Reducing Harm | Improving Healthcare | Protecting Canadians

MEDICATION RECONCILIATION IN ACUTE CARE

Getting Started Kit

Version 4

Effective March 14, 2019, the Canadian Patient Safety Institute has archived the Medication Reconciliation (MedRec) intervention. For additional inquiries, please contact info@cpsi-icsp.ca

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This Getting Started Kit has been written to help engage inter-professional/interdisciplinary teams in a dynamic approach for improving quality and safety. The Getting Started Kit represents the most current evidence, knowledge and practice, as of the date of publication and includes what has been learned since the first kit was released in 2005. We remain open to working consultatively on updating the content, as more evidence emerges, as together we make healthcare safer in Canada.

Note:

The Getting Started Kit used in Quebec is the same and available in both French and English.

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The Institute for Safe Medication Practices Canada (ISMP Canada) leads the national medication reconciliation strategy and led the development of this Getting Started Kit

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We wish to thank and acknowledge the following individuals who have contributed significantly to the revisions to this kit.

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Table of Contents

The Goal of the Getting Started Kit: Medication Reconciliation

The Getting Started Kit provides support to start the process on small numbers of patients, make changes, and gradually develop, implement and evaluate medication reconciliation broadly using quality improvement processes. This updated Getting Started Kit includes current evidence for medication reconciliation on admission, internal transfer and discharge.

In this Getting Started kit the following icons will be used:

Guiding Principles

Reminders

Tips

Frequently Asked Questions

Glossary of Terms

In this Getting Started Kit the following terms will be used.

Admission Medication Orders (AMOs): Prescriber-recorded admission medication orders documented within 24 hours from the time of admission to a healthcare facility. A time frame of 24 hours is preferred for clarification of admission medication orders (i.e., permitting normal processes of care to correct problems occurring at the time of admission). These normal processes would include clinical pharmacist clarification of unclear admission medication orders.

Adverse Drug Event (ADE): An injury from a medicine or lack of an intended medicine; includes adverse drug reactions and harm from medication incidents.[1]

Best Possible Medication History (BPMH): A BPMH is a history created using:

1) a systematic process of interviewing the patient/family; and
2) a review of at least one other reliable source of information to obtain and verify all of a patient's medication use (prescribed and non-prescribed).

Complete documentation includes drug name, strength (if applicable), dosage, route and frequency. The BPMH is more comprehensive than a routine primary medication history which is often a quick preliminary medication history which may not include multiple sources of information.

Best Possible Medication Discharge Plan (BPMDP): Accounts for the medications that the patient was taking prior to admission (BPMH) to acute care, the most current medication list, and any new medications planned to start upon discharge. The best possible medication discharge plan (BPMDP) should be communicated to the patient, community physician, community pharmacy and alternative care facility or service. This may include:

- An up-to-date and accurate list of medications the patient should be taking on discharge.
- A medication information transfer letter to the next care provider which includes rationale for the medication changes.
- A structured discharge prescription to the next care provider or community pharmacist
- A patient medication schedule and/or wallet card.

Full Implementation: The processes, procedures and practices are refined and finalized and have led to significant improvement. All team members in selected units are consistently implementing the processes, procedures and practices and continue to monitor and maintain their sustained performance which remains at or close to goal. They achieved their aim and are ready for spread to other units.

Intentional Discrepancies: An *intentional discrepancy* is one in which the prescriber has made an intentional choice to add, change or discontinue a medication and their choice is clearly documented. This is considered to be 'best practice' in medication reconciliation.

Internal Transfer: Transfer is an interface where orders need to be reviewed and rewritten according to facility policy. These may include: change of service, change in level of care, post-operatively, transfer between units because of availability of beds.

Medication Reconciliation: A formal process in which healthcare providers work together with patients, families and care providers to ensure accurate and comprehensive medication information is communicated consistently across transitions of care. Medication reconciliation requires a systematic and comprehensive review of all the medications a patient is taking to ensure that medications being added, changed or discontinued are carefully evaluated. It is a component of medication management and will inform and enable prescribers to make the most appropriate prescribing decisions for the patient.

Medication Management: is an overarching concept that describes the delivery of patient-centred care to optimize safe, effective and appropriate drug therapy. Care is provided through collaboration with patients and their healthcare teams.[1]

Non-Prescribed Medication: The term 'Non-Prescribed Medication' will be used for all medications not prescribed by a healthcare practitioner and *may* include over-the counter (OTC) medications, nutritional supplements, vitamins, natural health products, or recreational drugs.

Prescribed Medication: The term 'Prescribed medication' will be used for medications that are prescribed by a healthcare practitioner. Prescribed medications includes all prescription drugs (as defined by each provincial pharmacy act), may include over-the-counter drugs (e.g. ASA) and vitamins (e.g. calcium supplements).

Primary Medication History (PMH): An initial medication history taken at the time of admission, generally by a prescriber or nurse. Various sources of information may be used to obtain the PMH, including patient/family interviews, review of medication lists/vials, or follow-up with the community pharmacy or family physician.[2]

Seamless Care: The desirable continuity of care delivered to a patient in the health care system across the spectrum of caregivers and their environments.[3]

Senior Leadership: A senior leader is a person defined by an organization (e.g. Vice-president) that can remove obstacles and allocate resources.

Undocumented Intentional Discrepancies: 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. Undocumented intentional discrepancies are a failure to document. They are not medication errors and do not usually represent a serious threat to patient safety. *Undocumented intentional discrepancies* may however lead to confusion, require extra work and may lead to medication errors. They can be reduced by standardizing the method for documenting admission medication orders. *Undocumented intentional discrepancies* represent 25 to 75 per cent of all discrepancies.

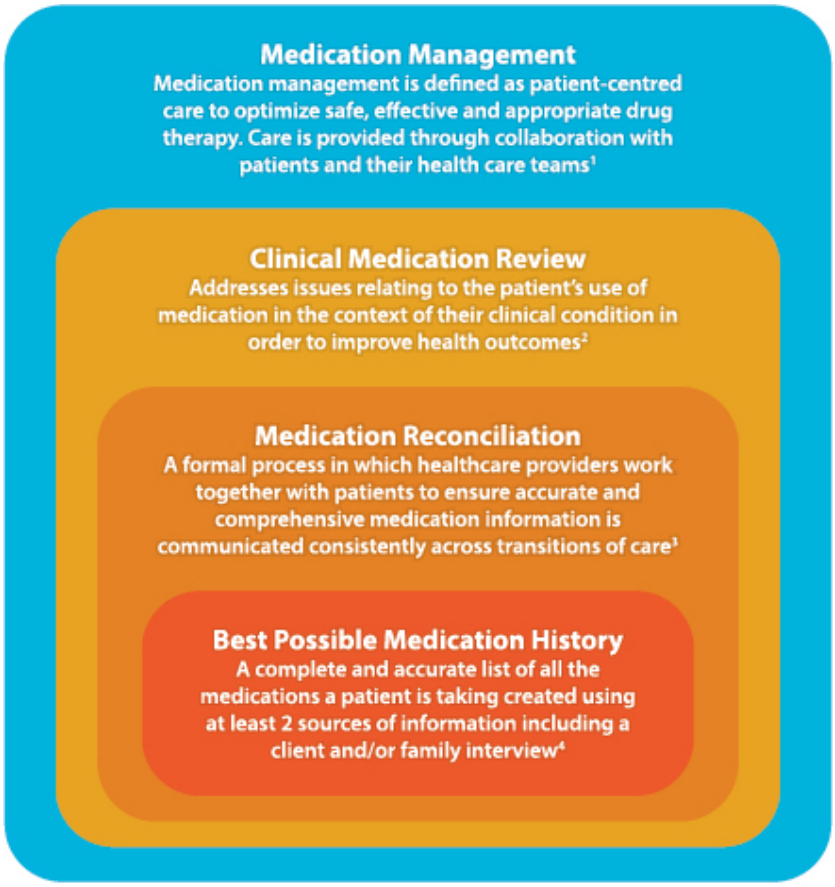
Unintentional Discrepancy: An *unintentional discrepancy* is one in which the prescriber unintentionally changed, added or omitted a medication the patient was taking prior to admission. Unintentional discrepancies are potential medication errors than can lead to ADEs. They can be reduced by ensuring good training of nurses/prescribers/pharmacists at obtaining in-depth medication histories and by wisely involving clinical pharmacists to identify and reconcile these discrepancies. In institutions without access to clinical pharmacists, reconciliation of discrepancies can be assigned to other healthcare professionals.

Overview of Medication Reconciliation

What is Medication Reconciliation?

Medication reconciliation is a formal process in which healthcare providers work together with patients, families and care providers to ensure accurate and comprehensive medication information is communicated consistently across transitions of care.

Medication reconciliation requires a systematic and comprehensive review of all the medications a patient is taking to ensure that medications being added, changed or discontinued are carefully evaluated. It is an **essential component of medication management** and will inform and enable prescribers to make the most appropriate prescribing decisions for the patient. An understanding of the patient's actual medication use is a pre-requisite to safe medication management.



1. Developed collaboratively by the Canadian Pharmacists Association, Canadian Society of Hospital Pharmacists, Institute for Safe Medication Practices Canada, and University of Toronto Faculty of Pharmacy, 2012.
2. www.health.gov.bc.ca/pharmacare
3. ISMP Canada. Medication Reconciliation in Acute Care: Getting Started Kit. 2011
4. ISMP Canada. Medication Reconciliation in Acute Care: Getting Started Kit. 2011

Adapted from Fraser Health, Providence Health Care, Provincial Health Services Authority, Vancouver Coastal Health

In recognition of the importance of this initiative, the implementation of medication reconciliation is required by Accreditation Canada. Please visit www.accreditation.ca for more information on Accreditation Canada Required Organizational Practices.

The Case for Medication Reconciliation

It is well known that adverse drug events (ADEs) occur with disturbing frequency, and that communication problems between settings of care are a significant factor in their occurrence.

In the Canadian Adverse Events Study, drug and fluid related events were the second most common type of procedure or event to which adverse events were related.[4] Moreover, chart reviews have revealed that over half of all hospital medication errors occur at the interfaces of care.[5]

At Admission

- A large 2011 study found that patients admitted to hospital were at increased risk for the unintentional discontinuation of chronic evidence based therapies as compared to controls. There was an even greater risk of unintentional discontinuation of these medications following an ICU admission.[6] [Level IV]
- A 2005 study conducted in a Canadian institution found that 54 per cent of the study population had at least one unintended medication discrepancy, of which 39 per cent were judged to have the potential to cause moderate to severe discomfort or clinical deterioration. The most common discrepancy (46 per cent) consisted of the omission of a regularly used medication.[2] [Level VI]

At Transfer

- In a 2010 Canadian study, 62 per cent of the study population had at least one unintentional medication discrepancy at the time of transfer, and the most common discrepancy was medication omission (55.6 per cent). Factors that independently increased the risk of a patient experiencing at least one unintentional discrepancy included lack of best possible medication history, increasing number of home medications, and increasing number of transfer medications. Forty-seven patients (36.4 per cent) had at least one unintentional discrepancy with the potential to cause discomfort and/or clinical deterioration.[7] [Level VI]

At Discharge

- Forster et al. followed 361 patients discharged from a general internal medicine service at a Canadian teaching hospital to independent or residential living to determine the risk, severity and type of adverse events (AEs) after discharge. The physician reviewers determined that 72 patients (23 per cent) experienced an AE post-discharge. Of all AEs, 72 per cent were medication related, and the majority were considered either preventable or ameliorable. The authors concluded that improved monitoring and communication with community care providers is needed to improve safety after discharge.[8] [Level VI]

- A 2015 study by Scales et al. documented the risk of unintentionally continuing medication intended for acute illness post-discharge and subsequent costs to the health care system for such unindicated treatments. Although the percentage of continued use ranged from 1.4 per cent for antipsychotics, to 6.1 per cent for gastric acid suppressants, the absolute numbers were significant enough to cost $18 million CAD for the study cohorts.[9] [Level IV]

The Impact of Medication Reconciliation

The literature regarding the potential impact of medication reconciliation continues to expand. The reconciling process has been demonstrated to be a powerful strategy to reduce ADEs as patients move from one level of care to another.

Overview

Pharmacy-led MedRec at admission or discharge shown to reduce medication discrepancies

- A 2016 systematic review of 19 studies (11 of which were RCTs), showed pharmacy-led medication reconciliation interventions to be an effective strategy to reduce medication discrepancies. Greater impact was found when MedRec was conducted at either admission or discharge, but lesser during multiple transitions in care. Further studies that are designed to assess the impact of the involvement of pharmacy technicians in medication reconciliation are also needed.[10] [Level I]

Pharmacist-led MedRec showed reduced rate of all cause readmissions, all cause ED visits, and ADE-related hospital interventions

- A 2016 systematic review of 17 studies (eight of which were RCTs), showed pharmacist-led medication reconciliation programmes to have clinical impact – a substantial reduction in the rate of all-cause readmissions (19 per cent), all-cause ED visits (28 per cent) and ADE-related hospital revisits (67 per cent). However, the effect on mortality and composite all-cause readmission/ED visit is inconclusive based on the current evidence. Further research is needed, with robust, large RCTs of excellent quality to confirm conclusions.[11] [Level I].

At Admission

Reduces ADEs

- A 2011 study revealed that medication reconciliation at admission led to a 43 per cent reduction in actual ADEs caused by errors in admission orders.[12] [Level VI]

Intercepts clinically important discrepancies before patients are harmed

- A study by Vira et al, 60 per cent of their prospectively enrolled patients had at least one unintended variance (discrepancy) and 18 per cent had at least one clinically important variance identified at the time of admission. None of the variances had been detected by usual clinical practice before reconciliation was conducted. Of the

20 clinically important variances, a medication reconciliation process intercepted 75 per cent of the variances before patients were harmed.[13] [Level IV]

Pharmacy technicians can obtain BPMHs

- A Canadian institution studied the ability of pharmacy technicians to obtain medication histories relative to that of pharmacists. This study showed that trained pharmacy technicians were able to obtain a BPMH for patients in the emergency department with as much accuracy and completeness as pharmacists.[14] [Level VI]

Variables associated with patient ADEs are identified in ER

- A 2012 study by Hohl et al. identified variables associated with patient ADEs to develop clinical decision rules, thereby facilitating detection of at-risk patients who would benefit most from a pharmacist-led medication review. The factors were ≥ 1 comorbid condition, antibiotics in the past seven days, a change in medication in the past 28 days, arrival by ambulance or triaged CTAS 1-3, hospital admission in the past month, a history of renal failure or serum creatinine ≥ 150, or taking ≥ 3 prescription medications.[15] [Level IV]

At Discharge

The medication management role of the clinical pharmacist is beneficial at reducing medication discrepancies at discharge

- A 2016 study by Alex et al. established the benefit of a clinical pharmacist as a part of the healthcare team, in addition to the error-reducing electronic health records and computerized physician order entry. The pharmacist's medication management role resulted in 93.8 per cent of discharges having no medication discrepancies within 72 hours – as compared to 40.2 per cent in the control group without a dedicated pharmacist.[16] [Level II]

Pharmacist discharge services reduces medication discrepancies

- A 2010 study by Eggink et al. demonstrated a significant reduction in the risk of medication discrepancies and prescription errors in heart failure patients within the first month post-discharge. The intervention of pharmacist discharge services – including medication review, communication with the cardiologist, patient counselling, etc. – led to a relative risk reduction of 57 per cent for medication discrepancies, and 42% for prescription errors.[17] [Level I]

MedRec at discharge decreases medication discrepancies

- In a 2009 study comparing medication discrepancies at discharge, an intervention including medication reconciliation at discharge decreased medication discrepancies identified at discharge by 26 per cent as compared to a control group who did not receive medication reconciliation[18]. [Level II]

Pharmacists identified medication discrepancies which can impact length of hospital stay

- In a prospective observational study, pharmacists found 41 per cent of patients had at least one medication discrepancy, and patients who were on eight or more medications on discharge to have an associated increased risk of discrepancy (OR 8.5,

p <0.001, 95% CI 2.8,25.5). The length of stay was significantly longer in patients with discrepancies vs. those without (6.0 vs. 4.3 days, respectively, p = 0.017). Pharmacist identified medication discrepancies in two out of every five patients discharged during the study, demonstrating the need for consistent pharmacist intervention at this transition-of-care.[19] [Level VI]

MedRec intensity categorized from Bronze to Diamond depending on patient characteristics

- In a Canadian review article, Fernandes looked at the evidence for MedRec at discharge and categorized them according to the levels of intensity as seen in published studies. The levels used were described by their key components ranging from bronze to diamond.[20] [Level VII]

MedRec and other transition interventions are helpful and beneficial from the patient's perspective

- In a 2015, randomized controlled study demonstrated that the majority of patients indicated it was "very helpful" to speak with a pharmacist about their medications before discharge (72.8 per cent), particularly about how to take the medications, and how to prevent and manage side effects. Receiving an illustrated medication list (69.6 per cent) and follow-up phone call after discharge (68.0 per cent) were also considered very helpful. Patients indicated that this intervention had an enduring effect, and reported feeling more comfortable discussing their medications with outpatient providers after discharge.[21] [Level II]

MedRec at admission and discharge identified as clinical pharmacy KPIs for hospital pharmacists

- A consensus of the clinical pharmacy key performance indicators (cpKPIs) for pharmacy care provided to inpatients in Canada defined two out of eight cpKPIs related to medication reconciliation. cpKPI medication reconciliation on admission and MedRec at discharge looking at the proportion of patients who received documented MedRec (as well as resolution of identified discrepancies), performed by a pharmacist.[22] [Level VII]

MedRec at discharge amongst a suite of interventions has shown a benefit on patient outcomes

- Due to limited evidence, it is not possible to draw any conclusions about the effect of medication reconciliation alone, on patient outcomes. However, MedRec performed amongst a suite of interventions at discharge has shown benefit.[23] [Level I]

On Readmission

Pharmacist intervention including MedRec reduced readmissions

- In an academic medical centre in southern Arizona, pharmacist attended interdisciplinary discharge coordination meetings, coordinated/facilitated discharge prescription order with physicians, facilitated the filling of medications and provided patient education on discharge medications. Pharmacists performed medication

reconciliation once a discharge order was in place. Pharmacist interventions resulted in significantly reduced numbers of readmissions compared to the control year (25 vs. 27.5, respectively, p = 0.0369).[24] [Level III]

Collaboration between discharge nurse and transitional care pharmacist reduced readmission rates

- In a four year project to reduce all-cause 30 day readmission rates, investigators at Massachusetts General Hospital found that after the introduction of a discharge nurse and a transitional care pharmacist, there was a reduction in readmission rates by 30 per cent (21 per cent pre-intervention to 14.5 per cent post intervention, p <0.05).[25] [Level III]

Co-ordination of outpatient pharmacy services by inpatient pharmacist reduced 30 day readmission rates

- Patients who met certain criteria for medication reconciliation and patient education were identified during inpatient multidisciplinary rounds by a rounding pharmacist. Outpatient services for these patients were initiated when the patient was admitted and performed by advanced level pharmacy technicians. Pre-intervention, the 30 day readmission rate was 13.7 per cent (12 month fiscal year (FY) ending June 2011). After implementation in April 2011, the annual readmission rate declined to 11.3 per cent in FY 2012 and was 12.2 per cent in FY 2013.[26] [Level VI]

Impact of MedRec alone remains unclear, more research needed

- In a systematic review on 18 studies, authors found that focusing interventions on high risk patients (using common selection criteria) does not improve the effect of medication reconciliation. Of note, solely performing medication reconciliation probably did not reduce post-discharge hospital utilization. The effect of medication reconciliation on unplanned emergency department visits and readmissions was not clear and a longer duration of follow-up may be required to see these effects.[27] [Level I]

Performing MedRec closer to discharge date reduced the number of readmissions

- The 2014 Academy of Managed Care Pharmacy found that the closer discharge interventions performed by pharmacists were done to the actual discharge date, the greater the reduction in the number of readmissions.[28] [Level VI]

to

Complete, accurate, and up-to-date medication information is essential to ensure safe prescribing in any setting.

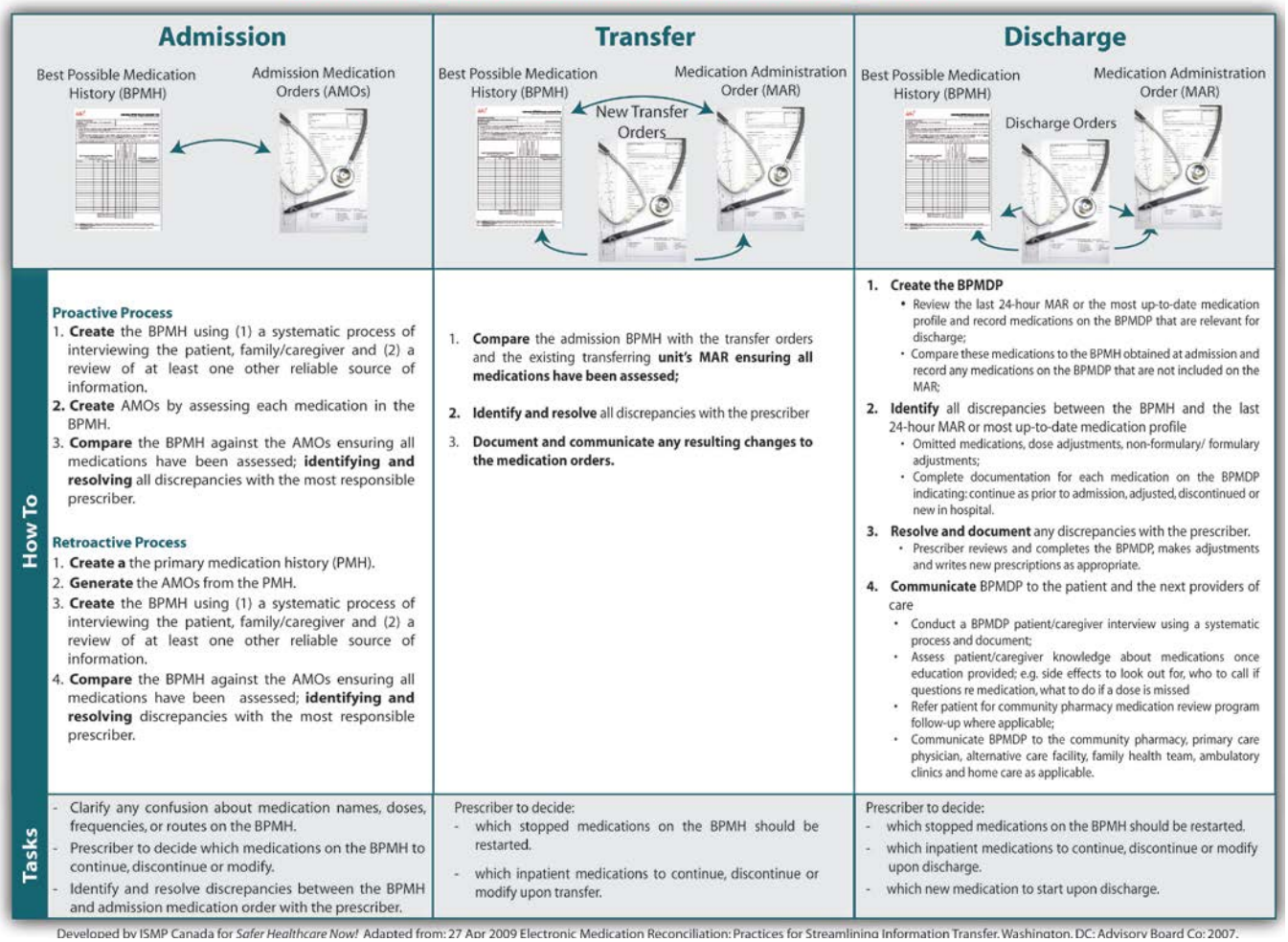
Levels of Evidence[29]	
Level I	Evidence from a systematic review of all relevant randomized controlled trials (RCT's), or evidence-based clinical practice guidelines based on systematic reviews of RCT's
Level II	Evidence obtained from at least one well-designed Randomized Controlled Trial (RCT)
Level III	Evidence obtained from well-designed controlled trials without randomization, quasi-experimental
Level IV	Evidence from well-designed case-control and cohort studies
Level V	Evidence from systematic reviews of descriptive and qualitative studies
Level VI	Evidence from a single descriptive or qualitative study
Level VII	Evidence from the opinion of authorities and/or reports of expert committees

Medication Reconciliation Process in Acute Care

1. **Create a complete and accurate Best Possible Medication History (BPMH)** of the patient's medications including name, dosage, route and frequency. This includes:
   - a systematic process of interviewing the patient/family and
   - a review of at least one other reliable source of information;
2. **Reconcile medications:** Use the BPMH to create admission orders or compare the BPMH against admission, transfer or discharge medication orders; identify and resolve all differences or discrepancies; and
3. **Document and communicate** any resulting changes in medication orders to the patient, family/caregiver and to the next provider of care.

Ultimately, the goal of MedRec is to provide accurate and complete medication information throughout transitions of care (e.g. admission, internal transfer, discharge) to reduce the potential for adverse drug events (ADEs).

Medication Reconciliation (MedRec) is a Multi-Step Process



Developed by ISMP Canada for *Safer Healthcare Now!* Adapted from: 27 Apr 2009 Electronic Medication Reconciliation: Practices for Streamlining Information Transfer. Washington, DC: Advisory Board Co: 2007.

STEP 1: Creating the Best Possible Medication History (BPMH)

Studies have found the majority of unintentional discrepancies which may lead to medication errors originated in obtaining patients' medication histories. The process relies heavily on clinicians' interview skills, patients' ability to participate, and access to patients' outpatient medication lists or community pharmacy dispensing records.[8] This section will help clinicians understand how to use a systematic process to obtain the BPMH.

Definition

A **Best Possible Medication History (BPMH)** is a history created using:

1. a systematic process of interviewing the patient/family; and
2. a review of at least one other reliable source of information to obtain and verify all of a patient's medication use (prescribed and non-prescribed).

Complete documentation includes drug name, strength (if applicable), dosage, route and frequency. The BPMH is more comprehensive than a routine primary medication history which is often a quick preliminary medication history which may not include multiple sources of information. **The BPMH is the cornerstone of the medication reconciliation process.**

BPMH versus a Primary Medication History

Primary Medication History is often:	BPMH is:
Created quickly to capture a list of medications (e.g. at triage)	Created using a systematic process and is a more thorough medication history (e.g. at admission)
Created using only a single source of information e.g. patient interview only, electronic provincial medication record only	Created by interviewing the patient (where possible) and using at least one additional source of information e.g. electronic medication dispensing record, medication vials, referring healthcare facilities MAR, community pharmacy records
Missing necessary and/or essential elements of medication information. This can be unsafe to use when creating medication orders	A **complete and accurate** list of medications that reflects medication use prior to admission which can be used to safely create (and later re-assess) medication orders

What medications should be included in the BPMH?

In general, a patient's current regularly used or as needed (prn):

- Prescribed drugs (may include prescribed over-the-counter (OTC) medications)
- Non-prescribed drugs which may include over-the counter (OTC) medications, vitamins, herbal/natural health products, or recreational drugs.

Organizations should define what will be included in the BPMH as is relevant in their setting. In general, blood products, medical gases, nutritional supplements, vaccinations, and IV solutions are excluded from the BPMH.

The BPMH is a 'snapshot' of the patient's actual medication use, which may be different from what is contained in their records. This is why the patient involvement is vital.

An up-to-date, complete, and accurate medication information is essential to ensure safe prescribing in any setting.

When should the Best Possible Medication History (BPMH) be obtained?

Once the decision to admit the patient has been made, it is recommended that the BPMH be completed as soon as possible. In general, the entire medication reconciliation process should be completed within 24 hours from the time of the decision to admit. However, each team will need to determine what best practice is for them.

Who should obtain the Best Possible Medication History (BPMH)?

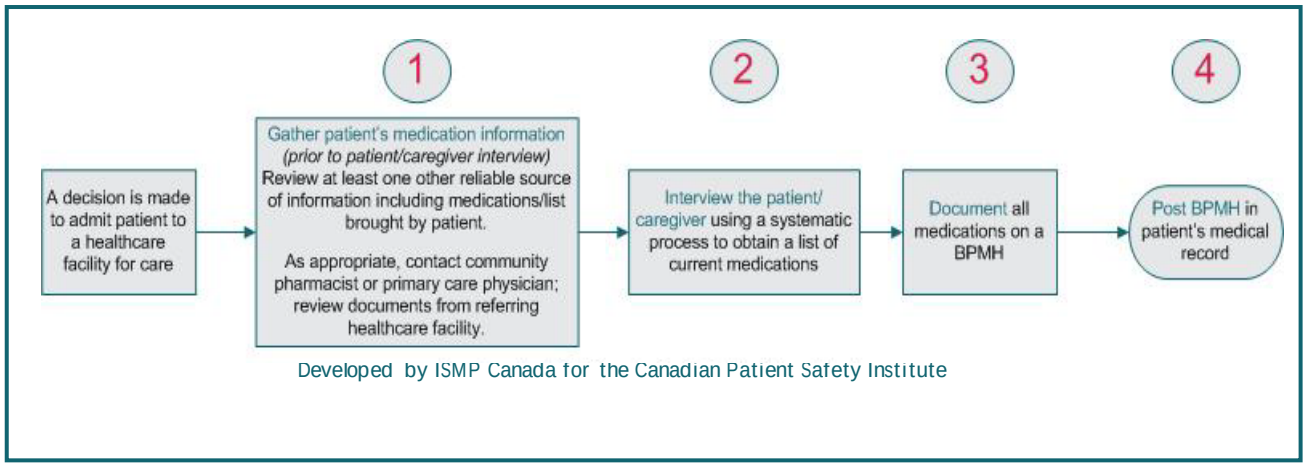
The person collecting the Best Possible Medication History should be a healthcare professional (e.g. doctor, nurse, nurse practitioner, or pharmacist) whose scope of practice includes this activity and who:

1. Receives training on how to create a Best Possible Medication History;
2. Follows a systematic process such as a BPMH interview guide where possible; and
3. Are conscientious, responsible and accountable for conducting the medication history process.

Collection of the BPMH may be delegated to other healthcare providers (e.g. pharmacy technicians, paramedics) provided the organization maintains a training and quality assurance program to support this activity.

How to complete a BPMH

Flow Map for Creating a BPMH



1 ***Gather patient's medication information***. Not all sources of information are equally useful. Consider the limitations and potential benefits of each source that you use. (Refer to FAQ: What are the potential benefits and limitations of the sources of information for the BPMH?)

Initial Sources of Medication Information

Type of Admission	Sources of Information
From the Community/ Home Care	• Electronic provincial medication record • Medication vials/community pharmacy records • Patient own medication list (paper or electronic) • Prescriber referral/consultation notes • Previous admission records/discharge medication information • Home care reconciled medication list • Ambulatory clinic medication records
From a Long-Term Care facility or another healthcare facility	• Most current Medication Administration Record (MAR) • Best Possible Medication Discharge Plan (BPMDP) / discharge medication information from another healthcare facility • Pharmacy records/medication profile

When reviewing medication records, how far back in the medication history do you look?

It is recommended that for community pharmacy and other electronic records that clinicians review the records from **at least the last six months**. The purpose of the BPMH is to capture what the patient was taking just prior to the admission, but you may need to look back six months to understand the history of medication changes and the patient's unique prescription filling habits.

Patients will often use more than one pharmacy to obtain their medications. Ask about multiple pharmacies.

2

Interview the patient/caregiver using a ***systematic process*** to identify patient's **actual** use of medications not simply what has been identified in the initial sources. For example, if the medications are on-site, open each vial and ask the patient "How do you take/use these?" During this process, compare and verify the information from this interview with at least one additional source of information.

In situations when the patient or family caregiver is not able to provide information (e.g. acute delirium, coma, low level of health literacy, language barrier) it is prudent to use as many additional sources of information as possible. Notify the prescriber that actual medication use could not be verified and document this in the patient's health record.

The BPMH Interview Guide is designed to include questions needed to take a complete and accurate medication history, using open and close ended questions. It is a comprehensive list of questions to ask the patient. The back cover uses effective prompts such as visual aids to support the interview process. Copies of the guide are available from the Canadian Patient Safety Institute and ISMP Canada.

What if there are differences within the sources of medication information?

The most common situation where this may arise is where patients are non-adherent to a prescribed medication. We suggest the following approach:

- **Discuss** these identified differences with the patient/caregiver and/or investigate further.

- **Communicate** the specific nature of the differences to facilitate resolution by the most responsible prescriber. This communication may be done directly through conversation with the prescriber, through a chart note to the prescriber or through use of a "comments" section on a BPMH form.
- **Document** on the BPMH what the patient is actually taking to help the prescriber make an informed decision based on what is best for the patient.

When patients are admitted from long-term care or another facility where patients are not usually responsible for their own medication administration, the facility MAR or medication profile should be used to create the BPMH. In situations where the MAR documentation is in question, the facility or the long-term care pharmacy would be an appropriate alternative source of information.

3

Document all medications including name, dosage, route, and frequency on the BPMH.

It is up to the organization to adapt or develop BPMH tools/forms to support the medication reconciliation process.

Keep the BPMH **in a highly visible, central location in the patients' chart** (whether electronic or paper-based) for all healthcare professionals to access.

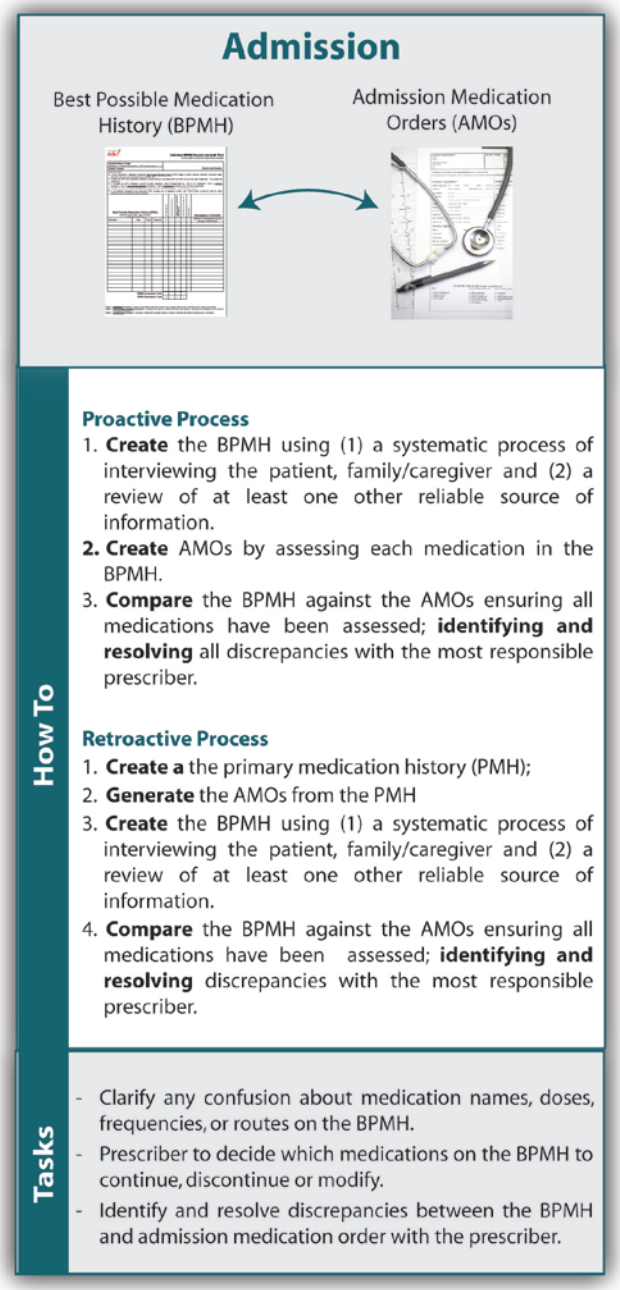
STEP 2: Reconciling the Medication

STEP 3: Documenting and Communicating

Medication Reconciliation at Admission

The goal of reconciliation on admission is to ensure there is clear communication about decisions the prescriber makes to continue, discontinue, or modify the medication regimen upon admission that the patient has been taking prior to admission. This next section will describe in detail the various models used to complete the reconciliation process at admission.

The overarching process at admission appears in the figure to the right. There are however, differing processes or models that have been developed to complete the admission reconciliation process.



Reconciliation Models

Admission medication reconciliation processes generally fit into two models: **proactive process** and **retroactive process**. The **proactive process** occurs when the BPMH is created **first** and is used to write admission medication orders (as shown graphically below).

Proactive Medication Reconciliation Process

1. **Create** the BPMH using a systematic process of interviewing the patient, family/caregiver and a review of at least one other reliable source of information;
2. **Create** admission medication orders (AMOs) by assessing each medication on the BPMH;
3. **Verify** every medication in the BPMH by **comparing** the BPMH against the AMOs ensuring all medications have been assessed; **identifying and resolving** all discrepancies with the most responsible prescriber.

Developed by ISMP Canada for the Canadian Patient Safety Institute

A **retroactive process** occurs when a BPMH is created and medications are reconciled after admission medication orders are written (as shown graphically below).

Retroactive Medication Reconciliation Process

1. **Create** a primary medication history (PMH);
2. **Generate** the admission medication orders (AMO's) from PMH;
3. **Create** the Best Possible Medication History (BPMH) using a systematic process of interviewing the patient, family/caregiver and a review of at least one other reliable source of information; and
4. **Compare** the BPMH against the AMOs ensuring all medications have been assessed; i**dentifying and resolving** all discrepancies with the most responsible prescriber.

Developed by ISMP Canada for the Canadian Patient Safety Institute

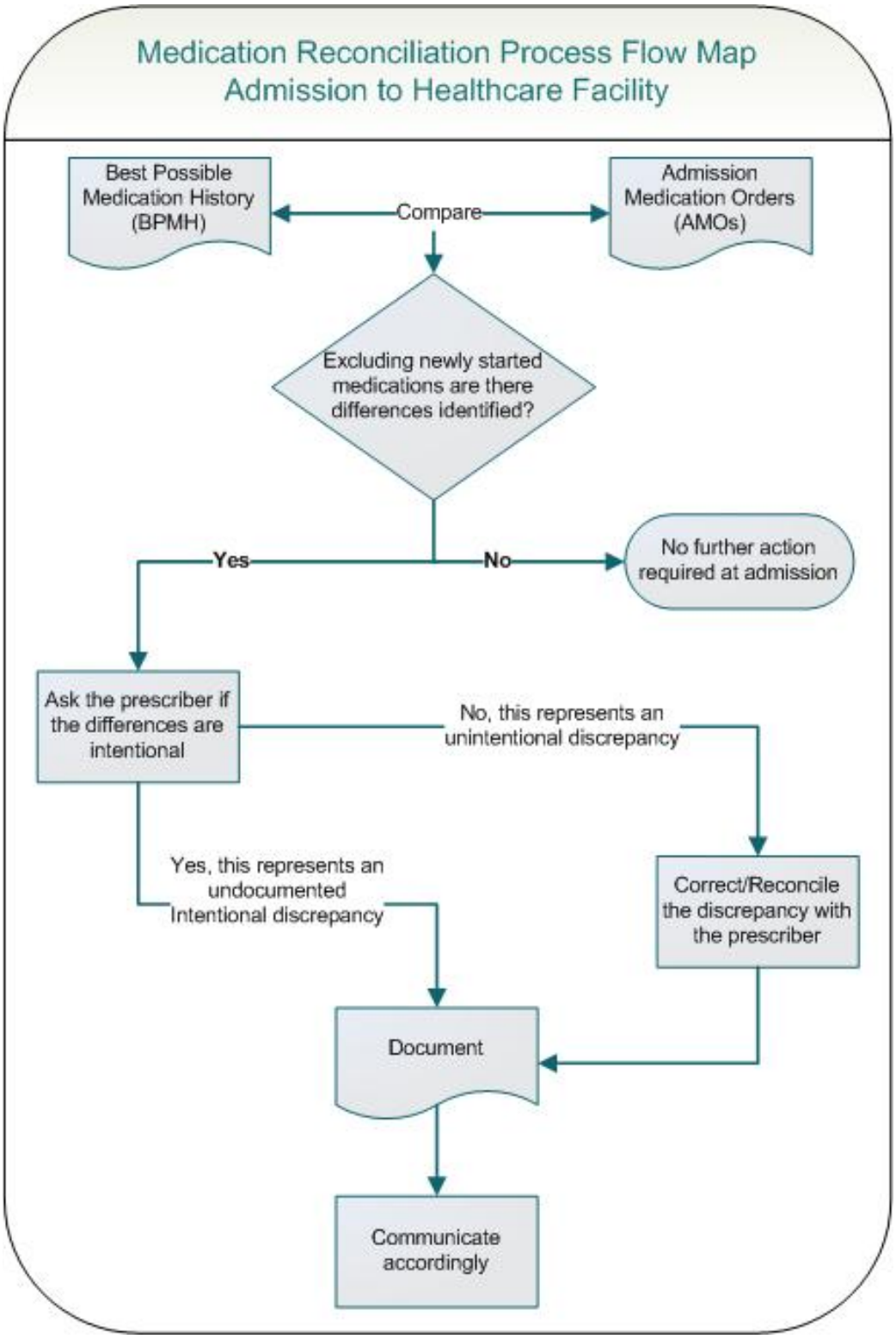
Improving the Primary Medication History

If a BPMH cannot be done prior to admission orders, there are other opportunities to improve the process of gathering the primary medication history. Improving the primary medication history will help reduce the number of unintentional discrepancies. (Examples: providing educational hands-on sessions to improve medication history taking and engaging the patient and their families in the process.)

Although it is desirable to have one reliable process, it may be necessary to have a combination based on complexity or staffing. For example, a proactive model may be in place on weekdays but a retroactive process may be used on evenings and weekends. Patients needing immediate treatment (e.g. patient trauma) will generally be reconciled retroactively. This combination of models is sometimes referred to as a "**mixed model**".

Proactive versus Retroactive or a Combination of Both?

- The proactive process is well-suited for small institutions where there are fewer admissions and for areas with planned admissions like the pre-admission clinic with highly skilled and trained clinicians dedicated to obtaining the BPMH.
- The retroactive process is suited to sites with high admission volumes that have difficulty obtaining a BPMH before admission orders are written. Reconciliation of the AMOs to the BPMH is necessary to identify and resolve any discrepancies.
- Larger institutions may have difficulty implementing a fully proactive model due to high admission volumes. A hybrid of both proactive and retroactive models may be needed to capture 'all' admissions.


Medication Reconciliation Process Flow Map
Admission to Healthcare Facility
Best Possible Medication History (BPMH)
Compare
Admission Medication Orders (AMOs)
Excluding newly started medications are there differences identified?
Yes
No
No further action required at admission
Ask the prescriber if the differences are intentional
No, this represents an unintentional discrepancy
Yes, this represents an undocumented Intentional discrepancy
Correct/Reconcile the discrepancy with the prescriber
Document
Communicate accordingly

Medication Reconciliation at Internal Transfer

Internal transfer is an interface of care associated with a change in patient status where it is required for medication orders to be re-written. The goal of medication reconciliation at internal transfer is to review the patient's current medication orders and reassess their preadmission medications (e.g. home medications, medications from a previous facility) to determine what should be continued, discontinued, restarted or changed.

Transfer is an interface of care where orders need to be reviewed and rewritten according to facility policy. This may include:

- Changes in responsible medical service
- Changes in level of care
- Post-operative

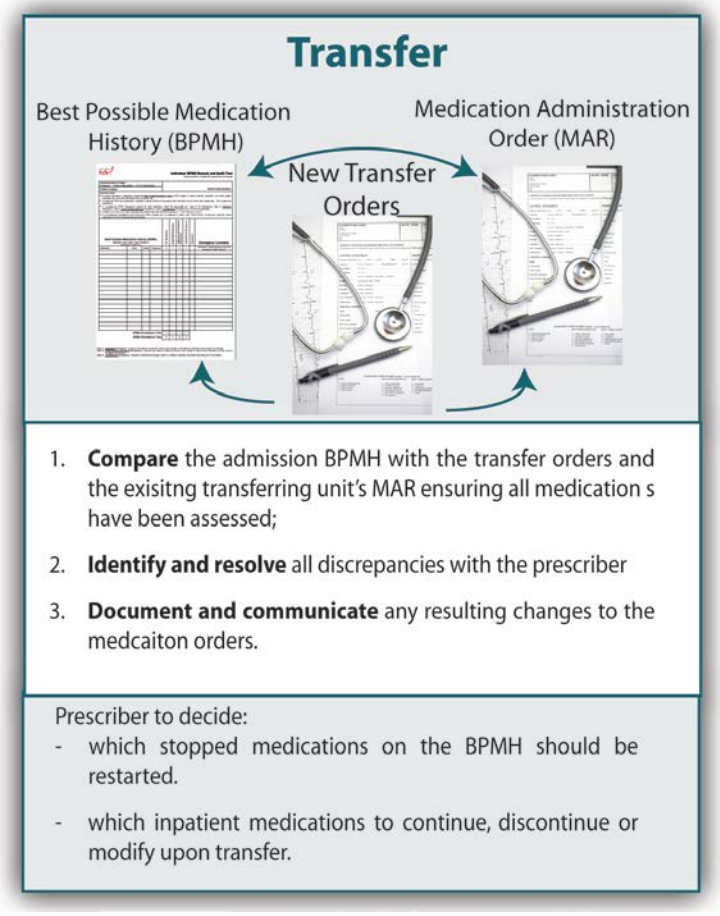
Organizations need to identify internal transfers that would benefit from MedRec. When orders are not rewritten and there are no changes in responsible medical service (e.g. transfer from one medical unit to another) MedRec may not be required.

The optimal procedure and personnel involved in medication reconciliation for internal hospital transfers will vary in different institutions. However, it is important to have a policy that designates who is responsible for completing the reconciliation and when it should occur.

The process may be paper-based or electronic and should require a sign-off to indicate that the process has occurred.

Internal transfer medication reconciliation involves assessing and accounting for:

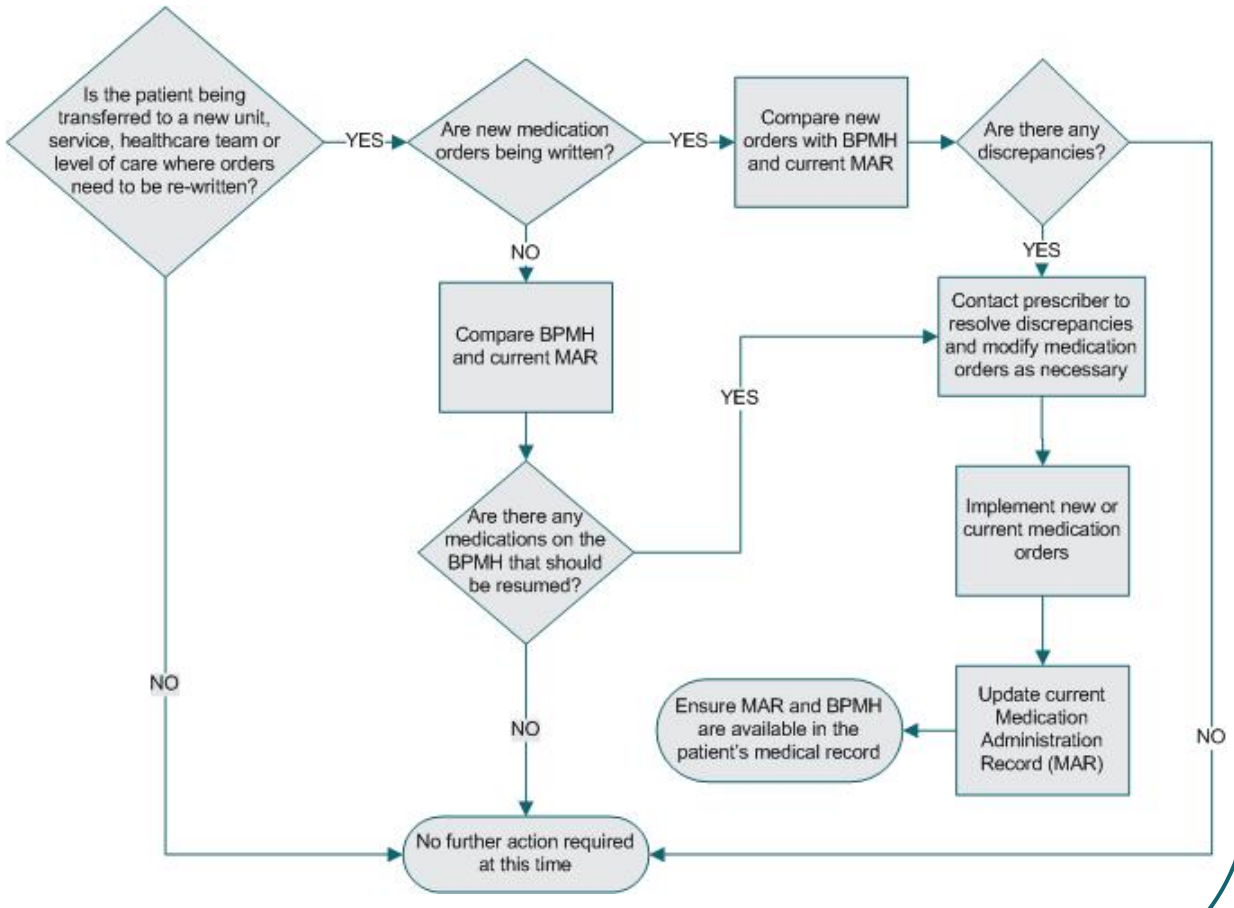
- medications the patient was taking prior to admission (BPMH);
- medications from the transferring unit (medication administration record (MAR)); and
- new post-transfer medication orders.



Medication Reconciliation at Internal Transfer

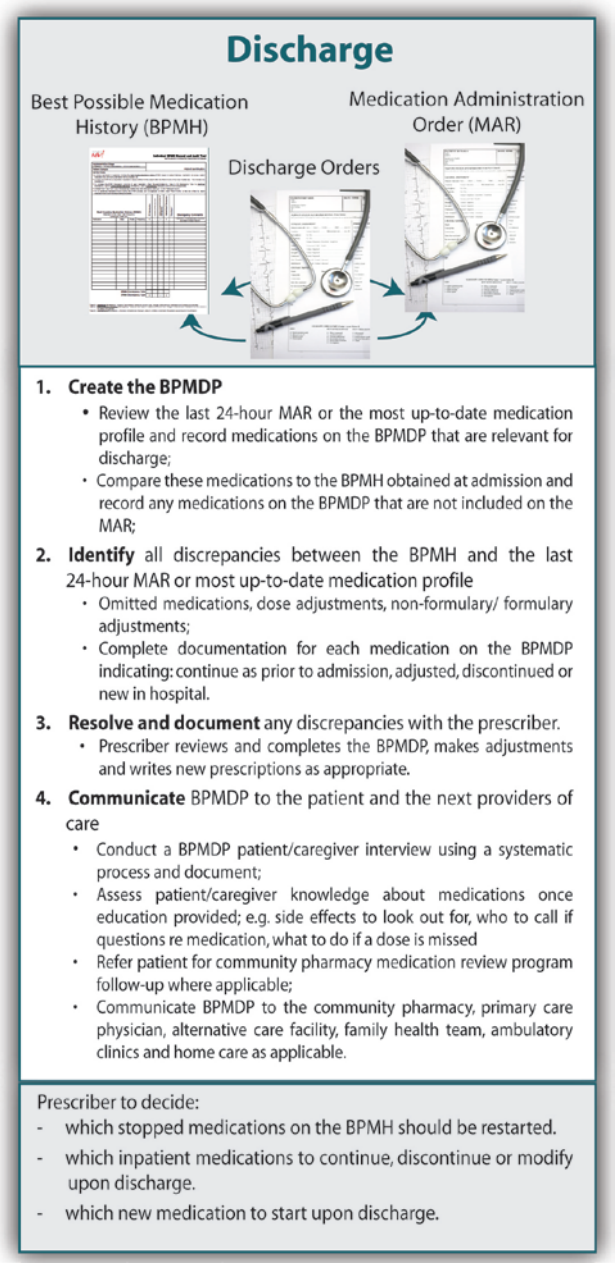
1. **Compare** the admission BPMH with the transfer orders and the existing transferring unit's MAR ensuring all medications have been assessed;
2. **Identify and resolve** all discrepancies with the prescriber;
3. **Document and communicate** any resulting changes to the medication orders.

Process of Medication Reconciliation at Transfer



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 (e.g. home/self-care, home or community care, acute care to long-term care.) Forster et al. highlighted the patient risk at this interface in a prospective study revealing that 23 per cent of patients discharged from a Canadian teaching hospital experienced an adverse event, of which 72 per cent were drug related.[8] 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 three sources of information:

- Medications the patient was taking prior to admission (BPMH)
- Most current MAR (medication administration record) or medication profile
- New medications planned to start upon discharge (discharge prescriptions)

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

- Medications the patient was taking prior to admission (BPMH). If a BPMH has not been completed on admission, it should be completed before discharge MedRec can be completed.
- Previous 24-hour MAR (medication administration record) or most up-to-date medication profile

- New medications planned to start upon discharge
- Using the Best Possible Medication History (BPMH) and the last 24-hour medication administration record (MAR) or most up-to-date medication profile as references, create the **Best Possible Medication Discharge Plan (BPMDP)** by evaluating and accounting for:
    - ❖ New medications started in hospital
    - ❖ Discontinued medications (from BPMH)
    - ❖ Adjusted medications (from BPMH)
    - ❖ Unchanged medications that are to be continued (from BPMH)
    - ❖ Medications held in hospital that need reassessment post-discharge
    - ❖ Non-formulary/formulary adjustments made in hospital
    - ❖ New medications started upon discharge
    - ❖ Additional comments as appropriate (e.g., status of herbals or medications to be taken at the patient's discretion)

The rationale for any changes to medications during the admission should be documented on the BPMDP and communicated to the patient and the next healthcare provider(s).

The **Best Possible Medication Discharge Plan (BPMDP)** may include:

- An up-to-date and accurate list of medications the patient should be taking on discharge.
- A medication information transfer letter to the next care provider which includes rationale for the medication changes.
- A structured discharge prescription to the next care provider or community pharmacist
- A patient information grid and/or wallet card.

The Best Possible Medication Discharge Plan (BPMDP) should be communicated as appropriate using a systematic process to the:

- Patient/caregiver
- Community physician
- Community pharmacy
- Long-term care provider
- Home Care provider
- Alternative care facility or service

If new information about the patient's home medications is discovered during the patients stay in hospital (e.g. during the discharge process), it is important that these discrepancies be resolved with the prescriber, discussed with the patient and documented. For example, if during discharge counselling it was found that a medication the patient was taking at home was inadvertently omitted on the BPMH and subsequently not ordered in hospital for the duration of their stay, this discrepancy should be resolved prior to discharge.

Medication Reconciliation at Discharge

1. **Create the BPMDP.**
   - Review the last 24-hour MAR prior to discharge and record medications on the BPMDP that are relevant for discharge;
   - Compare these medications to the BPMH obtained at admission and record any medications on the BPMDP that are not included on the MAR;
2. **Identify** all discrepancies between the BPMH and the last 24-hour MAR or medication profile.
   - Omitted medications, dose adjustments, non-formulary/formulary adjustments;
   - Complete documentation for each medication on the BPMDP indicating: continue as prior to admission, adjusted, discontinued or new in hospital.
3. **Resolve and document** any discrepancies with the prescriber.
   - Prescriber reviews and completes the BPMDP, makes adjustments and writes new prescriptions as appropriate.
4. **Communicate** BPMDP to the patient and the next providers of care (e.g. community/home care provider, primary care physician, community pharmacist as appropriate).
   - Conduct a BPMDP patient/caregiver interview using a systematic process and document;
   - Assess patient/caregiver knowledge about medications once education provided; e.g. side effects to look out for, who to call if questions re medication, what to do if a dose is missed
   - Refer patient for community pharmacy medication review program follow-up where applicable;
   - Communicate BPMDP to the community pharmacy, primary care physician, alternative care facility, family health team, ambulatory clinics and home care as applicable.

Note: *Unless specified, each institution and/or individual unit should determine who is primarily responsible for completing each step based on available resources (e.g., RPh, RN, MD)*

Developed by ISMP Canada with support from the Ontario Ministry of Health and Long-Term Care

A multidisciplinary, integrated medication reconciliation strategy including the hospital pharmacist where possible will reduce medication discrepancies at hospital discharge. This strategy should include tools such as a checklist, to support the clinician and patient with discharge reconciliation and should integrate and clarify medication information from all sources. For more information, please see Hospital to Home - Facilitating Medication Safety at Transitions A Toolkit and Checklist for Healthcare Providers.

Cross-Sectoral Collaboration

Many patients experience care in multiple settings with multiple providers over extended periods of time. Health care teams are recognizing the need to work together to design collaborative MedRec processes (e.g. involving acute care, primary care, long-term care) that enhance inter-team relationships and facilitate the communication of medication information as patients move through the healthcare system. For more information see National webinars and resources below:

- Redesigning the Transition Experience: Co-ordinating Patient Focused MedRec Across All Sectors
- Your Discharge is Someone's Admission

Enhancing Patient Engagement

Engaging with patients and families involves creating effective partnerships that support them to be actively involved in their own healthcare.[30] It is important to partner with them so that they have the information and tools needed to manage their medications safely.

Patients and families play an important role in maintaining an up-to-date list of their medications and sharing this information at transitions in care. Before they leave the hospital, they should receive information about their medication and any changes that have been made, and have an opportunity to ask questions. Patients should be provided with an up-to-date medication list that is arranged in a way they can easily understand. They should be encouraged to share this list and request that it is reviewed with them during encounters with healthcare providers.

For a tool to support patients and healthcare providers to have a discussion about their medications, see "5 Questions to Ask About Your Medications".

For information and tools to assist patients to keep an up-to-date medication list, see "Keep a List of Your Medicines"

Measuring the MedRec Process

Acute care organizations are encouraged to assess how they are performing the basic steps of the MedRec process. Routine measurement will enable you to evaluate the quality of and compliance with your established MedRec process, identify opportunities for improvement, and monitor your performance over time. We recommend that you measure your MedRec processes on a monthly or quarterly basis to help you on your journey to improve the delivery of safe and effective care for patients.

Note: Accreditation Canada's MedRec Required Organizational Practices includes a test for compliance in which organizations are required to monitor compliance with their medication reconciliation process, and make necessary improvements.

Recommended Measures

Measuring MedRec performance and improvement involves measuring both the quality of and compliance with established MedRec processes.

To measure the **quality** of MedRec processes consider each of the following components:

At admission

- The BPMH was created using greater than one source of information (e.g., patient interview and at least one additional source).
- Actual medication use was verified by interviewing the patient or caregiver source.
- Each medication has drug name, strength (if applicable), dose, route, and frequency on BPMH and admission orders.
- Each medication in the BPMH is accounted for in the admission orders.
- The prescriber has documented rationale for added, changed and/or discontinued medications (e.g. on BPMH/MedRec form, in admission note).
- Discrepancies (differences between BPMH and admission orders) have been documented, communicated, and resolved.

At internal transfer

- All medications on the admission BPMH are accounted for (e.g. on MedRec form, in the transfer note).
- Each medication has drug name, strength (if applicable), dose, route, and frequency on the transfer orders.
- The prescriber has documented rationale for added, changed and/or discontinued medications (e.g. on MedRec form, in the transfer note).
- There are no outstanding discrepancies between the BPMH, the most recent 24 hour MAR and the transfer orders.

At discharge

- All medications on the admission BPMH are accounted for on the best possible medication/discharge plan (BPMDP) e.g. new medications started in hospital, adjusted and/or discontinued medications (from BPMH), adjusted medications (from BPMH), unchanged medications that are to be continued, medications held in hospital that need reassessment post-discharge, and non-formulary/formulary adjustments made in hospital.
- There are no outstanding discrepancies between the most recent 24 hour MAR and the BPMDP and/or discharge medication documentation.
- Each medication on the BPMDP and/or discharge medication documentation has drug name, strength (if applicable), dose, route, and frequency.
- The prescriber has documented the rationale for added, changed and/or discontinued medications on the BPMDP and/or discharge medication documentation.
- The BPMDP and/or discharge medication documentation has been provided to and reviewed with the patient/caregiver.
- The BPMDP and/or discharge medication documentation has been communicated to the next healthcare provider(s).

To measure **compliance** with MedRec processes, evaluate the following:

Percentage of patients reconciled at admission

The percentage of patients reconciled at admission is a process measure to determine the degree to which medication reconciliation is performed and evaluates if the system is performing as planned. This measure is aligned with the Accreditation Canada performance measure.

$$\text{Percent of Patients Reconciled at Admission} = \frac{\text{Number of patients reconciled}}{\text{Number of patients admitted}} \times 100$$

Goal: 75% of eligible patients reconciled at admission

Percentage of patients reconciled at internal transfer

The percentage of patients reconciled at internal transfer is a process measure to determine the degree to which medication reconciliation is performed and evaluates if the system is performing as planned.

$$\text{Percent of Patients Reconciled at Internal Transfer} = \frac{\text{Number of patients reconciled}}{\text{Number of patients transferred}} \times 100$$

Goal: 75% of eligible patients reconciled at internal transfer

Percentage of patients reconciled at discharge

The percentage of patients reconciled at discharge is a process measure to determine the degree to which medication reconciliation is performed, a patient receives a Best Possible Medication Discharge Plan and evaluates if the system is performing as planned.

$$\text{Percent of Patients receiving a BPMDP at Discharge} = \frac{\text{Number of patients in the sample for whom a BPMDP was created}}{\text{Number of patients in the sample}} \times 100$$

BPMDP = Best Possible Medication Discharge Plan

Goal: increase (as close to 100% of eligible patients as possible)

Additional Measures

The following measures may be useful to teams in building a business case for MedRec and/or assessing the effectiveness of medication reconciliation and other impacts on the system as it is implemented.

- Percentage of patients with at least one unintentional discrepancy
- Unplanned readmissions within 30 days of discharge from hospital
- Time it takes to conduct a BPMH
- Time from admission to reconciliation
- Patient and staff satisfaction with the MedRec process

Don't give up!! If measures do not reflect improvement, your team should investigate why (e.g. non-compliance to MedRec processes, and/or gaps in quality of MedRec processes) and make any necessary improvements. For more information see Appendix C – The Model for Improvement

See **Appendix B** 'Measurement Resources' for more information.

Summary

Medication reconciliation will take time and resources to implement across an organization. A national focus on sharing experiences and success stories will facilitate implementation of medication reconciliation in Canada across the continuum of care with the goal of reducing potential adverse drug events, improving the healthcare of patients and saving lives from preventable medication errors.

Medication reconciliation is intended to decrease medication errors however, unless we hear about them, we will not understand the contributing factors and be able to identify opportunities for system-wide improvement.

If a medication reconciliation incident occurs in your organization, report it to ISMP Canada, a key partner in the Canadian Medication Incident Reporting and Prevention System (CMIRPS):
http://www.ismp-canada.org/err_index.htm

SafeMedicationUse.ca

Encourage your patients to report medication reconciliation incidents to Safe Medication Use at:
http://www.safemedicationuse.ca/report/

MEDICATION RECONCILIATION IN ACUTE CARE

Implementing MedRec

Appendix A

Appendix A: Implementing Medication Reconciliation

The following outlines the key steps for getting started on implementation of Medication Reconciliation.

1. **Secure Senior Leadership Commitment**
2. **Form a Team**
3. **Define the Problem**
    - Set Aims (Goals and Objectives)
4. **Start with Small Projects and Build Expertise in Reconciling Medications**
    - Map the current process
5. **Evaluate Improvements Being Made – Collect Data**
6. **Spread**

Note: It is recommended to use the Model for Improvement when implementing medication reconciliation in your organization. See **Appendix C**: The Model for Improvement

1. Secure Senior Leadership Commitment

Implementing a successful medication reconciliation process requires clear commitment and direction from the highest level of the organization. Visible senior leadership support can help to 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 and demonstrating the need for ADE prevention and reductions in work and rework. Present progress to senior leadership regularly: present stories of errors prevented by the medication reconciliation process; identify resources needed to be successful.

2. Form a Team

A team approach is needed to ensure medication reconciliation is completed successfully. 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.

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.

Representation of 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

On a patient care unit level, a small '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 practitioner, nurse manager, frontline nurse, pharmacist and patient. Team members can communicate in a variety of methods including short stand-up meetings on the unit.

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.

3. Define the Problem

Set Aims (Goals & Objectives)

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 in the patient care process, the aims should be specific to what it is they are hoping to achieve at that point. For example:

> Improve the percentage of patients reconciled at admission on unit X by 75 per cent within the next three months.

4. Start with Small Tests of Change & Build Expertise in Reconciling Medications

- Initially implement a medication reconciliation process on a smaller scale with select groups of patients, on select units or during a specific point in the continuum of care 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.

Embed the medication reconciliation process into normal processes of care and work towards reconciliation forms that result in orders.

- Although medication reconciliation can occur at any of the transition points in care (e.g., admission, transfer, discharge), we suggest that you **start at the admission process**. If medication reconciliation is not done right at admission, you could be continuing your process using inaccurate information. As patients may be admitted to the hospital from a number of points, select one area (e.g. pre-operative screening or the emergency department).
- **Map the current process**. Use a simple process flow diagram to outline the current process in place. Note: keep this process simple, but make sure to include all those involved in the process as its purpose is to identify the sequence of events and who is doing what.
- **Map the ideal process**. Involve all team members to develop a new ideal process that can be trialed and tested using a model for improvement.
- **Adapt and test a medication reconciliation form**. The purpose of a medication reconciliation form is to aid in the collection of a best possible medication history (BPMH), to share the information with prescribers, and to facilitate reconciliation (the documentation of prescriber decisions about medication orders). Many institutions adapt a prescriber's order form for this purpose. As with any changes you make, our recommendation is to test the form first on a small scale and modify as needed.

Your Medication Reconciliation Form is used to document/facilitate the process of medication reconciliation and is specific to your organization.

5. Evaluate the Improvements Being Made – Collect Data

See **Appendix B** Measurement Resources.

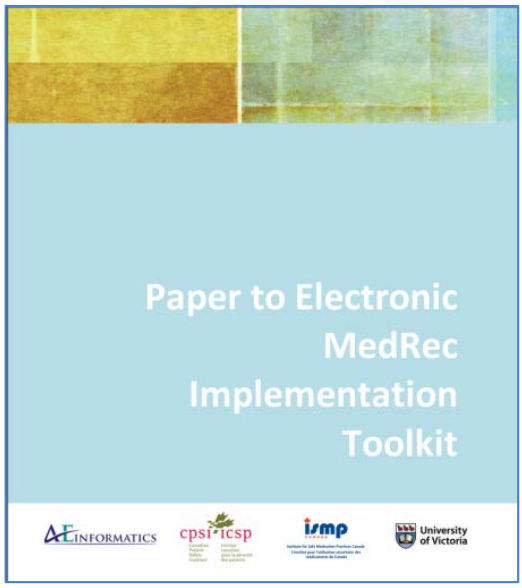
6. Spread

As experience develops and measurement of the success of your medication reconciliation process reflects sustained improvement the process can 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 healthcare 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. 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.

The key to engaging front-line staff is to describe how each step in the process benefits patients.

Implementation of Electronic MedRec – Paper to Electronic MedRec Toolkit



This toolkit explores current electronic MedRec (eMedRec) practices in Canada and provides guidance for organizations to migrate from a paper-based system to an electronic system for MedRec.

Paper to Electronic MedRec Implementation Toolkit:

- English
- French

MEDICATION RECONCILIATION IN ACUTE CARE

Measurement Resources

Appendix B

Appendix B: Measurement Resources

Measuring Performance and Improvement

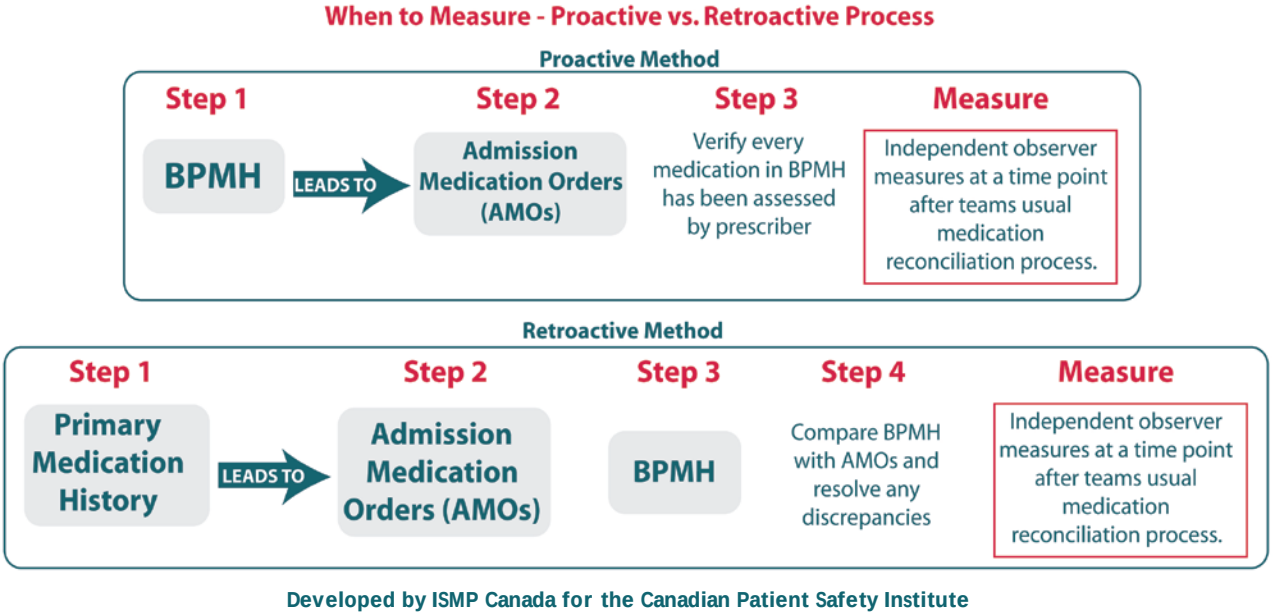
Who should measure?

Measurement should be conducted by an *independent observer* who is familiar with the process and how to obtain the BPMH. The purpose is to ensure all medication discrepancies have been identified and resolved or in the process of being resolved.

The role of the independent observer is to compare the BPMH to existing orders and any readily available sources of medication information, to ensure all discrepancies have been identified and resolved, or is in the process of being resolved. The independent observer may be a nurse, pharmacist, pharmacy technician, nurse practitioner, physician or quality improvement staff member who is not responsible for routine operations in the clinical area under review.

When should measurement occur?

It is important to emphasize that measurement should occur as soon as possible **after** the usual medication reconciliation process has occurred. The concurrent method of data collection should be used. Concurrent audits identify patients "at risk" while they are "at hazard" and immediate actions for improvement can be made. They also make it easier to distinguish intentional from unintentional discrepancies than does a retrospective chart audit. The following example illustrates when to measure your process on admission.



How long should you continue to measure?

Quality of MedRec should be measured monthly until data shows that the team's implemented process reflects the components of the MedRec process. This should continue until teams have **achieved and sustained a target improvement goal**. Thereafter, to monitor whether improvements are being sustained, it is important to audit on a regular basis.

Compliance with the MedRec processes should be measured on an ongoing basis as they reflect the number of patients being appropriately reconciled. The 'Percentage Reconciled' measure supports the Accreditation Canada tests for compliance in which organizations are required to monitor compliance with their medication reconciliation process and make necessary improvements.

Sampling Strategies

Teams in each service area should collect data for a sample of 20 charts per month. If the number of admissions, internal transfers or discharges in the service area is less than 20, teams should collect data for all admissions, internal transfers or discharges. Larger service areas may choose to review more charts each month depending on patient volumes. Charts reviewed should be taken from a random sample. Two strategies that could be used for selecting a random sample are described below.

Methods to Generate a Random Sample:

Method 1 - Nth Client Method: Based on the total number of admissions, internal transfers or discharges, estimate the average number of clients for a month. Based on this number, calculate the 'nth' number of clients to sample to ensure a random sample of at least 20 clients is achieved. For example, service area A has an average of 200 clients admitted per month. The independent observer will select every 10th client to achieve a sample of at least 20.

Method 2 - X Days in a Month Method: Based on admissions, internal transfers or discharges, estimate the average number of clients for a month. Based on this number, calculate the average number of clients per day, followed by the number of days required for the independent observer to ensure a random sample of at least 20 clients. For example service area B has an average of 240 clients per month resulting in an average of 8 clients per day (240/30=8). With this method two to three days (Goal=20 and 8pts x 2days =16pts – 8pts x 3days =24 pts) could be randomly selected (random number generator) out of the month to conduct measurements.

Notes for Method 2:

This method is less preferable due to several types of potential bias, such as the potential for differences in performance on selected days (i.e. three Mondays vs. three Thursdays). For the X days per month method, once the number of days to be sampled per month is determined, these days need to be randomly sampled within the month.

Additional Notes for Selecting a Random Sample:
Once an organization has selected one of the sampling strategies, this approach must be used consistently throughout the data collection period. To reduce potential bias, the independent observer should be the only one to know which sampling strategy is selected, and which cases will be reviewed.

Data collection tool examples

Admission MedRec Audit Tool

Instructions for the Admission MedRec Quality audit tool

Discharge MedRec Audit Tool

Instructions for the Discharge MedRec Quality Audit Tool

Measurement Tips

Adapted from the Institute for Healthcare Improvement, *Tips for Effective Measures*; accessed August 9, 2006.

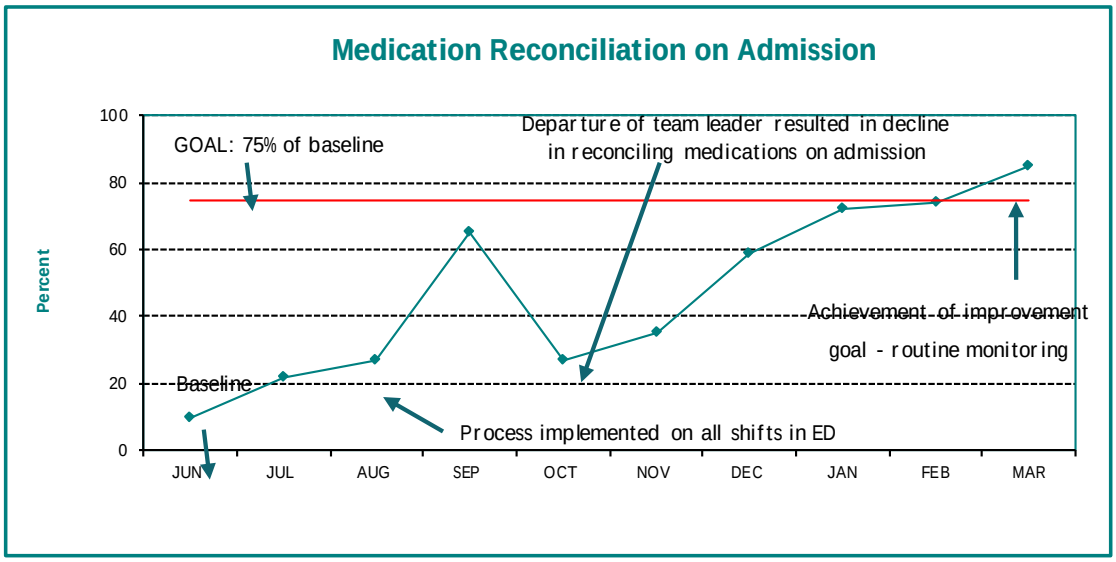
1. **Plot data over time.** Much information about a system and how to improve it can be obtained by plotting data over time and then observing trends and other patterns. Tracking a few key measures over time is the single most powerful tool a team can use and will help them to see the effects of the changes they are making. Within your organization we encourage you to use run charts – described below, to show progress over time.

   Run Charts - Track Your Measures over Time

   Determining if improvement has really happened and if it is lasting, requires observation of patterns over time. Run charts are graphs that display data over time and are one of the single most important tools in performance improvement. Using run charts has a variety of benefits:

   - They 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
   - They give direction as you work on improvement and information about the value of particular changes

Run chart example



2. **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.

   - **Integrate measurement into the daily routine.** Useful data are 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.
   - **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, 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.

The goal of measurement is improvement, not the development of a measurement system:

- Measurement should speed up improvement
- Key measures should clarify objectives
- Integrate measurement into daily routines
- Link measures for improvement with other initiatives in the unit/organization
- Involve stakeholders in the measurement process

MEDICATION RECONCILIATION IN ACUTE CARE

Model for Improvement

Appendix C

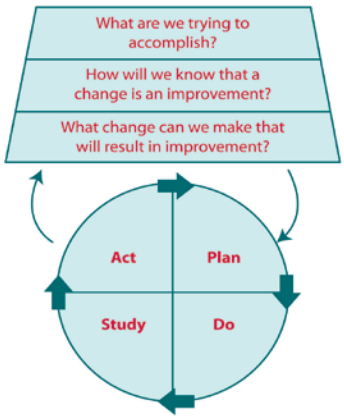
Appendix C: The Model for Improvement

Developed by Associates in Process Improvement, the Model for Improvement is "a simple yet powerful tool for accelerating improvement"[31] that "has been successfully used by hundreds of health care organizations to improve many different health care processes and outcomes".

The model has two parts:

1. Three fundamental questions that guide improvement teams to: 1) set clear aims, 2) establish measures that will tell if changes are leading to improvement, and 3) identify changes that are likely to lead to improvement.
2. The Plan-Do-Study-Act (PDSA) cycle to conduct small-scale tests of change in real work settings — by planning a change, trying it, observing the results, and acting on what is learned. This is the scientific method used for action-oriented learning.

THE MODEL FOR IMPROVEMENT



Langley G;Nolan KM, Nolan TW, Norman CL, Provost LP. The Improvement Guide: A Practical Approach to Enhancing Organizational Performance.

Set Aims

Improvement requires setting aims. The aim should be time-specific and measurable; it should also define the specific population of residents that will be affected.

Establish Measures

Teams use quantitative measures to determine if a specific change actually leads to an improvement.

Select Changes

All improvement requires making changes, but not all changes result in improvement. Organizations therefore must identify the changes that are most likely to result in improvement.

Test Changes

The Plan-Do-Study-Act (PDSA) cycle is shorthand for testing a change in the real work setting — by planning it, trying it, observing the results, and acting on what is learned. This is the scientific method used for action-oriented learning.

Implementation: After testing a change on a small scale, learning from each test, and refining the change through several PDSA cycles, the team may implement the change on a broader scale — for example, test medication reconciliation on admissions first.[31]

- Keep testing and fine tuning using the PDSA process. Request input and incorporate recommended changes.
- Medication reconciliation often involves the development of a documentation form. Ask an appropriate healthcare professional to test the medication reconciliation form to determine ease of use, ability to capture needed information, and formatting issues. Use the results of this test to modify the form. The form should fit your system and even if it is an extra form temporarily it must be built in to the system over time.
- The list of medications may never be perfect. According to Roger Resar, MD, Senior Fellow at Institute for Healthcare Improvement and a pioneer in developing this process, the phrase "as complete as possible" is key.
- Once the form has been modified, ask another healthcare professional to test it on a small number of patients.
- Test processes associated with the use of the form (e.g. compliance with the completion, when completed, etc.)
- Continue testing and changing the form until you have reached a point where it is easy to use, collects the information required, and allows for communication as patients move through different levels of care. You need to consider when the form is 'good enough' and avoid prolongation of finalizing forms.
- Provide site specific patient case examples of Medication Reconciliation cases to illustrate the problems with the current process.

Learn more about the Model for Improvement from the Institute for Healthcare Improvement.

MEDICATION RECONCILIATION IN ACUTE CARE

Sample Tools and Resources

Appendix D

Appendix D: Sample Tools and Resources

Triaging Patients for MedRec in the Emergency Department

Adapted and *used with permission* from Washington State community hospital emergency departments

Step 1. Involve patients earlier in medication information gathering.

- Educate the patients before they come into the ER so that they will anticipate the need to present an up-to-date medication list, medication vials or a dispensing record from their community pharmacy (e.g. community newsletters, media, social media, family doctors' offices, ambulance services).
- If patients do not have the medication information with them, give patients a form to fill out in the ER to list their medications and resources to contact their pharmacy or family physician for information.

Step 2. The triage nurse in ER reviews the patient's sources of information (use at least one other reliable sources) and categorizes the patient into one of three categories.

- **Category 1: no medications**. This group requires no further work other than to document the fact that the patient is not taking medications.
- **Category 2: medications known.** These patients have at least one other reliable source of medication information and they know the names of the medications they take. They have their medication vials/list with them. They are ready to have their BPMH taken by the team once the decision has been made to admit or the triage nurse or their delegate may obtain the BPMH.
- **Category 3: medications unknown.** This is the small percentage of patients taking medications who do **not** know the name of at least one of their medications, are unable to give information due to their medical status, or do not have caregivers available who can provide this information. These patients are the only ones for whom additional information gathering efforts by the ER team is necessary if this patient is to be admitted. Their charts are flagged.

Step 3. For Category 3 patients who are admitted, delegate the gathering of missing information to clerical/administrative staff.

They may:

- access the electronic provincial medication record (as available).
- contact the patient's community pharmacies for a fax of the medication list

- ask family members to bring in medications
- call family physicians to send in patient's medication lists

Once the information is complete, the flag is removed, patient becomes a Category 2 and is ready to have their BPMH taken, once admitted.

Step 4. Flag patients with missing medication information.

The purpose of flagging patients with incomplete medication lists is to make it obvious to doctors and nurses in the emergency department that a patient has missing medication information. Possible flags include colored buttons on a hospital gown, a brightly colored bracelet or a 'dog-tag' style necklace.

Admission MedRec Form

Alberta Health Services

Best Possible Medication History (BPMH) and Reconciled Admission Medication Orders

*See reverse for instructions on use

Affix patient label within this box

Medication Allergies ☐ Yes ☐ No } **Must be entered in Meditech**
Weight
Height

Sources: Minimum of 2 sources required (✓) all that are used
☐ Patient/Caregiver ☐ Bottle/Bubble Pack
O unable to provide med history ☐ Community Pharmacy list
☐ Patient med list *(current)* ☐ MAR from another facility
☐ Other _____ ☐ Netcare

Community Pharmacy	**Community Pharmacy**

☐ No Home Medications ☐ Prenatal Vitamin Only **Medication**	Dose	Route	Frequency	Last Dose Date/Time	**Prescriber Orders (✓)** Continue	Stop	Hold	Changed on Physician Order	**Reason for Changes to Home Medication**

Comments

Initial History Obtained by	Date/Time	Additional Information Obtained by	Date/Time	☐ Copy of BPMH sent to receiving facility/unit on patient TRANSFER
Prescriber Signature	Date/Time	Additional Information Obtained by	Date/Time	

19268(Rev2015-03) **Do Not Thin From Chart** Page _____ of _____

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Discharge Medication List

yukon
hospital corporation

Whitehorse General Hospital
5 Hospital Road, Whitehorse, YT, Y1A 3H7
Phone: (867) 393-8700

BEAR
GRIZZLY
DOB: M/70
HC#: 002916734 INS: YHIS
FAM: DR DOCTOR
Att: DR DOCTOR

M000001405
Admit: 22/03/16
AC000007/16
MED
ADM: DOCTOR

Medication Schedule

Allergies: PENICILLIN (HIVES)

Name of Pharmacy: Medicine Chest Ogilvie st

Medication	Dose	Route	Frequency	Indications/Comments/ Reason for Change	Breakfast	Lunch	Supper	Bedtime
LEVOTHYROXINE TABLET (SYNTRHOID)	0.125 MG	ORAL	DAILY		X			
metFORMIN TABLET (GLUCOPHAGE)	500 MG	ORAL	THREE TIMES DAILY WITH FOOD		X	X	X	
METOPROLOL TABLET (LOPRESSOR)	25 MG	ORAL	TWICE DAILY	REPLACING BISOPROLOL. TO CONTROL HEART RATE (ATRIAL FIBRILLATION)	X			X
RAMIPRIL CAPSULE (ALTACE)	5 MG	ORAL	DAILY	DOSE DECREASED DUE TO LOW BLOOD PRESSURE	X			
WARFARIN TABLET (COUMADIN)	5 MG	ORAL	AT SUPPER	FOR PREVENTION OF STROKE (ATRIAL FIBRILLATION)			X	

Comments

Prepared by: Josianne Gauthier, Clinical Pharmacist

Date: 22/03/16

Page 1 of 1

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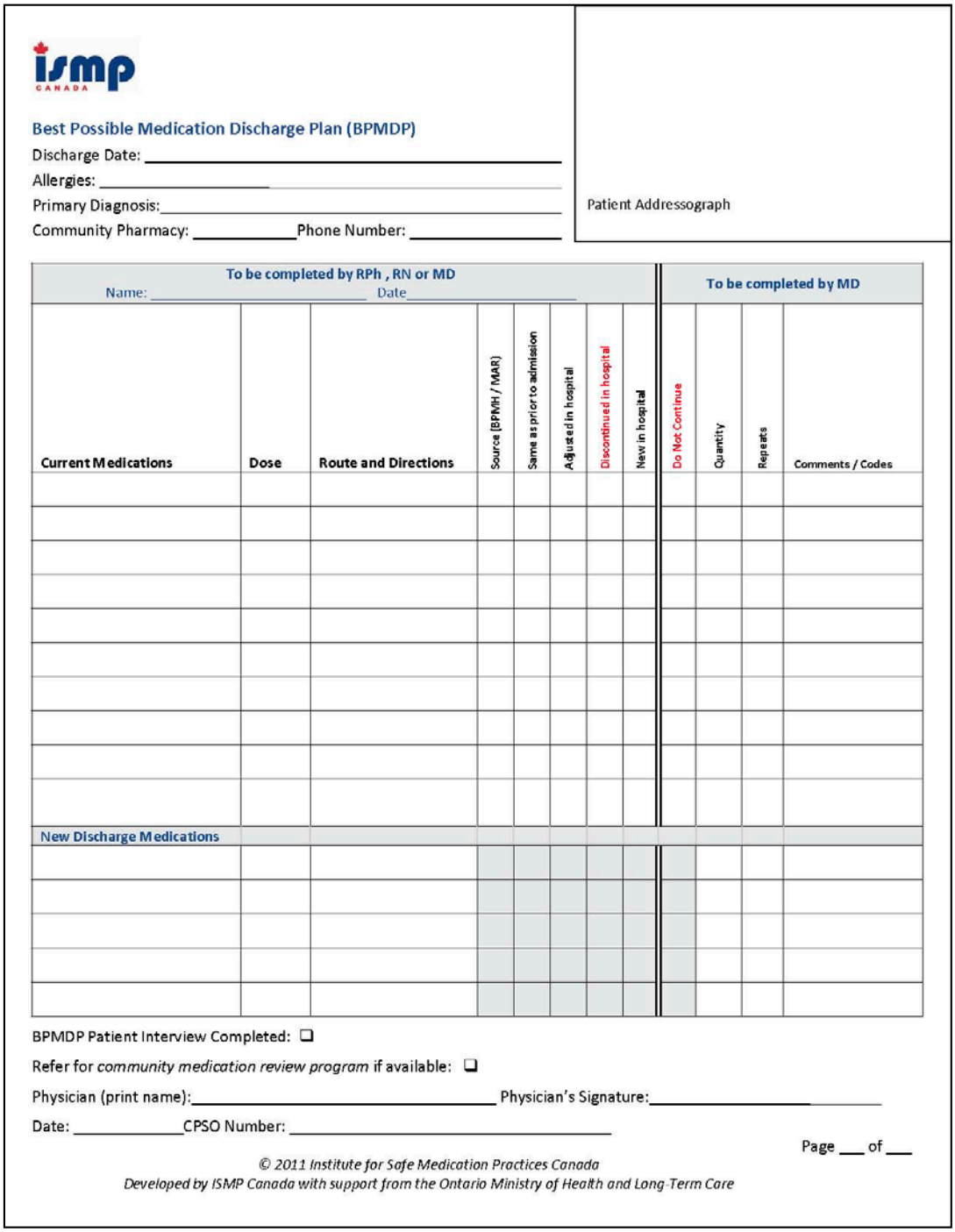
Best Possible Medication Discharge Plan

ISMP Canada has developed forms that may be used as tools for discharge medication reconciliation from an acute care facility.

The Best Possible Medication Discharge Plan (BPMDP) form is available on the ISMP Canada website and can be adapted for use within your organization with permission in writing from ISMP Canada.



ISMP CANADA

Best Possible Medication Discharge Plan (BPMDP)

Discharge Date: _____

Allergies: _____

Primary Diagnosis: _____

Community Pharmacy: _____ Phone Number: _____

Patient Addressograph

To be completed by RPh , RN or MD Name: _____ Date _____								To be completed by MD			
Current Medications	**Dose**	**Route and Directions**	**Source (BPMH / MAR)**	**Same as prior to admission**	**Adjusted in hospital**	**Discontinued in hospital**	**New in hospital**	**Do Not Continue**	**Quantity**	**Repeats**	**Comments / Codes**
New Discharge Medications											

BPMDP Patient Interview Completed: ❑

Refer for *community medication review program* if available: ❑

Physician (print name): _____ Physician's Signature: _____

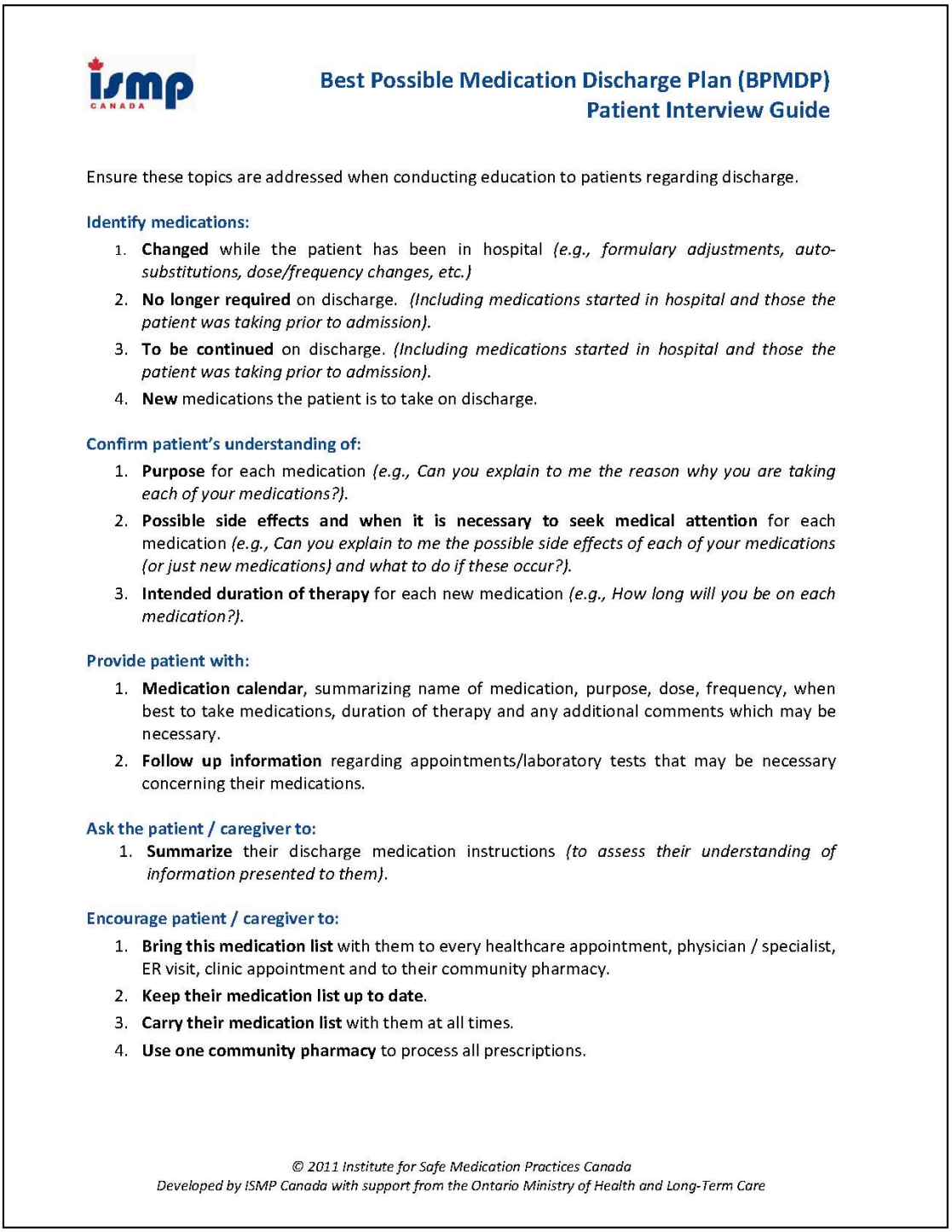
Date: _____ CPSO Number: _____

Page ___ of ___

Developed by ISMP Canada with support from the Ontario Ministry of Health and Long-Term Care

Best Possible Medication Discharge Plan (BPMDP) Patient Interview Guide

The *Best Possible Medication Discharge Plan (BPMDP) Patient Interview Guide* is available on the ISMP Canada website and can be adapted for use within your organization with permission in writing from ISMP Canada.



ismp CANADA

Best Possible Medication Discharge Plan (BPMDP)
Patient Interview Guide

Ensure these topics are addressed when conducting education to patients regarding discharge.

Identify medications:

1. **Changed** while the patient has been in hospital *(e.g., formulary adjustments, auto-substitutions, dose/frequency changes, etc.)*
2. **No longer required** on discharge. *(Including medications started in hospital and those the patient was taking prior to admission).*
3. **To be continued** on discharge. *(Including medications started in hospital and those the patient was taking prior to admission).*
4. **New** medications the patient is to take on discharge.

Confirm patient's understanding of:

1. **Purpose** for each medication *(e.g., Can you explain to me the reason why you are taking each of your medications?).*
2. **Possible side effects and when it is necessary to seek medical attention** for each medication *(e.g., Can you explain to me the possible side effects of each of your medications (or just new medications) and what to do if these occur?).*
3. **Intended duration of therapy** for each new medication *(e.g., How long will you be on each medication?).*

Provide patient with:

1. **Medication calendar**, summarizing name of medication, purpose, dose, frequency, when best to take medications, duration of therapy and any additional comments which may be necessary.
2. **Follow up information** regarding appointments/laboratory tests that may be necessary concerning their medications.

Ask the patient / caregiver to:

1. **Summarize** their discharge medication instructions *(to assess their understanding of information presented to them).*

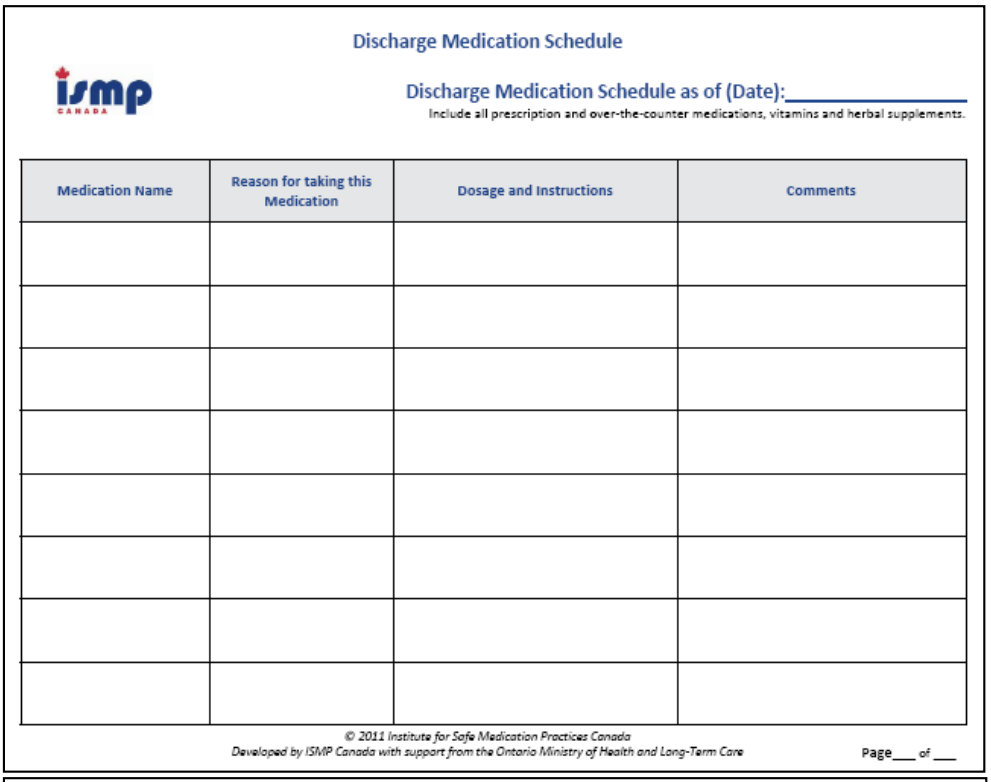
Encourage patient / caregiver to:

1. **Bring this medication list** with them to every healthcare appointment, physician / specialist, ER visit, clinic appointment and to their community pharmacy.
2. **Keep their medication list up to date**.
3. **Carry their medication list** with them at all times.
4. **Use one community pharmacy** to process all prescriptions.

Developed by ISMP Canada with support from the Ontario Ministry of Health and Long-Term Care

Discharge Medication Schedule

The *Discharge Medication Schedule* is available on the ISMP Canada website and can be adapted for use within your organization with permission in writing from ISMP Canada.



Discharge Medication Schedule

Discharge Medication Schedule as of (Date):_____

Include all prescription and over-the-counter medications, vitamins and herbal supplements.

Medication Name	Reason for taking this Medication	Dosage and Instructions	Comments

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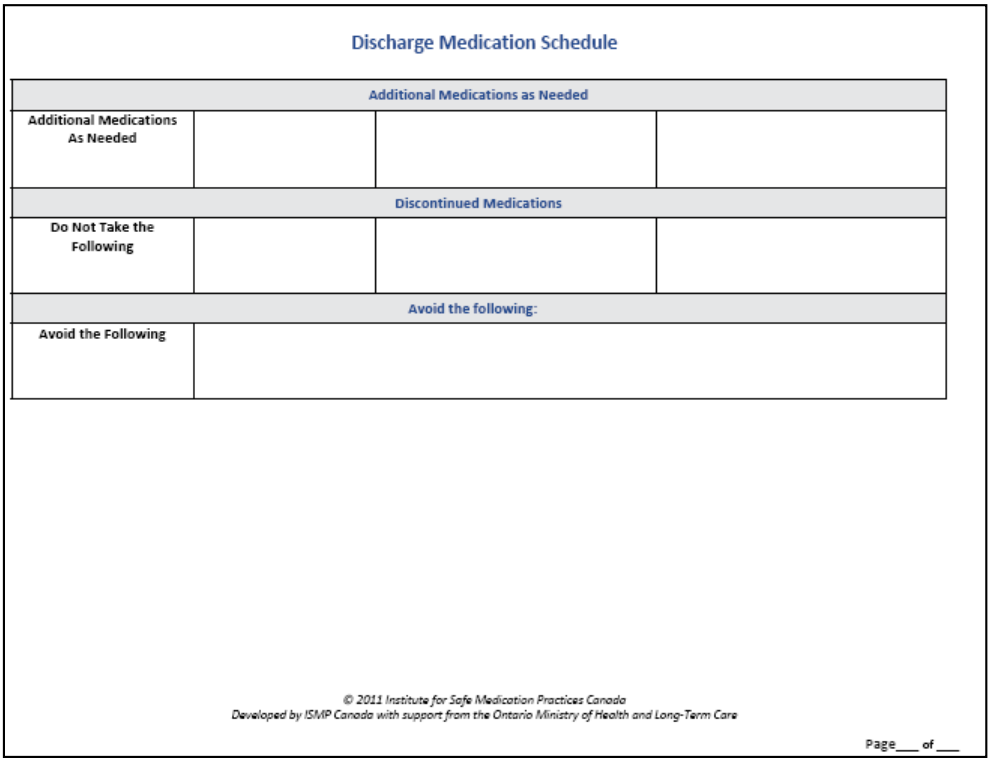
Page___ of ___



Discharge Medication Schedule

Additional Medications as Needed			
Additional Medications As Needed			
Discontinued Medications			
Do Not Take the Following			
Avoid the following:			
Avoid the Following			

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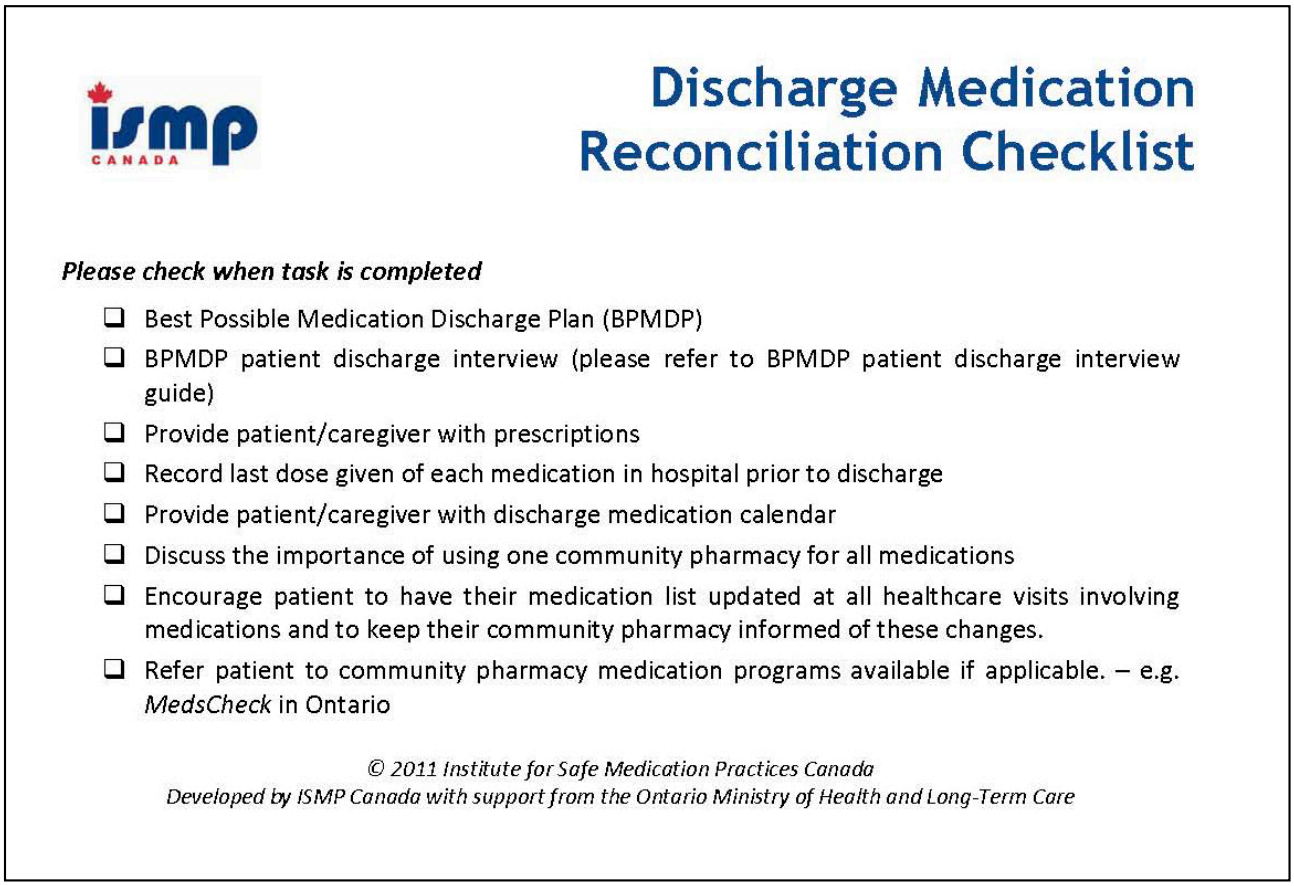
Page___ of ___

Discharge Medication Reconciliation Checklist

The Discharge Medication Reconciliation Checklist is available on the ISMP Canada website and can be adapted for use within your organization with permission in writing from ISMP Canada.



ismp CANADA

Discharge Medication Reconciliation Checklist

Please check when task is completed

- ❑ Best Possible Medication Discharge Plan (BPMDP)
- ❑ BPMDP patient discharge interview (please refer to BPMDP patient discharge interview guide)
- ❑ Provide patient/caregiver with prescriptions
- ❑ Record last dose given of each medication in hospital prior to discharge
- ❑ Provide patient/caregiver with discharge medication calendar
- ❑ Discuss the importance of using one community pharmacy for all medications
- ❑ Encourage patient to have their medication list updated at all healthcare visits involving medications and to keep their community pharmacy informed of these changes.
- ❑ Refer patient to community pharmacy medication programs available if applicable. – e.g. *MedsCheck* in Ontario

Developed by ISMP Canada with support from the Ontario Ministry of Health and Long-Term Care

Example of an electronic-based system

HOSPITAL NAME AND LOGO

Date: xxx
Patient Name: xxx
Patient Address: xxx
Patient Phone #: xxx

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: xxx
CPSO Number: xxx
Physician Phone #: xxx
Physician Signature: xxx
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:
- Aspirin 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 with meals
- 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 XXXX drug

An inpatient pharmacist helped to prepare this prescription.

As an example of an **electronic-based system**, the University Health Network (UHN) in Toronto has developed software to produce the following to be used to generate the BPMDP at discharge from hospital. The following forms have been used with permission.

Used with permission

Patient wallet card

A Portable list of medications for the patient and for communication to health care professionals

Drug and dose	Directions
Calcium Carbonate 500 mg tablet	Take 1 tablet three times daily
Ibuprofen 200 mg tablet (ADVIL)	Take 1 tablet as needed
Metoprolol 50 mg tablet	Take 2 tablets two times daily
Atorvastatin 20mg tablet (LIPITOR)	Take 1 tablet at bedtime

Used with permission

Discharge Prescription Schedule for Patient and Family

Communicates the entire adjusted medication regimen intended for the patient post discharge.

Discharge Prescription Schedule for Patient & Family

Name: xxx **Date: xxx**

Documented Allergies: • Penicillin • Codeine

My family physician is _____ phone _____

Morning

Medication	Comments	Directions
Calcium Carbonate 500mg tablet	Phosphate binder Take with food	Take 1 tablet
Metoprolol 50mg tablet	For blood pressure	Take 2 tablets

Noon

Medication	Comments	Directions
Calcium Carbonate 500mg tablet	Phosphate binder Take with food	Take 1 tablet

Supper

Medication	Comments	Directions
Calcium Carbonate 500mg tablet	Phosphate binder Take with food	Take 1 tablet
Metoprolol 50mg tablet	For blood pressure	Take 2 tablets

Bedtime

Medication	Comments	Directions
Atorvastatin 20mg tablet (LIPITOR)	Take at night (bedtime)	Take 1 Tablet

As needed

Medication	Comments	Directions
Ibuprofen 200mg tablet (ADVIL)	Take as needed for pain only	Take 1 tablet as needed

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

Prepared by _____, Pharmacist, _____ Hospital
Phone:_____ Pager:_____

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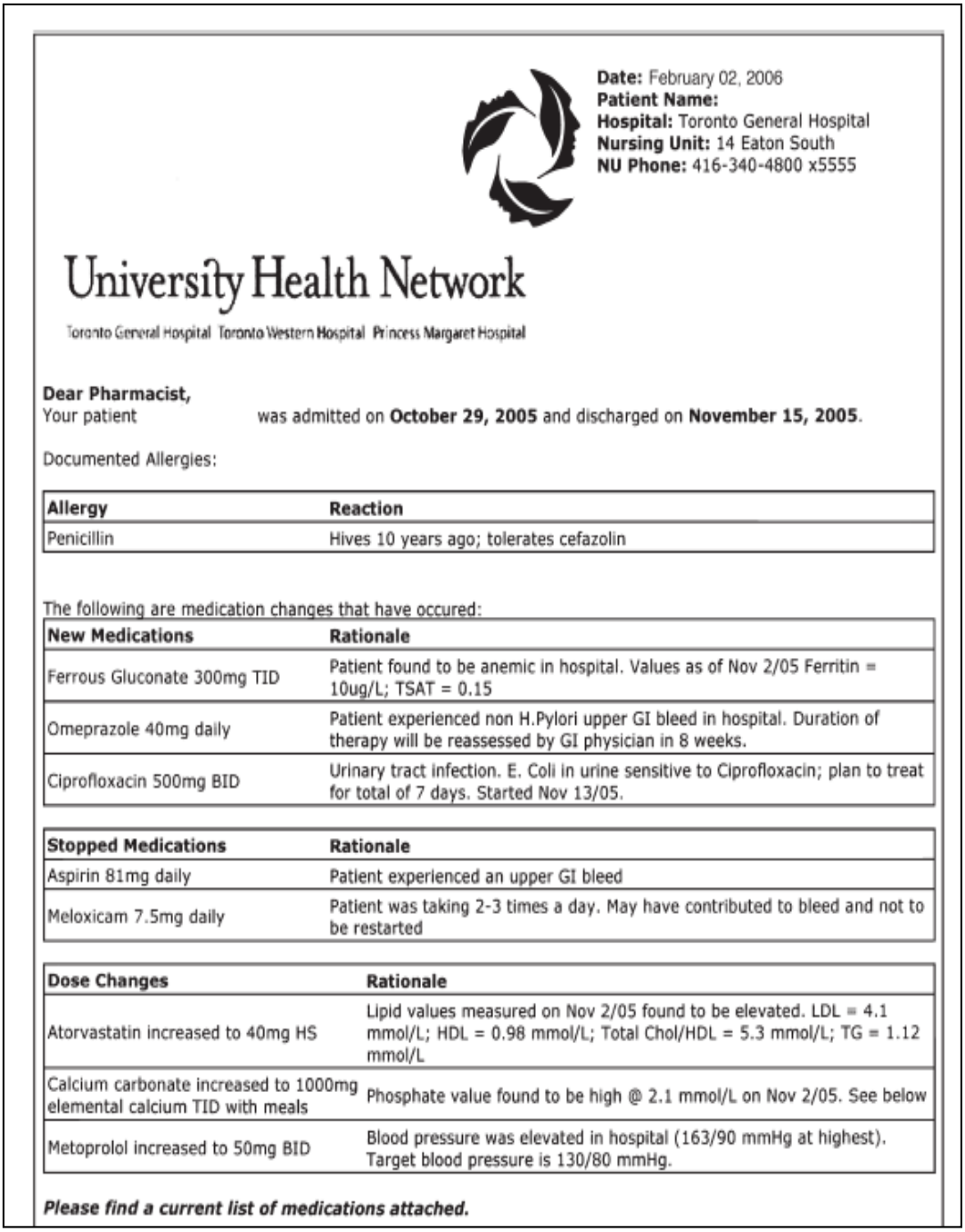
Medication information discharge letter

Summarizes changes since the BPMH to post-discharge regimen. This letter can include a list and rationale for discontinued medications, medications initiated in hospital, adjusted medications (dose and frequency changes) as well as outstanding patient issues that require ongoing monitoring and follow-up.



Date: February 02, 2006
Patient Name:
Hospital: Toronto General Hospital
Nursing Unit: 14 Eaton South
NU Phone: 416-340-4800 x5555

University Health Network

Toronto General Hospital Toronto Western Hospital Princess Margaret Hospital

Dear Pharmacist,
Your patient was admitted on **October 29, 2005** and discharged on **November 15, 2005**.

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.

Please find a current list of medications attached.

Used with permission

Please find a current list of medications attache

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. Dr. Smith (GI physician) 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,

Cesta,Annemarie, Pharmacist

Phone: **416-340-4800 x1234**
Pager: **416-555-8856**

Verbal consent was obtained from the patient to release the above information on **February 02, 2006**

Current medication list for 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

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5 Questions to Ask about Your Medications

The 5 Questions to Ask about Your Medications is a tool to help patients and caregivers start a conversation about medications to improve communications with their health care provider and is available in over 20 different languages.

Used with Permission

MEDICATION RECONCILIATION IN ACUTE CARE

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Appendix E

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