<table>
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<tr>
<th>Program Name:</th>
<th>Keeping patients safe with Medication Reconciliation: We all have a role to play</th>
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- Brenda Carthy, BA.CompSc |
| Accreditation Information: | This version of the program is unaccredited and intended for informational purposes only. An accredited version is available online at [www.rxBriefCase.com](http://www.rxBriefCase.com) until September 26, 2016. |
Contents

Learning Objectives ................................................................. 4

Pre/Post Survey ................................................................. 4

Introduction ............................................................................. 4

Meet our patient ....................................................................... 6

Revisit our patient ................................................................. 6

Overview of MedRec ............................................................. 7

What is Medication Reconciliation (MedRec)? ....................... 7

What is the difference between MedRec and Medication Review? ................. 9

Why Is MedRec Important? .................................................. 9

Making patient care safer ...................................................... 9

Accreditation/Regulatory Drivers ......................................... 11

When should MedRec take place? ........................................ 12

MedRec processes in hospital and long-term care settings .......... 14

What is the process for completing MedRec? ......................... 15

Overview of admission MedRec ............................................. 16

Admission Step 1 - Creating a BPMH ..................................... 17

What is a Best Possible Medication History (BPMH)? ............. 17

What is included in the BPMH? ............................................ 17

How is a BPMH patient or caregiver interview conducted? .... 18

Revisit our patient ............................................................... 18

Why is a patient/caregiver interview so important? .................. 24

Pharmacist Story - “Open the vials” ..................................... 24

Test your knowledge! ............................................................ 24

What are potential sources of medication information used to create a BPMH? .... 25

Test your knowledge ............................................................ 26

Revisit our patient ............................................................... 27

Where and how is the BPMH documented? ......................... 27

Revisit our Patient – In the Emergency Department ................. 30

Admission Step 2 – Reconciling Medications: ......................... 31

How are medications reconciled? ....................................... 31

Reconciliation Models .......................................................... 32

Test your knowledge ............................................................ 35

Back to our patient – From ER to Admission to unit ................. 35

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Learning Objectives

Upon successful completion of this continuing education lesson, the pharmacist will be better able to:

1. Define Medication Reconciliation (MedRec)
2. Discuss the benefits of MedRec
3. Utilize a systematic process during a patient interview to collect a Best Possible Medication History
4. Learn about available sources of medication information
5. Explain the reconciliation processes at admission to and discharge from hospital
6. Discuss the importance of documentation and communication as a patient transitions throughout the healthcare system
7. Appreciate the role of pharmacy staff can play in the ensuring safe transitions of care

Pre/Post Survey

Please answer the following questions on a scale of 1 to 5 (Low 1 – High 5):

1. How familiar are you with the concept of medication reconciliation and the differences between it and medication reviews?
2. How would you rate your knowledge of medication reconciliation by pharmacists in the hospital setting?
3. How would you rate your knowledge on the role of the pharmacy staff in medication reconciliation in the community setting?

Introduction

The following patient stories all share a common theme. Poor communication and/or poor utilization of medication information between patient to care provider and care provider to care provider can lead to patient harm.

1. A nursing home patient was receiving propranolol 20 mg/5 mL, at a dose of 5mL (20 mg) for hypertension twice a day, but the admitting orders were written as propranolol 20 mg/mL give 5 mL (which equates to 100 mg) twice a day. The patient received fives doses of the 100 mg strength before the error was discovered.

Excerpt from “Medication Errors Involving Reconciliation Failures”

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

3. A consumer had received a prescription from a psychiatrist for the antidepressant medicine citalopram, at a dose of 30 mg per day. Unfortunately, when asking a family doctor for a refill, the consumer relied on memory and said that the dose was 45 mg daily. The family doctor thought the dose seemed high and wrote a prescription for 40 mg daily. After the consumer had the prescription filled and started taking the higher dose, some side effects occurred.

Excerpt from SafeMedicationUse.ca newsletter “When It Comes to Your Medicines, Don’t Rely on Memory!”

4. At home, a patient takes warfarin daily to prevent a stroke secondary to his/her atrial fibrillation. They are booked for surgery and are advised by their surgeon to stop taking their warfarin 1 week prior to their surgery. Following the surgery upon discharge from hospital, the patient receives no instruction about resuming warfarin. Several weeks later, the patient suffers a stroke.

5. A patient with type 1 diabetes is admitted to hospital. Their home insulin regimen insulin is inadvertently not ordered upon admission. Three days after admission the patient is transferred to intensive care with diabetic ketoacidosis.

6. A patient has been taking warfarin. The patient’s family doctor wanted the consumer to start taking a different blood thinner instead, a medicine called dabigatran. Two months later, the patient was planning a cruise vacation and asked the pharmacy to provide refills for several medicines. The pharmacy gave the patient refills for both the warfarin and the dabigatran, and the consumer took both medicines for 5 days. During the cruise, the patient noticed that one leg had become dark and swollen. The ship’s physician diagnosed a severe hematoma that was caused by the use of the two blood thinners together. The ship’s physician advised the patient to stop taking the warfarin, as the family physician had originally intended, and the hematoma eventually improved.

Adapted from SafeMedicationUse.ca newsletter “An Important Question - Does this new medicine replace one of my current medicines?”

Medication reconciliation aims to improve the documentation and communication of complete and accurate medication information at transitions in care with the ultimate goal of preventing adverse drug events.

This program provides practical information to understand medication reconciliation (MedRec) and the role of patients, pharmacists and other healthcare providers in the process.
Meet our patient

It’s a slow Sunday afternoon in the pharmacy when Ms. Smith approaches you to ask a question. She says she just used the pharmacy’s blood pressure machine and she wants to know if her reading is ok. When you ask about her reading she pulls out a piece of paper where she wrote it down, it reads 180 over 100. When you ask her how she is feeling she describes a bad headache since she was discharged from the hospital 3 days ago.

Let’s consider how Ms. Smith came to developing this blood pressure concern and headache after her hospital stay and how effective medication reconciliation (MedRec) processes may have prevented this. MedRec is a process designed to reduce the potential for adverse drug events during this transition of care from the hospital to the community setting or vice versa. Stories of injury from preventable adverse drug events unfortunately remain a common occurrence due to either lack of or poor quality medication reconciliation practices during key transitions in care.

1. In a study of patients discharged from a hospital’s general medicine unit\(^5\), what was the estimated percentage of patients who experienced an adverse drug event (ADE) in the 24 day period following their hospital discharge?
   a. 4
   b. 11
   c. 25
   d. 63

2. Of these patients, what percentage of the ADEs was deemed to be either preventable or ameliorable?
   a. 10
   b. 20
   c. 60
   d. 90

Revisit our patient

One week before her pharmacy visit, Ms. Smith was brought into the emergency department by her family after becoming very confused and unwell at home. In triage, she was short of breath and was found to have a fever, low blood pressure and was showing signs of dehydration. She had a history of hypertension, osteoporosis and rheumatoid arthritis. Subsequent investigations in the emergency department determined that Ms. Smith had pneumonia and she was admitted to the hospital.

The physician notified the team of the admission and requested that the pharmacy technician in the emergency department initiate the admission MedRec process.
Overview of MedRec

What is Medication Reconciliation (MedRec)?

“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.”

MedRec processes can provide a foundation for medication reviews to identify drug-related problems (such as drug interactions, adverse drug reactions, drug use without indication, and inappropriate dosing) that may arise during an individual’s care over a period of time (see Figure 2).
Figure 2 - Relationship between BPMH, MedRec, medication review and medication management

Medication Management
Medication management is defined as patient-centred care to optimize safe, effective and appropriate drug therapy. Care is provided through collaboration with patients and their health care teams.

Clinical Medication Review
Addresses issues relating to the patient's use of medication in the context of their clinical condition in order to improve health outcomes.

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

Best Possible Medication History
A complete and accurate list of all the medications a patient is taking created using at least 2 sources of information including a client and/or family interview.

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/pharmcare
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

Image © 2014 ISMP Canada
What is the difference between MedRec and Medication Review?

MedRec is:
A structured process that ensures accurate and complete medication information is documented and communicated across transitions of care to minimize potential prescribing errors. 8

Clinical Medication Review is:
A process that ensures a patient is taking the appropriate medications for their condition(s) and optimizes their medication therapy. 9

Source: Lower Mainland Pharmacy Services Fraser Health MedRec Facilitators. Used with permission.

MedRec and clinical medication review are two examples of complementary system processes that function together. MedRec is intended to prevent medication errors at transition points in patient care, whereas clinical medication review is intended to address drug-related problems.

Please read ISMP Canada’s Ontario Critical incident bulletin which highlights the need for quality MedRec and Medication review.

Why Is MedRec Important?
Making patient care safer

The ultimate goal of MedRec processes is to prevent adverse drug events that may result from inaccuracies in medication history information and/or from incomplete use of and/or communication of medication information when a patient transitions within and between care settings. Transitions in care have been identified as points in care that are vulnerable to medication errors. 10

As shown in Figure 1, the “target” of MedRec processes is to reduce the incidence of preventable adverse drug events. Table 1 describes how a lack of reliable MedRec processes may lead to adverse drug events.
Table 1- Causes and examples of MedRec “failures”

<table>
<thead>
<tr>
<th>Harm to patient may result from:</th>
<th>For example, this may specifically result in:</th>
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<tbody>
<tr>
<td>Incomplete or inaccurate collection/documentation of a patient’s actual medication use</td>
<td>• the omission of regularly used medications&lt;br&gt;• addition of a medication no longer used&lt;br&gt;• differences in a medication’s dose or frequency</td>
</tr>
<tr>
<td>Unintentional changes to a patient’s medication regimen as medications are prescribed at transitions in care</td>
<td>• inadvertent omission of regularly used medications from hospital admission orders&lt;br&gt;• inadvertent inclusion of a medication no longer in use in hospital admission orders&lt;br&gt;• inadvertent changes to a medication’s dose or frequency in hospital admission orders</td>
</tr>
<tr>
<td>Ineffective use of medication information to guide safe medication management</td>
<td>• erroneous drug duplications&lt;br&gt;• interacting medications&lt;br&gt;• failing to use intended medications</td>
</tr>
<tr>
<td>Ineffective communication with patients and care providers about changes made to a patient’s medication regimen</td>
<td>• erroneous drug duplication&lt;br&gt;• non-use of intended medication&lt;br&gt;• use of unintended medication</td>
</tr>
</tbody>
</table>

Have you experienced a MedRec failure? [Report the medication incident to ISMP Canada](https://www.ismp.ca/)

Statistics from studies have demonstrated the need to implement effective MedRec processes. These include:
• Approximately 25% of hospital prescribing errors are attributable to incomplete or inaccurate medication histories at the time of admission.¹¹
• Over half (54%) of the patients admitted to hospital have at least 1 unintentional medication discrepancy at admission and 39% of these were judged to have the potential to cause moderate to severe discomfort or clinical deterioration.¹²
• Communication was the most frequently cited cause of medication errors reported to the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) between 1995 and 2003.¹³

Many studies have demonstrated the benefit of implementing effective MedRec processes*. These include decreases in:
• actual or potential adverse drug events¹⁴ ¹⁵ ¹⁶
• unintentional medication discrepancies¹⁷
• clinician re-work¹⁸
• hospital re-admissions¹⁹ ²⁰
• overall costs to the healthcare system ²¹

*Note: The majority of studies on the benefits of MedRec processes are based in a hospital/acute care environment.

For a more comprehensive summary of the existing MedRec literature, consult these systematic reviews:
• Mekonnen et al. “Pharmacy-led MedRec programmes at hospital transitions: a systematic review and meta analysis” (2016)
• Mekonnen et al. “Effectiveness of pharmacist-led medication reconciliation programmes on clinical outcomes at hospital transitions: a systematic review and meta-analysis” (2016)

Due to the potential for MedRec to beneficially impact safe patient care, many national and international organizations have supported or endorsed the implementation of MedRec including, Accreditation Canada, the Institute for Safe Medication Practices Canada (ISMP Canada), the Canadian Patient Safety Institute (CPSI), and the Institute for Healthcare Improvement (US) and World Health Organization’s ‘High 5s program’.

Accreditation/Regulatory Drivers
Implementation of MedRec processes has also become an important priority because of both accreditation and health professional regulatory frameworks.

Accreditation Canada has described requirements (known as required organizational practices or ROPs) or standards related to completion of MedRec processes²². Since 2005, acute care organizations have been required to have some degree of MedRec implemented for admitted patients (e.g., hospitalized patients). Accreditation-related MedRec expectations have continued to evolve over time. This includes expansion of the number of hospital care areas (or services) that have MedRec in place as well as the specific interfaces of care where MedRec is expected. Despite these processes being required, statistics on compliance with accreditation-related MedRec requirements in Canada would suggest that many organizations continue to face challenges when implementing MedRec²³.
The National Association of Pharmacy Regulatory Associations (NAPRA) includes the following standard in their Model Standards of Practice for Canadian Pharmacists document:

21. pass on information to health care professionals providing care to patients as required:
   • only in accordance with applicable laws, regulations and policies, and
   • to support safe and effective therapy, and
   • while maintaining patient confidentiality

29. identify and reconcile changes in patient’s medication-therapy:
   • to patients requesting this service, and
   • to patients who are at risk for medication-therapy problems related to transitions in health care services (e.g. hospitalization or discharge from hospital)

Click here to view a one-page poster that speaks to the importance of MedRec endorsed by many national organizations (including the Canadian Pharmacists Association & the Canadian Society of Hospital Pharmacists).

**When should MedRec take place?**
To improve medication safety, MedRec should occur at all interfaces of care across the continuum where the patient is at risk for medication discrepancies or adverse drug events. The care of patients may occur in multiple settings and at each handoff is an opportunity to improve the communication of the patient’s medications with MedRec. Figure 3 shows many potential interfaces of care within the healthcare system.
In addition to MedRec occurring during these more general transitions of care, specific transitions within these settings occur where MedRec processes may be warranted, as shown in Figure 4. For example, in a hospital setting these transitions might include at/upon 1) admission to hospital, 2) specific types of transfers within the hospital where orders need to be reviewed and rewritten according to facility policy (e.g. include changes in responsible medical service, changes in level of care and post-operative care), and 3) discharge from hospital. The specific MedRec processes that take place at admission and discharge will be described later in the program.
Figure 4- Potential Transitions of Care

©2013 ISMP Canada, Adapted from Queen’s University, Department of Family Medicine

MedRec processes in hospital and long-term care settings

Within hospital and long-term care settings, MedRec processes may be warranted at multiple transition points, including: admission, transfer, and discharge. In long-term care, MedRec may also be warranted on readmission to the facility (e.g. a resident from the facility is being readmitted following a brief hospital admission).
MedRec processes at admission and discharge will be described in detail as these transitions are most relevant to our patient Ms. Smith (and are a direct interface with community pharmacy).

**What is the process for completing MedRec?**

Regardless of the environment where medications may be managed, an up-to-date and accurate medication list is essential to ensure medication safety at each phase of the medication use process (e.g., prescribing, dispensing and administration).

The specific process to MedRec will differ depending on a number of factors:

- **The environment** in which the MedRec is taking place (e.g., an inpatient hospital unit, a long-term care setting, a home care setting, an ambulatory clinic setting, a primary care setting, etc.)
- **The type of transition point** (e.g., discharge from hospital, admission to home care, ambulatory clinic visit)
- **Organization-specific policies and procedures**

In Canada, MedRec processes in the context of specific environments are described in detail within five toolkits. These kits describe the process of MedRec and provide practical tools and resources to support the effective implementation of MedRec processes at transition points:

- Acute Care Getting Started Kit ([English](#)) ([Français](#))
- Long-Term Care Getting Started Kit ([English](#)) ([Français](#))
- Home Care Getting Started Kit ([English](#)) ([Français](#))
This program will focus on the MedRec process and will demonstrate how ineffective communication of medication information in the hospital setting has contributed to Ms. Smith’s presentation in your community pharmacy.

**Overview of admission MedRec**

The goal of admission MedRec is to ensure a conscious decision on the part of the patient’s prescriber to continue, discontinue or modify the medication regimen that a patient has been taking at home/prior to admission.

The process to achieve this goal involves a series of steps as shown. The BPMH takes place upon admission. As you will learn later in the program, this BPMH is also utilized at other transition points.

*Images adapted from WHO's High 5s MedRec Standard Operating Procedures*
Admission Step 1- Creating a BPMH

What is a Best Possible Medication History (BPMH)?

The BPMH is the cornerstone of the Medication Reconciliation process. As previously described, a poorly completed medication history can be a significant source of adverse drug events. A more thorough and accurate compilation of a patient’s actual medication use is needed. This is where the concept of a “Best Possible Medication History” comes into play.

A BPMH is created using a:25

1) systematic process of interviewing the patient/family; and

2) review of at least one other reliable source of information to obtain and verify all of the patient’s actual medication use (prescribed and non-prescribed).

Following the interview and review of the medication information sources, the BPMH documentation should include at minimum the drug name, strength (if applicable), dosage, route and frequency. More information on BPMH documentation will be described later in the program.

What is included in the BPMH?

The BPMH should include all:

• Prescribed medications, which may include prescribed over-the-counter (OTC) medications
• Non-prescribed medications, which may include over-the-counter (OTC) medications, vitamins, natural health products, or illicit/recreational drugs.26

Note:

• Organizations often specify what medications should be included in the BPMH (as is deemed relevant to their setting).
• 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 and/or a patient interview.

The BPMH should detail the patient’s actual use of the medication which may be different than what has been prescribed or dispensed.

Did you know?

Prior to the implementation of MedRec practices, a 2005 systematic review describing the frequency, type and clinical importance of medication history errors at the time of hospital admission found that 10-67% of patients had at least one prescription medication history error. When non-prescription medication errors were included the rate of at least one medication history error was 25-83%.27 Read the full article “Frequency, type and clinical importance of medication history errors at admission to hospital: a systematic review.”

Read more about the importance of an accurate medication history, including a description of the
specific benefits that accurate medication information provides a review of the consequences of poor medication histories and practical strategies to reduce medication history errors.

How is a BPMH patient or caregiver interview conducted?
Interviewing a patient or caregiver for the purposes of creating a BPMH requires a structured approach to ensure routine collection of the most accurate information. Many tools can assist individuals when conducting interviews. With education and experience, skills and efficiency in interviewing patients or families to create a BPMH will improve over time. The time required to complete a BPMH interview will vary depending on interviewer experience and a patient’s complexity of their medication regimen.

Did you know?
A 2013 Canadian study found that upon admission to either a hospital geriatric unit or internal medicine unit, the time required for discussion with the patient/family (as part of the overall BPMH creation process) ranged from 36 seconds to 31 minutes.

Revisit our patient
Using the BPMH Interview Guide shown in Figure 5, the pharmacy technician in the emergency department interviews Ms. Smith’s daughter. With Ms. Smith’s confusion, it is fortunate that her daughter is with her and that she is quite familiar with her mother’s home medication regimen.
Figure 5 - BPMH Interview Guide

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

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

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

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

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

Vitamins/Minerals/Supplements
- Do you take any vitamins (e.g., multivitamins)? If yes, how do you take (vitamin name(s))?
- Do you take any minerals (e.g., calcium, iron)? If yes, how do you take (minerals name(s))?
- Do you use any supplements (e.g., glucosamine, St. John’s Wort)? If yes, how do you take (supplements name(s))?

Eye/Ear/Nose Drops
- Do you use any eye drops? If yes, what are the name(s)? How many drops do you use? How often? In which eye?
- Do you use ear drops? If yes, what are the name(s)? How many drops do you use? How often? In which ear?
- Do you use nose drops/nose sprays? If yes, what are the name(s)? How do you use them? How often?

Inhaled/Patches/Creams/Ointments/Injectables/Samples
- Do you use inhaleds, medication patches, medicated creams or ointments, injectable medications (e.g., insulin)? For each, if yes, how do you take (medication name)? Include name, strength, how often.
- Did your doctor give you any medication samples to try in the last few months? If yes, what are the name(s)?

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

Closing
This concludes our interview. Thank you for your time. Do you have any questions?
If you remember anything after our discussion, please contact us to update the information.

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

Adapted from Delivering Health Care Now!

Image from Best Possible Medication History Interview Guide, Developed by ISMP Canada for Safer Healthcare Now!29

The Best Possible Medication History Interview Guide is available for purchase in the form of a laminated pocket card or as a PDF download.

A video developed by the Australian Commission on Quality and Safety in Healthcare is available where you can listen to a pharmacist provide coaching on how to interview a patient or caregiver to obtain a BPMH.30
Medication Reconciliation

How to ask questions for a Medication History

1. Ask about all medications:
   - Prescription
   - Over-the-counter
   - Anything from a herbalist or health store?
   - Herbs
   - Vitamins or supplements
   - Teas
   - Traditions remedies (from other countries?)

   Questions should be:
   - Balance open-ended questions with yes/no questions
   - Nonbiased questions
   - No leading questions
   - Vague responses may indicate non-adherence
   - Avoid medical jargon
   - Encourage questions from patient
   - Encourage bringing meds and use of medication wallet card
   - Give out wallet cards
   - Prompt regarding non-pill dosage forms and pms
   - Creams, drops, inhalers, spray, samples
   - Allergies: ask about symptoms
   - Use multiple sources of information:
     - Medication labels
     - Family
     - Community pharmacy
     - Family physician

2. Include:
   - name
   - dosage form
   - dose
   - schedule
   - last dose taken
   Note: (be specific about pm medications)

3. Ask about recently started medications, or dosage changes

Sample Questions for Medication History Interviews

1. Did the doctor change the dose or stop any of your medications recently?
2. Have you changed the dose or stopped any of your medications recently?
3. Have any of the medications been causing side effects?
4. Your profile indicates that you may have run out of some medications. Are you still taking any of these?
5. Have you spent any days in the hospital for the past year?
6. When you feel better, do you sometimes stop taking your medicine?
7. Sometimes if you feel worse when you take your medicine, do you stop taking it?
8. Have you changed your daily routine to accommodate your medication schedule?
Top 10 Practical Tips
How to Obtain an Efficient, Comprehensive and Accurate Best Possible Medication History (BPMH)

1. Be proactive. Gather as much information as possible prior to seeing the patient. Include primary medication histories, provincial database information, and medications vials/lists.

2. Prompt questions about non-prescription categories: over the counter drugs, vitamins, recreational drugs, herbal/traditional remedies.

3. Prompt questions about unique dosage forms: eye drops, inhalers, patches, and sprays.

4. Don’t assume patients are taking medications according to prescription vials (ask about recent changes initiated by either the patient or the prescriber).

5. Use open-ended questions: (“Tell me how you take this medication?”).

6. Use medical conditions as a trigger to prompt consideration of appropriate common medications.

7. Consider patient adherence with prescribed regimens (“Has the medication been recently filled?”).

8. Verify accuracy: validate with at least two sources of information.

9. Obtain community pharmacy contact information: anticipate and inquire about multiple pharmacies.

10. Use a BPMH trigger sheet (or a systematic process/interview guide). Include efficient order/optimal phrasing of questions, and prompts for commonly missed medications.

Adapted with permission from C. Fernandes PharmD, University Health Network, 2008

©2006 & 2008 ISMP Canada, Images developed by ISMP Canada for Safer Healthcare Now!
ISMP Canada, the Canadian Patient Safety Institute, Patients for Patient Safety Canada, the Canadian Pharmacists Association and the Canadian Society for Hospital Pharmacists have collaborated to develop a set of 5 questions to help patients and caregivers start a conversation about medications to improve communications with their health care provider. The poster is available in multiple languages.

It may be particularly helpful for patients to ask these questions at transitions of care. Examples include:
- doctor’s appointment (e.g. family physician or specialist, dentist, optometrist)
- interaction with a community pharmacist
- discharge from hospital to home
- visit by home care services

5 QUESTIONS TO ASK ABOUT YOUR MEDICATIONS when you see your doctor, nurse, or pharmacist.

1. CHANGES?
   Have any medications been added, stopped or changed, and why?

2. CONTINUE?
   What medications do I need to keep taking, and why?

3. PROPER USE?
   How do I take my medications, and for how long?

4. MONITOR?
   How will I know if my medication is working, and what side effects do I watch for?

5. FOLLOW-UP?
   Do I need any tests and when do I book my next visit?

Visit safemedicationuse.ca for more information.

©2016 ISMP Canada. Available at https://www.ismp-canada.org/medrec/5questions.htm
Tips for Conducting a Patient Medication Interview

I. Medication Information
To obtain or verify a list of the patient’s current medications, you should inquire about:
- Prescription medications
- Over-the-counter (OTC) drugs
- Vitamins
- Herbs
- Nutraceuticals/Health supplements
- Respiratory therapy-related medications (e.g., inhalers)

Full dosing information should be captured, if possible, for each medication. This includes:
- Name of the medication
- Strength
- Formulations (e.g., extended release, controlled delivery, etc.)
- Dose
- Route
- Frequency
- Last dose taken

II. Medication History Prompts
Incorporating various types of “probing questions” into the patient interview may help trigger the patient’s memory on what medications they are currently taking. Here are some suggestions:
- Use both open-ended questions (e.g., “What do you take for your high cholesterol?”) and closed-ended questions (e.g., “Do you take medication for your high cholesterol?”) during the interview.
- Ask patients about routes of administration other than oral medicines (e.g., “Do you put any medications on your skin?”). Patients often forget to mention creams, ointments, lotions, patches, eye drops, ear drops, nebulizers, and inhalers.
- Ask patients about what medications they take for their medical conditions (e.g., “What do you take for your diabetes?”).
- Ask patients about the types of physicians that prescribe medications for them (e.g., “Does your ‘arthritis doctor’ prescribe any medications for you?”).
- Ask patients about when they take their medications (e.g., time of day, week, month, as needed, etc.). Patients often forget to mention infrequent dosing regimens, such as monthly.
- Ask patients if their doctor recently started them on any new medicines, stopped medications they were taking, or made any changes to their medications.
- Asking patients to describe their medication by color, size, shape, etc., may help to determine the dosage strength and formulation. Calling the patient’s caregiver or their community pharmacist may be helpful to determine an exact medication, dosage strength, and/or directions for use.
- For inquiring about OTC drugs, additional prompts may include:
  - What do you take when you get a headache?
  - What do you take for allergies?
  - Do you take anything to help you fall asleep?
  - What do you take when you get a cold?
  - Do you take anything for heartburn?


2 For a full range of medications as defined by The Joint Commission, refer to its accreditation material.
Why is a patient/caregiver interview so important?
Despite records of medications prescribed or dispensed, patients or caregivers are often best positioned to confirm actual medication use. Patients may use medications differently than prescribed or dispensed for many reasons including intentional non-adherence, non-adherence due to poor understanding of instruction, verbal orders provided by caregivers, among other reasons. Many of the available sources of medication information available to healthcare providers do not include medication use beyond those prescribed and dispensed via a prescription.

Pharmacist Story - “Open the vials”
A pharmacist was interviewing a patient about her medications. She picked up a vial which was labelled ‘metformin 500 mg tablets’ and she asked the patient ‘how do you take these?’. The patient responded confidently “I take 1 tablet three times a day”. When the pharmacist opened the vial, to her surprise, she found that the vial contained Scotch mints.

Conducting a patient interview for the purposes of acquiring a BPMH can be challenging given patient specific factors that may be present such as:

- poor knowledge of their medication regimen
- inability to recall the specific information required or cognitive impairment
- language barriers
- limited health literacy
- lack of understanding of the importance of this information

Test your knowledge!
1. Approximately what percentage of primary care prescriptions written in Quebec are not filled/dispensed?
   a. 25%
   b. 30%
   c. 50%
   d. 66%
2. In a 2004 National survey, what percentage of Canadian adults had used a non-prescription product in the previous 6 months?
   a. 10%
   b. 35%
   c. 50%
   d. 66%
What are potential sources of medication information used to create a BPMH?

Various sources of medication information may inform BPMH, depending on the care setting, jurisdiction or patient. Also, sources of medication information differ in their comprehensiveness, quality, currency, ease-of-use and applicability. It is important for any individual asked to create a BPMH to understand the limitations of each information source. Since no one source of medication information is perfect, it may be necessary for clinicians to use multiple sources to synthesize the BPMH.

Table 2 highlights some commonly used sources of medication information

<table>
<thead>
<tr>
<th>Source</th>
<th>May be</th>
<th>Examples/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient/family-maintained medication list</td>
<td>Provided verbally</td>
<td>Knowledge is the Best Medicine Medication Record</td>
</tr>
<tr>
<td>Paper based</td>
<td></td>
<td>My MedRec “app” available for free download on Apple, Android and Blackberry devices</td>
</tr>
<tr>
<td>Patient/family provided medications containers or</td>
<td>Faxed or verbally communicated</td>
<td>Medication Review documents, “profile” reports</td>
</tr>
<tr>
<td>Community pharmacy dispensing report or medication review documentation</td>
<td>Accessed via a provincial drug information system or repository by authorized individuals</td>
<td>Care Net in AB, Drug Profile Viewer in ON, Drug Information System (DIS) in PEI &amp; NS, Pharmaceutical Information Program (PIP) in SK, Drug Program Information Network (CPIN) in MB, etc.**</td>
</tr>
</tbody>
</table>

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An accredited version is available online at www.rxBriefCase.com until September 26, 2016.
compliance/pill-packs

| Hospital records | Faxed or verbally communicated | Prior admission records/BPMH, Prior discharge records/discharge MedRec |
| Primary Care/Ambulatory records | Accessed via an organizational/provincial electronic health record | Previous discharge summaries or BPMHs Consult notes with medication history |
| Care setting medication administration records | Electronic medical record-based | PROMIS (BC Renal agency) database |
| Care setting medication administration records | Paper chart – based | |
| Care setting medication administration records | Faxed or verbally communicated | Medication Administration Records from home care or long term care provider |

*some personal health records may only be accessible for patients of specific organizations/provinces
** the availability of such systems, the comprehensiveness of information contained in these systems and the access to these systems outside of hospitals varies by province/territory

Note: It is important for any individual asked to create a BPMH to understand the limitations of each information source. The information gathered from these sources should, whenever possible be reviewed or validated with a patient or caregiver. This is why the patient or caregiver interview is a critical component of the overall MedRec process.

Improving access to the various sources of information may help make the process of obtaining a BPMH more effective and efficient across a variety of care settings. As provinces and territories invest in technologies to enable better sharing of information between care providers and care settings such as provincial health records or portals, pharmacists, pharmacy technicians and patients can advocate for the vital role that access to this type of information plays in providing optimal, safe and seamless patient care. Pharmacy staff can play a vital role in educating their patients about the importance of keeping an accurate up-to-date list of their medications and assisting patients in the maintenance of such lists.

Read more on the differences between medication information contained in community pharmacy records and emergency department triage records.

A humorous look at the practical challenges associated with sources of medication information can be found in this YouTube video entitled “BYOB”.

**Test your knowledge**

3. In a 2012 Commonwealth Fund Survey of Canadian Primary care physicians, what percentage of respondents indicated that they could easily generate a list of an individual patient’s medications?
Revisit our patient
The pharmacy technician has reviewed the Ms. Smith’s community pharmacy dispensing records through the provincial drug information system, and together with the information gathered from interviewing Ms. Smith’s daughter, she is now prepared to document the BPMH in Ms. Smith’s chart.

Where and how is the BPMH documented?
A BPMH is documented in a patient’s records but the specific location and manner in which this is done will vary by care setting, the MedRec model in use and organizational policy and procedures. Some organizations may use a paper-based system to document a BPMH while others may document this information electronically (e.g., in an electronic medical record, pharmacy information system or hospital information system).

Figure 6 is an example of the type of form that may be used to document a BPMH, specifically the section outlined in red. Note that for each medication listed on this form all of the necessary components of a medication order including drug name, dose, route and frequency are included.
Figure 6- Example of a form used to document a BPMH

MARKHAM STOUFFVILLE HOSPITAL

Medication Reconciliation Record and Doctor’s Orders

☐ NKA ☐ Date & Time:

Allergies:

Height: Weight: kg

*Nurse/Physician/Pharmacist to document home medications*

<table>
<thead>
<tr>
<th>Medication Name &amp; Strength (include prescription &amp; regularly taken OTC &amp; PRN medications)</th>
<th>Dose</th>
<th>Route</th>
<th>Dosing Interval</th>
<th>Continue</th>
<th>Change</th>
<th>Hold</th>
<th>Discontinue</th>
<th>Reason for Change/ Hold/Discontinuation</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

Source of Medication Information

☐ Review of patient medication list
☐ MAR from another facility
☐ Drug Profile Viewer
☐ Family physician list

Check ALL that apply

☐ Community pharmacy list:

☐ Patient/caregiver recall

☐ Other - specify:

Pharmacy Consult ☐ No ☐ Yes Reason for Consult:

Pharmacy Name:

Phone:

Completed by: Date/Time:

Physician Signature: Date:

Image used by permission by Markham Stouffville Hospital Corporation
In the hospital or long term care setting, the BPMH documentation may differ slightly depending on the reconciliation model in use. Two models describe how medications may be reconciled: the proactive model and the retroactive model. More information on these models will be provided later in the program.

Table 3 describes some tips and considerations when documenting a BPMH in a patient chart/record.

**Table 3- Tips for documenting the BPMH**

<table>
<thead>
<tr>
<th>Tips for documenting the BPMH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be aware of organizational policies that may describe organization specific guidance for documentation of medication information.</td>
</tr>
<tr>
<td>Avoid using <em>dangerous abbreviations</em>, identified as easily misinterpreted or involved in medication incidents leading to harm.</td>
</tr>
<tr>
<td>Record combination products as two generic medication names with their respective dosages. <em>e.g.</em>, Coversyl® Plus = perindopril 4 mg and indapamide 1.25 mg and include brand name for added clarification.</td>
</tr>
<tr>
<td>For liquid or injectable medications – record both the concentration and the total number of mg/mcg/units taken.</td>
</tr>
<tr>
<td>Be aware of medications that are in mcg vs. mg (<em>e.g.</em>, thyroid, fentanyl patches, puffers)</td>
</tr>
<tr>
<td>Record generic name where possible (but remember that patients are familiar with the brand name and therefore it may be useful to include that on the patient friendly medication lists)</td>
</tr>
<tr>
<td>Ensure the proper formulation of the medication is documented especially long acting vs. short acting. (<em>CR, SR, XR, ER, LA</em>)</td>
</tr>
<tr>
<td>Certain medications have to be taken at exact times or a period of time in relation to other medications. (<em>e.g.</em>, levodopa/carbidopa, tacrolimus, domperidone, metolazone, alendronate, and furosemide) Be specific about documenting the time of day and how it should be taken. (<em>e.g.</em>, with food or before/after meals)</td>
</tr>
<tr>
<td>Patients who take partial (<em>e.g.</em>, half/quarter) or multiple tablets (2 or 3) record the total amount taken in mg or mcg and the tablet strengths that the patient has to facilitate the discharge prescription writing process.</td>
</tr>
<tr>
<td>If patient is taking a medication differently than what is prescribed, record what the patient is actually taking. Document how the medication was prescribed by writing a progress note to describe the reason for the patient taking the medication differently or in a comment section to the prescriber or directly discuss this with the prescriber and document that you had the discussion.</td>
</tr>
<tr>
<td>When documenting medications taken in a cyclical fashion (<em>e.g.</em> take for 1 week then do not take or three weeks), be sure to include specific details of start and stop dates.</td>
</tr>
</tbody>
</table>

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Note: Information regarding non-adherence to prescribed medications or recent but non-current relevant medication use (e.g., antibiotics) may be important to ascertain and document for the purposes of more comprehensive medication management. However, this documentation should be distinct from the BPMH. As such, information of this nature is often documented or communicated in the computer/information system or in a general/progress notes section of the chart.

Revisit our Patient – In the Emergency Department

After collecting information from the community pharmacy, and interviewing Ms. Smith and her daughter, the pharmacy technician had prepared and documented the BPMH as follows in the patient’s chart:

Meanwhile, the admitting prescriber, wrote the following admission orders in the patient’s chart:
### Admission Step 2 – Reconciling Medications:

**How are medications reconciled?**

To reconcile: “To settle or resolve; to make consistent; to check against another for accuracy; to account for”


Just as one might reconcile a chequebook to make sure that all cheques are properly accounted for in their bank account transactions, it is necessary to reconcile the medications that the patient was taking prior to admission (BPMH) to make sure they are accounted for in the admission orders to hospital.

To reconcile the BPMH and admission orders, we compare the two lists of medications to identify differences between them. These differences are often referred to as “**discrepancies**”. Broadly these are unexplained differences in documented medication regimens across different sites of care.
Reconciliation Models

As referenced in the previous section, in acute care and long term care settings two main reconciliation models or processes have emerged from this desire to decrease or eliminate discrepancies between the BPMH and the admission orders: the **proactive model** and the **retroactive model**. The major difference between these two models is in the timing of when the BPMH is created and compared to the admission orders.

**Proactive Model**

The proactive model for MedRec occurs when the BPMH is created first and it then leads directly to corresponding Admission Medication Orders. Usually the BPMH is documented on the same form as where admission orders are “written”.

**Figure 7 – Graphic depicting the proactive MedRec model**

![Image from Safer Healthcare Now! Acute Care Getting Started Kit](image)

As you can see from the example proactive MedRec form in [Figure 8](image), the prescriber is asked to explicitly communicate their intended prescribing action (e.g., continue, discontinue, etc.) for each of the medications listed in the BPMH. In doing so, in theory they are completing the reconciliation of the BPMH and the admission orders. Ideally, in addition to the prescriber clearly documenting their intended prescribing, it is also crucial for prescriber to provide the rationale for the changes as this information will be useful for MedRec at discharge.
Retroactive Model

In a retroactive model, the prescriber writes admission orders and at a time following admission, a BPMH is collected. The lists are then compared to identify discrepancies. Two different types of discrepancies are likely in this model. These are known as undocumented intentional discrepancies and/or unintentional discrepancies. Without explicit documentation or communication from a prescriber it is often necessary to clarify with a prescriber their intent when a discrepancy is identified. This is needed to determine if the discrepancy was intentional or unintentional. The number of discrepancies is highly dependent on the source for the primary medication history used by the prescriber to write admission orders and their documentation practices around their therapeutic decision making.
Figure 9- Graphic depicting the retroactive MedRec model

Developed by ISMP Canada for Safer Healthcare Now!

Figure 10 illustrates the various comparisons to the BPMH that occur at each specific transition point within an acute care/hospital setting when MedRec has been implemented. It is important to note that the BPMH created at the time of admission is used throughout the MedRec process in the hospital. This is why ensuring the BPMH has been created using a rigorous and systematic process, as previously described is vital to an effective overall MedRec process.

Figure 10- Overview of the MedRec processes in Acute Care

Image from Safer Healthcare Now! Acute Care Getting Started Kit!
Test your knowledge

4. Based on Ms. Smith’s case described, this hospital has a:
   a. Proactive MedRec model at admission
   b. Retroactive MedRec model at admission

Back to our patient – From ER to Admission to unit
Ms. Smith is brought to the Medicine Unit late in the evening. Organizational policy at this hospital states that it is the interprofessional responsibility of nursing and medicine to ensure that MedRec has taken place. However, because this is a new process and the transfer to the unit occurred in the overnight hours the staff forget to complete the second step of the MedRec process for Ms. Smith.
### Test your knowledge!

1. What is the second step of the MedRec process?
   - a. Reconciling the medication
   - b. Creating a BPMH
   - c. Documenting and Communicating

2. Had the reconciliation of Ms. Smith’s BPMH and the admission orders occurred, what would have been identified?
   - a. Nothing
   - b. Her dose of folic acid was incorrect in the admission orders
   - c. Her Calcium and Vitamin D were omitted from the admission orders

3. Based on the information provided, this discrepancy that has been identified above, is an example of:
   - a. An undocumented intentional discrepancy
   - b. An unintentional discrepancy
   - c. Not sure, you would have to speak to the prescriber do ascertain their intent
Admission Step 3- Documenting and Communicating:

**Revisit our patient**

If discrepancies are identified, it is important to communicate with care providers to resolve them. The communication and documentation of the resulting reconciled medication orders/list is the final step in the process.

Assuming the reconciliation step had occurred at the time of Ms. Smith’s admission, in order to complete the overall MedRec process, the medicine unit staff would have communicated with the admitting prescriber to clarify whether Ms. Smith’s calcium and vitamin D was intentionally or unintentionally omitted from the admission orders. The staff may also clarify the prescriber’s rationale for holding many of her home medications (e.g., perindopril, hydrochlorothiazide, and methotrexate).

Upon discussion with the prescriber, the staff members learn that the prescriber:

1) Intended not to order the calcium and Vitamin D (did not want the calcium/vitamin D to interact with the newly started levofloxacin)
2) Held the perindopril and hydrochlorothiazide (due to low blood pressure and decreased kidney function secondary to dehydration)
3) Held the methotrexate (due to treatment of an active pneumonia)

The medicine unit staff members then document this information in Ms. Smith’s progress notes. With this communication and documentation, the MedRec at admission process would now have been complete (based on this organization’s specific MedRec process).

After a 3 day stay in hospital, Ms. Smith’s pneumonia is showing signs of improvement and she is ready for discharge to home. During her stay in hospital when her confusion resolves, Ms. Smith asks why she is no longer receiving her blood pressure medications or her methotrexate, she is advised by staff that these were not ordered because of her low blood pressure and her active pneumonia. Of note, the organization has not yet implemented a discharge MedRec process. At the time of discharge, Ms. Smith is provided with an envelope that contains a hand written discharge note which she is asked to bring to her family physician within a week of her discharge from hospital. She is also given the following prescription:
Ms. Smith comes to your pharmacy to have this prescription filled following her discharge. The antibiotic is dispensed and she is counselled on the appropriate use of the medication.

Let’s consider how Ms. Smith’s discharge may have been different had a discharge MedRec process taken place....

**Overview of Discharge MedRec**

The goal of discharge MedRec is to reconcile the medications that a patient was taking prior to admission (BPMH), those initiated or adjusted in hospital, and the medications the patient should take post-discharge. This process ensures that changes made to medications are intentional and discrepancies, where they may exist are resolved. Another important goal of discharge MedRec is to effectively communicate and document a discharge medication plan to the patient and to healthcare providers involved in the care of the patient.

Discharge MedRec attempts to formalize the concept of seamless care by facilitating the “handoff” of relevant information for ongoing patient medication management.

Creating and communicating a Best Possible Medication Discharge Plan (BPMDP) is a tool to facilitate achieving these goals. Relative to the BPMH, the BPMDP itself should allow for evaluation and accounting for:

- New medications (including those started in hospital and at the time of discharge)
- Discontinued medications
- Adjusted or changed medications
- Unchanged medications

Key components of a BPMDP include:

- An up-to-date and accurate list of medications the patients should be taking at discharge
- A medication information transfer letter to next care provider(s)
- A structured discharge prescription to next care provider(s)
- A patient medication information calendar/grid

Depending on the organization, these components may be combined into a common document (e.g., discharge prescription and medication information transfer letter). As a component of the medication information transfer to next care providers, hospital-based care providers should ideally include information on the rationale for changes to a patient’s previous medication regimen as well as specific information around required/desired monitoring of medication therapy (e.g., blood collection, primary care assessment, etc.)

**How is discharge MedRec performed?**

Similar to the admission MedRec process discharge MedRec involves a series of steps, as shown Figure 11, to achieve the discharge specific goals described above.

**Figure 11- Steps to conduct MedRec at discharge**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Create the BPMDP</td>
<td>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;</td>
</tr>
<tr>
<td>2. Identify all discrepancies between the BPMH and the last 24-hour MAR or medication profile</td>
<td>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.</td>
</tr>
<tr>
<td>3. Resolve and document any discrepancies with the prescriber.</td>
<td>Prescriber reviews and completes the BPMDP, makes adjustments and writes new prescriptions as appropriate.</td>
</tr>
<tr>
<td>4. Communicate BPMDP to the patient and the next providers of care</td>
<td>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.</td>
</tr>
</tbody>
</table>

**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**

**BPMDP= Best Possible Medication Discharge Plan**

**MAR= Medication Administration Record**
Image from Safer Healthcare Now! Acute Care Getting Started Kit

See a one page printable checklist that reviews the steps for completing a BPMDP.

See Hospital to Home - Facilitating Medication Safety at Transitions: Toolkit and Checklist for Healthcare Providers. The goal of using a medication-focused transition checklist is to increase patient safety by reducing medication errors and incidents that occur when a patient transitions from hospital to home.

Formulary Substitutions

A common source of discrepancies at the time of discharge (i.e. would be identified between a patient’s BPMH and their in-hospital medication administration record (MAR)), will involve those created from formulary auto-substitutions of medications. Formulary auto-substitutions occur when a specific order for one medication may be automatically substituted using a different, but therapeutically equivalent medication. This may be done as an in-hospital cost containment measure or to help guide appropriate prescribing. Auto-substitutions may also be used to provide for a non-formulary/non-stocked medication.

Examples might include:

- Non-formulary combinations product (e.g. ramipril/hydrochlorothiazide combo pill) may be dispensed instead the individual components of the combination product.
- Non-formulary medication (e.g. a particular ace inhibitor) may be dispensed instead with a specific equivalently dosed ace inhibitor (e.g., ramipril).

Depending on organizational policies and procedures and prescribing practices, these auto-substitutions may or may not be identified as a discrepancies at the time of admission. This means that a discharge MedRec process may be the only opportunity for the difference between a patient’s BPMH and their MAR (i.e. a discrepancy) to be resolved before the patient is discharged. In most cases, unless otherwise clinically indicated, patients will resume the medication taken prior to admission to hospital. This may be for convenience, simplicity or to take into account medication cost/coverage issues as the patient returns home.

Did you know?

A 2011 Canadian study found that patients admitted to hospital had a significantly increased likelihood of having several classes of chronic medications unintentionally discontinued as compared to non-admitted controls.

Reference “Association of ICU or Hospital Admission With Unintentional Discontinuation of Medications for Chronic Diseases”33
Test your knowledge!

8. Assuming Ms. Smith's blood pressure had normalized and her pneumonia was resolving, what might her hospital-based care providers have identified by completing a discharge MedRec process?
a. Ms. Smith was non-adherent to her medications
b. Ms. Smith should be restarted on her medications for blood pressure, and rheumatoid arthritis.
c. Ms. Smith is at risk for a drug-drug interaction (calcium and levofloxacin)
d. B and C

Revisit our patient
Using the steps of the discharge MedRec process described previously, let’s consider how Ms. Smith’s discharge process may have proceeded if a discharge MedRec process had been in place at this hospital.

<table>
<thead>
<tr>
<th>Step</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Creating a Best Possible Medication Discharge Plan (BPMDP)</td>
<td>Based on Ms. Smith current medication administration record (MAR) a list of medications for discharge would be prepared. These medications would be compared to Ms. Smith’s BPMH (at the time of admission).</td>
</tr>
<tr>
<td>2. Identify all the discrepancies between the BPMH and the MAR/current medication profile</td>
<td>As a result of the comparison, four of the medications (perindopril, hydrochlorothiazide, methotrexate and calcium/vitamin D) included in the BPMH would have been identified as a discrepant. Levofloxacin would also have been identified as a “new” medication relative to the BPMH.</td>
</tr>
<tr>
<td>3. Resolve and document any discrepancies with the prescriber</td>
<td>To clarify the intended prescribing action for each of these medications (i.e., to continue as previous, change, or discontinue), the unit staff would need to reconcile these discrepancies by confirming the intent of the prescriber. Upon doing so, the prescriber indicates that they feel the patient can safely resume all of these medications upon discharge based on their clinical assessment on the day of discharge. This is documented accordingly in the chart.</td>
</tr>
<tr>
<td>4. Communicate BPMDP to the patient and the next providers of care</td>
<td>Ms. Smith’s finalized BPMDP would be communicated to her and/or her family. The pharmacist on the unit reviews the BPMDP with Ms. Smith to ensure she understands any changes made to her previous medication regimen. The pharmacist provides Ms. Smith with a copy of the BPMDP and explains to the patient that this is to be brought to the pharmacy as it contains both a prescription for her antibiotic and important information about her medications for her community pharmacist (see example in Figure 12). The pharmacist also provides Ms. Smith with an up-to-date medication calendar (see example in Figure 13). The unit clerk also faxes a copy of the Ms. Smith’s BPMDP to her primary care physician.</td>
</tr>
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</table>
Figure 12 - Example of a BPMDP/Prescription document

Community Hospital Best Possible Medication Discharge Plan/Prescription

Ms. Smith  
DOB: June 2, 1943

<table>
<thead>
<tr>
<th>Continue at home:</th>
<th>Prescriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perindopril 4 mg daily</td>
<td></td>
</tr>
<tr>
<td>Hydrochlorothiazide 25 mg daily</td>
<td></td>
</tr>
<tr>
<td>Alendronate 70 mg once weekly</td>
<td></td>
</tr>
<tr>
<td>Calcium and Vitamin D 650 mg/800 units twice daily</td>
<td></td>
</tr>
<tr>
<td>Methotrexate 25 mg by mouth once weekly</td>
<td></td>
</tr>
<tr>
<td>Folic Acid 5 mg once weekly</td>
<td></td>
</tr>
<tr>
<td>Celecoxib 100 mg twice daily</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New:</th>
<th>Mitte: 2 tabs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levofloxacin 500 mg daily x 2 days</td>
<td>No refill</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discontinued:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Changed:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
<td></td>
</tr>
</tbody>
</table>

Dr. Discharging Doc

Image © 2016 ISMP Canada
Best Possible Medication Discharge Plan/Prescription for care providers*

<table>
<thead>
<tr>
<th>Continue (Unchanged since Admission)</th>
<th>Fill Prescription: See Quantity and refills below, exceptions as follows:</th>
</tr>
</thead>
<tbody>
<tr>
<td>metFORMIN 500mg PO TID CC</td>
<td></td>
</tr>
<tr>
<td>levotiroxine 50mcg PO DAILY</td>
<td></td>
</tr>
<tr>
<td>Cholecalciferol 1000 Units PO DAILY</td>
<td></td>
</tr>
<tr>
<td>atorvastatin 40mg PO QHS</td>
<td></td>
</tr>
</tbody>
</table>

| Changed                              |                                                                     |
|--------------------------------------|                                                                     |
| hydrochlorothiazide 25mg PO QAM      |                                                                     |
| Dose decreased Current BP 120/80mmHg |                                                                     |

| New                                  |                                                                     |
|--------------------------------------|                                                                     |
| calcium carbonate 1.25mg (500mg element) PO BID |                     |
| alendronate 30mg PO 1x week (on Monday mornings) |                      |
| acetaminophen 1000mg PO CID          |                                                                     |
| cyanocobalamin (Vitamin B12) 1000mcg PO DAILY |                     |
| nicotine patch 2mg PO-QAMH         |                                                                     |
| Patient registered with Quitnow.ca and counselled on smoking cessation |               |

| Discontinue                          |                                                                     |
|--------------------------------------|                                                                     |
| amitriptyline                         |                                                                     |
| May have been contributing to patient confusion |                        |
| ibuprofen                             |                                                                     |
| Can't 50mg/1ml, May worsen renal function, Changed to acetaminophen |           |

Image adapted from Vancouver Island Health Authority discharge MedRec documentation

*Note this example includes some rationale for changes made to the patient’s BPMH.

See an example of a Best Possible Medication Discharge Plan (BPMDP) template.

The importance of patient engagement at discharge

In situations where patients will be returning to a self-care situation (or self-care supported by family), sufficient understanding of their medication regimen is important at the time of discharge.

- Encourage patients to connect and talk with their community pharmacist and where provincial medication review funding is available, encourage them to book an appointment. The 5 Questions to Ask About your Medications will help start the conversation.

- Use the teach-back method. Teach-back is a way to confirm that you have explained to the patient what they need to know in a manner that the patient understands. Examples include: “I want to be sure that I explained your medication correctly. Can you tell me how you are going to take this medicine?” or “What are you going to do when you get home?”

- Ensure patients have and understand the medication information they need. Provide tips to help them ask questions about medications. (e.g., It’s safe to ask campaign, Knowledge is the Best Medicine, 5 Questions to Ask About Your Medications). Understand that patients have different levels of health literacy and ensure the medication information you provide is at their level and in a format they can understand.

- Encourage patients to keep and maintain a current medication list (paper or electronic using a mobile device (e.g., My MedRec app) and to bring their medication list or their medications when seeking care. (e.g., family doctor, specialists, clinic appointments)
Ensure all changed or discontinued medications are clearly communicated to the patient or family/caregiver and they understand the reason why, e.g., auto-substituted, liquid to tablets.

**Figure 13- Example of a patient-directed medication calendar**

![Discharge Medication Calendar](image)

<table>
<thead>
<tr>
<th>Medication</th>
<th>Breakfast</th>
<th>Lunch</th>
<th>Supper</th>
<th>Bedtime</th>
<th>Reason for taking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perindopril 8 mg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lowers blood pressure</td>
</tr>
<tr>
<td>Take at supper</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Hydrochlorothiazide 25 mg</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>Lowers blood pressure</td>
</tr>
<tr>
<td>Take in the morning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alendronate 70 mg</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Bone Strength</td>
</tr>
<tr>
<td>Take once a week on Monday mornings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium 659 mg/Vitamin D 800 units</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>Bone Strength</td>
</tr>
<tr>
<td>Take twice daily with breakfast and supper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methotrexate 25 mg</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Rheumatoid Arthritis</td>
</tr>
<tr>
<td>Take once a week on Wednesday mornings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Folic Acid 5 mg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Supplement to prevent side effect from methotrexate</td>
</tr>
<tr>
<td>Take once a week on Friday mornings</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Celecoxib 100 mg</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>Pain/Rheumatoid Arthritis</td>
</tr>
<tr>
<td>Take twice daily</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levofoxacin 500 mg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Antibiotic for pneumonia</td>
</tr>
<tr>
<td>Take once daily at bedtime for 2 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Image © 2016 ISMP Canada*

See a one page printable checklist that describes specific components of patient education that should be reviewed at the time of discharge from hospital.
A Patient/Caregiver Best Possible Medication Discharge Plan Educational Tool

<table>
<thead>
<tr>
<th>Medication</th>
<th>Breakfast</th>
<th>Lunch</th>
<th>Supper</th>
<th>Bedtime</th>
<th>Reason for Taking</th>
</tr>
</thead>
<tbody>
<tr>
<td>metFORMIN (Glucophage) 500mg</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td>Blood sugar</td>
</tr>
<tr>
<td>levothyroxine (Synthroid, Eltroxin) 50mcg</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Thyroid replacement</td>
</tr>
<tr>
<td>Cholecalciferol (Vitamin D) 1000 Units</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Bone strength</td>
</tr>
<tr>
<td>atorvastatin (Lipitor) 40mg</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td>Cholesterol</td>
</tr>
<tr>
<td>hydrochlorothiazide (Hydrodiuril) 25mg</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Blood pressure</td>
</tr>
<tr>
<td>calcium carbonate (Tums, Os-Cal) 1250mg (500mg elemental)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Bone strength. TAKE ON MONDAYS ONLY.</td>
</tr>
<tr>
<td>alendronate (Fosamax) 70mg</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>Bone strength.</td>
</tr>
<tr>
<td>acetaminophen (Tylenol) 1000mg</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Pain control</td>
</tr>
<tr>
<td>cyanocobalamin (Vitamin B12) 100mcg</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td>Vitamin B12 supplement</td>
</tr>
<tr>
<td>nicotine patch 21mg</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>Smoking cessation. NOT IN BLISTER PACK.</td>
</tr>
</tbody>
</table>

Stop Taking and Reason for Stopping

<table>
<thead>
<tr>
<th>Medication</th>
<th>Reason for Stopping</th>
</tr>
</thead>
<tbody>
<tr>
<td>amitriptyline</td>
<td>May have been contributing to confusion</td>
</tr>
<tr>
<td>ibuprofen</td>
<td>Harmful to kidneys. Changed to acetaminophen</td>
</tr>
</tbody>
</table>

Image adapted from Vancouver Island Health Authority discharge MedRec documentation

See an example of a Discharge Medication Schedule/Calendar template.

Revisit our patient

Now that we have reviewed Ms. Smith’s recent course of events, let’s re-consider the information provided initially in this program:

It’s a slow Sunday afternoon in the pharmacy when Ms. Smith approaches you to ask a question. She says she just used the pharmacy’s blood pressure machine and she wants to know if her reading is ok. When you ask about her reading she pulls out a piece of paper where she wrote it down, it reads top number 180 and bottom number 100. When you ask her how she is feeling she describes that she has had a bad headache since she was discharged from the hospital 3 days ago.

Upon review of Ms. Smith’s medication profile, you ask Ms. Smith if she has been taking her blood pressure medications. Ms. Smith responds that these medications were stopped while she was in the hospital so she had not been taking them. In fact, she tells you that the only medications that she has been taking since being discharged are levofloxacin, alendronate, calcium/vitamin D and celecoxib. She tells you that she was not able to get into see her family physician until Tuesday. You are able to get in touch with the discharging physician at the hospital, who indicates that the patient should have resumed her perindopril, hydrochlorothiazide and methotrexate. You counsel Ms. Smith accordingly and remind her to separate the dosing times of her levofloxacin and her calcium/vitamin D.
MedRec and the Role of Pharmacy Staff

As a retail pharmacist in a busy pharmacy, my workday is filled with challenges. We are often presented with patients who have been discharged after a hospital stay, and usually they have a list of new or modified prescriptions. Occasionally, the patient presents with a MedRec done on discharge from hospital. This document is usually beneficial to us in recognizing changes to pre-hospital meds, and for new meds. We appreciate the work that a hospital pharmacist or discharge planner puts into such a document to provide continuity of care. Where these documents sometimes “drop the ball” is in the case where the patient has active medications on their profile that are not mentioned on the MedRec as continued or discontinued. We, at the retail level, are left to wonder what to do about these medications. Unfortunately, the document loses its value for us in these cases. Recently I received a MedRec for a discharged patient along with written prescriptions for meds ordered for that patient while hospitalized. Written at the end of the MedRec was the sentence, “this is a complete list of all current medications for this patient. Please discontinue any prescriptions on file not mentioned in this document.” I must tell you that from the perspective of a retail pharmacist, this simple sentence makes the MedRec INVALUABLE to me. I now know that I have in front of me the most up to date and complete list of ALL the prescriptions this patient is on. I appreciate the value of the MedRec within the hospital and long term care environments. The document is very helpful to us in the retail setting, but a simple statement like the one above is, without a doubt, the most valuable to me. I hope that eventually, ALL discharged patients from ALL hospitals will present at my counter with a complete MedRec that includes the above statement.

--Community pharmacist, Prince Edward Island

What is the role of the pharmacy staff in MedRec?

Pharmacists have many opportunities to contribute to effective MedRec processes, whether in community or hospital practice. The actual roles and responsibilities of hospital based pharmacists in MedRec will differ by organization depending on available staffing resources. MedRec models differ from hospital to hospital and within a hospital from unit to unit.

The hospital pharmacist’s role in MedRec is frequently to coordinate the process. The pharmacist, wherever possible, should take primary responsibility for ensuring proper communication of medication information to patients and other healthcare providers on admission, transfer and discharge. The pharmacist also ensures that medications are selected and ordered appropriately based on the patient’s clinical condition and other factors. The pharmacist can play a key role in educating other health care providers on how to obtain a Best Possible Medication History and to do MedRec at admission, transfer and discharge. If pharmacists are not available, the organization is responsible for creating a model to ensure MedRec occurs. (e.g., nursing model) and ensuring that training to support practitioners is provided.

- Listen to a hospital pharmacist describe her role as a pharmacy discharge facilitator.
- Review the Canadian Society of Hospital Pharmacists Position Statement “Medication Reconciliation: Statement on the role of the Pharmacist”.
As described previously in the program, community pharmacists can play an important role in providing information required for the creation of a BPMH (e.g., providing medication profile information). Community pharmacists providing provincially funded medication review services also provide a great source of information on actual medication use. In fact, in some communities, hospitals have partnered with community pharmacies to provide medication review services (for those patients covered) to facilitate the creation of a BPMH for booked admission to the hospital (i.e., a booked surgery). Similarly hospitals have engaged community pharmacists to complete a post-hospital discharge medication review (where funded).

Table 3 describes other ways in which community pharmacy staff might engage in MedRec-related activities.

Table 3- Community Pharmacy MedRec engagement strategies

<table>
<thead>
<tr>
<th>With Patients</th>
<th>With Other Care Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Educate your patients that their community pharmacist can assist them in</td>
<td>• Engage your local hospitals and healthcare teams in discussions to understand the status of their MedRec implementation efforts.</td>
</tr>
<tr>
<td>preparing for an encounter with another care provider including a booked visit</td>
<td>• Ask your local hospitals or relevant provincial organizations to develop mechanisms to better communicate when a patient has been discharged and their medication regimen has been altered.</td>
</tr>
<tr>
<td>to a hospital, a primary care or specialist appointment, a home care nurse,</td>
<td>• Ask to participate in local MedRec committees to help develop forms, and processes that incorporate input from community pharmacists.</td>
</tr>
<tr>
<td>etc.</td>
<td>• Seek clarification from other care providers as needed when changes to medications are made and the patient does not understand the change or the reason for the change.</td>
</tr>
<tr>
<td>• When a patient presents with a prescription, ask if they are aware of other</td>
<td>• Share and demonstrate the use of the ‘5 questions to ask about your medications’ and remind them to use it at their next doctor’s appointment or hospital visit.</td>
</tr>
<tr>
<td>recent changes made to their medication regimen. If there has been, ask them if</td>
<td></td>
</tr>
<tr>
<td>they understand their new medication regimen.</td>
<td></td>
</tr>
<tr>
<td>• If it appears a patient may have been in hospital, ask the patient to share</td>
<td></td>
</tr>
<tr>
<td>any documents that they may have received related to their medications.</td>
<td></td>
</tr>
<tr>
<td>• When prescriptions are brought in or at the time of counselling, ask patients</td>
<td></td>
</tr>
<tr>
<td>if they are taking any other medications beyond their prescription medications</td>
<td></td>
</tr>
<tr>
<td>on profile. Update the pharmacy records accordingly.</td>
<td></td>
</tr>
<tr>
<td>• Encourage patients to maintain their own up-to-date medication list and to</td>
<td></td>
</tr>
<tr>
<td>show it to care providers whenever they receive care. Make them aware of tools</td>
<td></td>
</tr>
<tr>
<td>to support this activity (e.g. apps, websites, etc).</td>
<td></td>
</tr>
<tr>
<td>• When changes to medications are made, discuss with the patient their</td>
<td></td>
</tr>
<tr>
<td>understanding of the changes.</td>
<td></td>
</tr>
<tr>
<td>• Share and demonstrate the use of the ‘5 questions to ask about your</td>
<td></td>
</tr>
<tr>
<td>medications’ and remind them to use it at their next doctor’s appointment or</td>
<td></td>
</tr>
<tr>
<td>hospital visit.</td>
<td></td>
</tr>
</tbody>
</table>
Did you know?

A study with a hospital pharmacist supported “bundle” that included MedRec at admission and discharge for patients aged 80 and older, showed significant decreases in hospital visits (both ED visits and readmissions) in a 12 month follow up period\textsuperscript{34}.

A study of ambulatory-based pharmacist post-discharge medication therapy assessment and reconciliation found a significant decrease in patients’ 7–day re-admission rates as compared to controls\textsuperscript{35}.

The role of the pharmacy technician in the MedRec process can be beneficial for an organization. Pharmacy technicians are being utilized increasingly in hospitals to assist with MedRec-related tasks including creation of a BPMH.

To read more on this:

- TechTalk lesson: MedRec Pharmacy Techs
- Facilitating MedRec in the ER department: A tale of two cities (Pharmacy student and Pharmacy technician models)

Key Points

- MedRec is a process that can help decrease adverse drug events.
- The BPMH is the cornerstone to MedRec.
- A BPMH is obtained using a systematic approach and includes a patient interview whenever possible and at least one other reliable source of information.
- Discharge MedRec involves effectively communicating with patients/families/caregivers and healthcare providers assuming the patient’s care
- MedRec often involves many care providers. Patients and pharmacy staff can play an important role in preventing adverse drug events at transitions of care.

Discussion Forum

1. How do you feel MedRec can enhance collaboration between community and hospital pharmacists?
2. Do you have any tools and tips that you utilize to ensure your best possible medication history is complete?
3. Where do you feel are the biggest gaps in the MedRec process and how do you feel they should be addressed?
Resources
For healthcare providers

- **ISMP Canada** is an independent national not-for-profit organization committed to the advancement of medication safety in all healthcare settings.
- **CPSI** is a not-for-profit organization that exists to raise awareness and facilitate implementation of ideas.
- **Hospital to Home: Facilitating Medication Safety at Transitions** a Toolkit and Checklist for Healthcare Providers
- **ISMP Canada BPMH Training Workshops** for technicians, nurses, clinical staff and allied health
- **Getting Started Kits:**
  - Acute Care Getting Started Kit ([English](English)) ([Français](Français))
  - Long-Term Care Getting Started Kit ([English](English)) ([Français](Français))
  - Home Care Getting Started Kit ([English](English)) ([Français](Français))
  - Ontario Primary Care Medication Reconciliation Guide ([English](English)) ([Français](Français))
  - Paper to Electronic MedRec Implementation Toolkit ([English](English)) ([Français](Français))

To download the joint American Society of Health System Pharmacy and American Pharmacist Association’s documents:

- “Medication Management in Care Transition Best Practices”
- “Improving Care Transitions: Optimizing Medication Reconciliation”

For patients/consumers

- **SafeMedicationUse.ca**
- 5 Questions to Ask about your Medications
- When It Comes to Your Medicines, Don't Rely on Memory!
- Keep a List of Your Medications
- MedRec Can Help to Reduce the Chance of Errors with Medicines!
- Minerals May Interact with Some Medicines Don't Forget — Keep a List of Your Medicines!
Post-Test

1. Complete the following sentence: Medication reconciliation is...
   a. a medication history created using a systematic process of interviewing the patient and/or family
   b. the completion of the MedRec form
   c. a formal process to ensure accurate medication information is communicated effectively across transitions of care.
   d. a formal process to ensure accurate medical information is communicated to the patient and across transitions of care.

2. A Best Possible Medication History is intended to capture a patient’s actual medication use.
   a. True
   b. False

3. Which of the following is true regarding how to take a Best Possible Medication History (BPMH)?
   a. Uses one reliable source of information
   b. Utilizes a systematic process
   c. Reflects only prescription medications
   d. Uses at least one other reliable source of information
   e. Reflects actual medications used
   f. A and B
   g. B and D
   h. B, C and D
   i. B, D and E
   j. A, B and E

4. Admission MedRec based in acute/long-term care is:
   a. A multi-step process
   b. Includes the creation of a BPMH
   c. Includes the identification and resolution of discrepancies
   d. All of the above
   e. B and C only

5. The discharge MedRec process compares discharge medication orders and current medications to the BPMH.
   a. True
   b. False

6. Goals of discharge MedRec among others include:
a. Resolving all drug-related problems
b. Communicating a medication discharge plan to the patient
c. Communicating a medication discharge plan to relevant care providers
d. All of the above
e. B and C

7. MedRec has been shown to decrease all of the following except:
   a. Adverse drug events
   b. Clinician re-work
   c. Adverse drug reactions

8. Which of the following is NOT usually included on the Best Possible Medication Discharge Plan (BPMDP):
   a. New medications started in hospital
   b. Medications that were stopped
   c. Changed medications
   d. Recent blood work results and consult/discharge notes
   e. Unchanged medications

9. Drug Information Systems that contain a record of medications dispensed in community pharmacy settings are available in each province or territory.
   a. True
   b. False

10. The inadvertent omission from hospital admission orders of a medication that was documented in a BPMH is an example of:
    a. A potential adverse drug event
    b. An unintentional discrepancy
    c. An undocumented intentional discrepancy
    d. A and B
    e. A and C
    f. B and C
References


18 Rozich JD, Howard RJ, Justeson JM, Macken PD, Lindsay ME, Resar RK. Standardization as a mechanism to improve safety in health care: impact of sliding scale insulin protocol and reconciliation of medications initiatives. J Qual Saf. 2004;30(1):5-14


31 ISMP Canada website https://www.ismp-canada.org/medrec/5questions.htm


34 Ulrika Gillespie, MSc Pharm; Anna Alassaad, MSc Pharm; Dan Henrohn, MD, MSc, Pharm; Hans Garmo, PhD; Margareta Hammarlund-Udenaes, PhD; Henrik Toss, MD, PhD; Åsa Kettis-Lindblad, PhD; Håkan Melhus, MD, PhD; Claes Mörlin, MD, PhD A Comprehensive Pharmacist Intervention to Reduce Morbidity in Patients 80 Years or Older A Randomized Controlled Trial Arch Intern Med. 2009;169(9):894-900.

35 Meg Kilcup, PharmD; Diane Schultz, BSPharm, CPPS; Jim Carlson, PharmD; Bruce Wilson, MD Postdischarge pharmacist medication reconciliation: Impact on readmission rates and financial savings J Am Pharm Assoc (2003) 2013;53:78-84.