan by governance group					

Appendix I

Sample Risk Assessment of the Proposed Medication Reconciliation Process

Step of process (from Flow Chart)	Potential Failure Mode	Possible Causes	Probable Effect	Frequency of Failure*	Discover-ability	Severity of Effects*	RPN**	Controls/Protections
Receive current medicines list from patient	Patient does not have a list	Unaware of need; no program in place	Delay in treatment	3	1	2	6	Community outreach program available
	List is incomplete or inaccurate	Unaware of meds; list not updated	Delay in treatment Medication error	3	3	3	27	None
Interview patient/family to obtain list	Unable to provide accurate list	Language barrier; pt unconscious; family not present	Delay in treatment Medication error	2	1	3	6	Interpreter service available
Verify list with patient/family & update as necessary								
Review medicines brought by patient; contact community pharmacist or primary care physician; review documents from referring health care facility								
Create BPMH & document on standardized form								
Post BPMH inpatient medical record								

* Recommend simple 3-point (high, medium, low) or 5-point scale

** Risk Priority number = Frequency x Discoverability x Severity

Sample Measurement Logs and Worksheets

Medication Reconciliation Monthly Log

Number of Eligible Patients	Patient ID	Date/Time Decision to Admit	Date/Time Medication Reconciliation is Completed	Check if MedRec Within 24 hours (Eligible for MR 2, MR3 and MR4)
				Total: Page ____/____

Patient Level: Independent Observer Worksheet to Identify Medication Discrepancies

The independent observer will compare the existing BPMH and any readily available sources of medication information (e.g. primary histories, nursing home medication records, community pharmacy lists) to existing admission orders for eligible patients and ensure all discrepancies have been identified by the team. This will be done for the sample of at least 30 randomly selected patients who are 65 years or older and who have been admitted to a medical unit through the emergency department who have had medication reconciliation. Outstanding discrepancies* are to be identified after the usual process of medication reconciliation has occurred, documented on this form and categorized as either

	Date & Time:	Hours between Admission and medication reconciliation:	Age equal or greater than 65 years of age? ☐ Yes ☐ No Patient admitted through the Emergency Department? ☐ Yes ☐ No
			Eligible case for reporting (yes to both answers above)? ☐ Yes ☐ No **(Area A)**
			Was medication reconciliation completed for this patient during hospital stay? ☐ Yes ☐ No **(Area B)**
			Was this patient reconciled within 24 hrs? ☐ Yes ☐ No **(Area C)**
Outstanding Medication Discrepancies between BPMH+Other Sources of Information to Admission Orders			Did this patient have at least 1 unintentional discrepancy? ☐ Yes ☐ No **(Area D)**

BPMH + Other Sources of Information				Admission Orders				Medication Reconciliation Status		
Medication Name and Strength (include prescription & regularly taken non-prescription and medications taken 'as needed')	**Dose**	**Route**	**Dosing Interval**	**Medication Name and Strength (include prescription & regularly taken non-prescription and medications taken 'as needed')**	**Dose**	**Route**	**Dosing Interval**	**Undocumented Intentional Discrepancies**	**Unintentional Discrepancies**	**Comments/Notes**
								Discrepancy Volume		
								Total MR2 **(Area E)**:	Total MR3 **(Area F)**:	

Completed by: _____ Date/Time: _____ Page _____ of _____

Independent Observer Instructions.

1. Compare the BPMH + other sources of medication information for eligible patients (e.g. primary histories, nursing home medication records, community pharmacy lists) to the admission orders.
2. Any outstanding discrepancies not found by the team will be documented on this form.
3. The total number of undocumented intentional discrepancies and the total number of unintentional discrepancies will be calculated and entered into box E and F.

***Note: Outstanding Discrepancies are medication discrepancies found during the independent observer process and does not include medication discrepancies identified by the team or medication discrepancies that are in the process of being resolved.**

Canadian Quality Audit Tool

Contact Name and Phone Number (include area code):

FAX Form in FINE Resolution NO COVER PAGE to 1-877-846-5153
For information: 416-946-3103 or metrics@saferhealthcarenow.ca
Access your data at https://shn.med.utoronto.ca/metrics

Intervention: MedRec-Acute - Medication Reconciliation in Acute Care
Organization: 100 ABC Hospital
In/Out: In Patient
Adult/Paeds: Adult Age Group:
Program: Medicine
Service: General Medicine
Unit/Site: Intensive Care Unit (ICU)
Procedure/Diagnostic Group:
Patient Sample: Demo 1
Point Of Transfer: Admission

Printed On: 2013-11-29

safer healthcare now!

YEAR 201 3 4 5
MONTH JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
DAY 0 1 2 3 0 1 2 3 4 5 6 7 8 9
Sample Includes: ALL ADMISSIONS / SUBSET OF ALL ADMISSIONS

Pt #	A. Admit via	B. MedRec Performed	C. BPMH >1 source	D. Actual Med use verified by Pt/Caregiver source	E. Each med has drug name, dose, strength, route, frequency on BPMH and Admission Orders	F. Every med in BPMH is accounted for in Admission Orders	G. Prescriber has documented rationale for 'Holds' and 'Discontinued' meds	H. Discrepancy communicated, resolved, and documented
1 VOID	EMERG, PRE-ADM, DIRECT, OTHER	YES, NO, NO MEDS	YES, NO, UNCLEAR	YES, NO, UNCLEAR, UNABLE TO PERFORM	YES, NO	YES, NO	YES, N/A, NO, UNCLEAR	YES, NO, UNCLEAR
2 VOID	EMERG, PRE-ADM, DIRECT, OTHER	YES, NO, NO MEDS	YES, NO, UNCLEAR	YES, NO, UNCLEAR, UNABLE TO PERFORM	YES, NO	YES, NO	YES, N/A, NO, UNCLEAR	YES, NO, UNCLEAR
3 VOID	EMERG, PRE-ADM, DIRECT, OTHER	YES, NO, NO MEDS	YES, NO, UNCLEAR	YES, NO, UNCLEAR, UNABLE TO PERFORM	YES, NO	YES, NO	YES, N/A, NO, UNCLEAR	YES, NO, UNCLEAR
4 VOID	EMERG, PRE-ADM, DIRECT, OTHER	YES, NO, NO MEDS	YES, NO, UNCLEAR	YES, NO, UNCLEAR, UNABLE TO PERFORM	YES, NO	YES, NO	YES, N/A, NO, UNCLEAR	YES, NO, UNCLEAR
5 VOID	EMERG, PRE-ADM, DIRECT, OTHER	YES, NO, NO MEDS	YES, NO, UNCLEAR	YES, NO, UNCLEAR, UNABLE TO PERFORM	YES, NO	YES, NO	YES, N/A, NO, UNCLEAR	YES, NO, UNCLEAR

FAX Form in FINE Resolution NO COVER PAGE
1-877-846-5153
974520000582
2048-660049

13. **Appendix L**

14. Additional Resources and References

Business case for medication reconciliation

- An Excel spreadsheet template to calculate a MedRec Return on Investment (to justify MedRec related FTEs). http://www.ashp.org/Import/PRACTICEANDPOLICY/PracticeResourceCenters/PatientSafety/ASHPMedicationReconciliationToolkit_1/MedicationReconciliationBasics.aspx
- http://tools.patientsafetyinstitute.ca/Communities/MedRec/Shared%20Documents/Forms/All%20Documents.aspx?RootFolder=%2FCommunities%2FMedRec%2FShared%20Documents%2FImplementation%20Tools%20and%20Resources%2FBusiness%20Cases
- Society of Hospital Medicine. MARQUIS Implementation Manual Guide for Medication Reconciliation Quality Improvement. Appendix 1. Making the Business Case for Medication Reconciliation. http://tools.hospitalmedicine.org/resource_rooms/imp_guides/MARQUIS/marquis.html
- Agency for Healthcare Research and Quality. Chapter 1. Building the Project Foundation: Gaining Leadership Support Within the Organization. Medications at Transitions and Clinical Handoffs (MATCH) Toolkit for Medication Reconciliation.http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/match/match1.html
- Building a case for medication reconciliation. ISMP Medication Safety Alert 10 (8), April 21, 2005. http://www.ismp.org/Newsletters/acutecare/articles/20050421.asp
- The case for medication reconciliation. Nursing Management 2005; 36(9):22.
- An Excel spreadsheet template to calculate a Medication reconciliation Return on Investment (to justify Medication reconciliation related FTEs).http://www.ashp.org/Import/PRACTICEANDPOLICY/PracticeResourceCenters/PatientSafety/ASHPMedicationReconciliationToolkit_1/MedicationReconciliationBasics.aspx

Consumer Involvement

- **Consumer Information Sheet: Mistakes Can Happen with Your Medicines**. Australian Commission on Safety and Quality in Health Care. http://www.safetyandquality.gov.au/our-work/medication-safety/medication-reconciliation/
- **MATCH UP Medicines**. Australian Commission on Safety and Quality in Health Care. http://www.safetyandquality.gov.au/our-work/medication-safety/medication-reconciliation/
- **Medication errors involving reconciliation failures**. USP Patient Safety CAPSLink, October 2005. http://www.usp.org/hqi/practitionerPrograms/newsletters/capsLink/#archives

Education and training

- Australian Pharmaceutical Advisory Council. **Guiding principles to achieve continuity in medication management.** Canberra. Commonwealth of Australia. 2005.
- ISMP Canada Open Access Web-Based MedRec Learning Modules http://www.ismp-canada.org/medrec/#modules
- **Getting it Right! Taking a Best Possible Medication History training video**. Australian Commission on Safety and Quality in Health Care. http://www.safetyandquality.gov.au/our-work/medication-safety/medication-reconciliation/

General

- NICE: **NPSA Guidance: Technical patient safety solutions for medicines reconciliation on admission of adults to hospital** http://www.nice.org.uk/guidance/index.jsp?action=byID&o=11897
- Institute of Medicine, Report Brief: **Preventing Medication Errors – Quality Chasm Series** http://www.iom.edu/Object.File/Master/35/943/medication%20errors%20new.pdf
- **Reconcile medications at all transition points**. Institute for Healthcare Improvement, Patient Safety, Medication Systems, Changes. http://www.ihi.org/IHI/Topics/PatientSafety/MedicationSystems/Changes/Reconcile+Medications+at+All+Transition+Points.htm
- **SHPA Standards of Practice for the Provision of Medication Reconciliation**. *Journal of Pharmacy Practice and Research.2007;*37:231-233
- **A safer place for patients: learning to improve patient safety**. National Audit Office, 2005. http://www.nao.org.uk/pn/05-06/0506456.htm
- **Safer System Saving Lives campaign advice and tools for implementing processes of medication reconciliation**. http://www.health.vic.gov.au/sssl/downloads/prev_adverse_drug.pdf.
- Seamless Care Task Force of the Canadian Pharmacists Association and the Canadian Society of Hospital Pharmacists. **Statement on Seamless Care**. Ottawa (ON): Canadian Society of Hospital Pharmacists, 2004
- **Using medication reconciliation to prevent errors**. Sentinel Event Alert, The Joint Commission. Issue 35, January 23, 2006. http://www.jointcommission.org/SentinelEvents/SentinelEventAlert/sea_35.htm
- http://tools.patientsafetyinstitute.ca/Communities/Medicationreconciliation/Shared%20Documents/Forms/All%20Documents.aspx?RootFolder=%2FCommunities%2FMedicationreconciliation%2FShared%20Documents%2FImplementation%20Tools%20and%20Resources%2FBusiness%20Cases

Goals and standards

- **2006 National Patient Safety Goals**. The Joint Commission. http://www.jointcommission.org/PatientSafety/NationalPatientSafetyGoals/06_npsg_cah.htm
- **2009 National Patient Safety Goals.** The Joint Commission. http://www.jointcommission.org/NR/rdonlyres/868C9E07-037F-433D-8858-0D5FAA4322F2/0/RevisedChapter_HAP_NPSG_20090924.pdf
- Canadian Council on Health Services Accreditation. **CCHSA Patient Safety Goals and Required Organizational Practices.** http://www.cchsaccass.ca/upload/files/pdf/Patient%20Safety/PS%20ROP%20version%202%201%20for%202007%20E.pdf
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- Agency for Healthcare Research and Quality. Medications at Transitions and Clinical Handoffs (MATCH) Toolkit for Medication Reconciliation. http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/match/index.htiml
- Institute for Health Care improvement. **Medication Reconciliation: A Guide for Health Care Providers.** http://www.ihi.org/IHI/Topics/PatientSafety/MedicationSystems/Tools/MedicationreconciliationGuideforProviders.htm
- Safer Healthcare Now! **Medication Reconciliation Getting Started Kit** http://www.saferhealthcarenow.ca/EN/Interventions/medication reconciliationacute/Pages/gsk.aspx
- Examples of medication reconciliation tools designed for use in Australia http://www.cec.health.nsw.gov.au/toolkits/SSSL.html#adversedrugevents
- North Western Memorial Hospital **MATCH Mediation Reconciliation Toolkit** http://www.medicationreconciliation.nmh.org/nm/for+physicians+match
- Australian Commission on Safety and Quality in Health Care. National Medication Management Plan and support materials. http://www.safetyandquality.gov.au/our-work/medication-safety/medication-reconciliation
- **Massachusetts Coalition for the Prevention of Medical Errors.** www.macoalition.org/initiatives.shtml

Measurement

- Canadian Patient Safety Institute, ISMP Canada. Canadian Admission Quality Audit Tool. This tool allows organizations to assess the overall quality of their established admission Medication reconciliation processes in acute and long term care settings. Using a "checklist" approach, this tool allows organizations to audit individual patient charts to assess whether the steps of the Medication reconciliation process led to the desired outcomes. Through aggregation of this data, organizations can identify specific aspects of the overall admission process where they are doing well and others that require organizational attention. A copy of the tool is provided in Appendix K.
- **A Novel Tool to Assess the Quality of Admission *MedRec* Processes.** www.saferhealthcarenow.ca/EN/events/NationalCalls/2013/Documents/2...
- ***MedRec* Quality Audit Workbook – Communities of Practice Tools** http://www.saferhealthcarenow.ca/EN/events/NationalCalls/2013/Documents/
- http://www.saferhealthcarenow.ca/EN/events/NationalCalls/2013/Documents/2013-06-18%20-%20MedRec/MedRec%20Quality%20Audit%20Tool.pdf

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15. End Notes

Appendix M

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