

20th Annual ASHP Conference for Pharmacy Leaders  
Implementing a Proven Program to Take the Best Possible Medication History:  
How to Run “Medication Reconciliation Practitioner (MRP) University” at Your Institution – Part 1



**Implementing a Proven Program to Take the Best Possible Medication History:  
How to Run “Medication Reconciliation Practitioner (MRP) University” at Your Institution – Part 1**

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## Objectives

- ❖ Define medication reconciliation and articulate the importance of performing an accurate medication history as a key component of medication safety
- ❖ Explain the steps for conducting and completing a best-possible medication history (BPMH) and the process for verifying its accuracy
- ❖ Demonstrate key BPMH competencies and evaluate trainees’ ability to demonstrate these competencies
- ❖ Demonstrate how key skills taught during the workshop may be taught to others locally to train them to take a BPMH and certify their competency
- ❖ Identify and demonstrate the appropriate mechanisms for providing feedback to trainees to facilitate improvement in their ability to conduct a BPMH



## Day 1 Learning Objectives: Essentials of Taking the BPMH

Workshop attendees will participate as student learners

- ❖ Articulate the core definition of medication reconciliation and its role in good patient care.
- ❖ Outline the core components of conducting a BPMH.
- ❖ Evaluate common gaps in practice and competencies for performing a BPMH.
- ❖ Develop a plan to address barriers to conducting the BPMH.
- ❖ Demonstrate competency in taking a BPMH, including creation of an accurate medication list and demonstration of recommended behaviors.



## Agenda

- ❖ Why medication reconciliation and history-taking are important
- ❖ How to take a best-possible medication history
- ❖ Small-group simulations
  - Debrief
- ❖ Wrap-up and introduction to Day 2



## Introduction: Why Medication Reconciliation and the Medication History are Important



## Case 1 - History of Present Illness

- ❖ 60-year-old female with non-ischemic cardiomyopathy and progressive biventricular heart failure is admitted for management of acute-on-chronic systolic heart failure and possible heart transplant
- ❖ Scheduled admission to CHF service
  - Overflow to general cardiology service
  - Late admission to a busy long-call team



### Case 1 – Past Medical History

- ❖ Hypertension
- ❖ Hyperlipidemia
- ❖ Diabetes mellitus type II
- ❖ Hypothyroidism
- ❖ Non-ischemic CMP (EF 20-30%)
  - Severe MR
  - Moderate AS
  - Moderate to Severe TR
  - Severe pulmonary hypertension
  - RV dysfunction



### Case 1 – Preadmission Medications

- ❖ Losartan 50 mg PO daily
- ❖ Spironolactone 25 mg PO daily
- ❖ ASA 81 mg PO daily
- ❖ Furosemide 80 mg PO BID
- ❖ Digoxin 0.25 mg PO daily
- ❖ Carvedilol 6.25 mg PO BID
- ❖ Pravastatin 40 mg PO daily
- ❖ Omeprazole 40 mg PO daily
- ❖ Saxagliptin/Metformin 5 mg /1000 mg PO daily
- ❖ **Levothyroxine 25 mcg PO daily**



### Case 1 – Medication History-Taking

- ❖ During admission history and physical exam, patient provided **handwritten** list of home medications which included “**levothyroxine 25 mg**” to the admitting intern
- ❖ Due to busy admitting day, team resident used list to fill out Pre-Admission Medication List (PAML)
- ❖ During PAML creation, resident noted levothyroxine units and converted dose to **250 mcg daily**. Correct conversion would be **25,000 mcg daily**.
- ❖ Because patient was new to Partners there were no medications from electronic sources to help generate PAML



### Case 1 – Hospital Course

- ❖ Intern, fellow, and attending admission notes all report home levothyroxine dose as 250 mcg
- ❖ On HD#2, PAML is reviewed by pharmacist who reconciles admissions orders with PAML – this does not include independent verification of preadmission medications
- ❖ On HD#3, transplant pharmacist reviews preadmission medications with patient, who verbally confirms erroneous dose
- ❖ Patient continues to receive 250 mcg of levothyroxine daily for the next 20 days



### Case 1 – Hospital Course

- ❖ Patient listed for heart transplant
- ❖ PA catheter placed for directed therapy with inotropic agents and diuretics
- ❖ HD#18 patient develops fevers and hypotension. Patient is started on antibiotics given concern for mixed septic and cardiogenic shock
- ❖ HD#20 patient is transferred to CCU given refractory hypotension
- ❖ Taken to cath lab urgently for placement of intra-aortic balloon pump



### Case 1 – Hospital Course

- ❖ **TSH: 0.153 mIU/L** (admission 3.95)
- ❖ **Free T4: 3.8 ng/dL** (nl 0.9-1.7)



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### Case 1 – Hospital Course

- ❖ Endocrinology consulted and felt that decompensation consistent with thyrotoxicosis
- ❖ On detailed review with patient, she reported taking “oval, salmon colored pill” which is consistent with 25 mcg levothyroxine
- ❖ Outpatient pharmacy confirmed dose of 25 mcg levothyroxine for > 1 year
- ❖ Levothyroxine discontinued



### A Good Medication History Is Critical for Patient Safety

- ❖ Adverse drug events
  - Definition: injury due to a medication
  - Affect ~10% of patients during hospitalization
  - Affect ~15% of patients after hospital discharge
- ❖ Errors in the medication history
  - Account for up to 75% of all potentially harmful medication discrepancies in admission and discharge orders



### Baseline Results from MARQUIS

| Discrepancy type                                   | All sites (n=488) | Range          |
|--|-------------------|----------------|
| <b>Total discrepancies per patient (all types)</b> | <b>3.3</b>        | <b>2.0-4.5</b> |
| Admission  | 1.6               | 0.9-2.4        |
| Discharge  | 1.7               | 1.1-2.1        |
| <b>History discrepancies</b>                       | <b>1.6</b>        | <b>0.4-3.1</b> |
| Admission  | 0.7               | 0.3-1.3        |
| Discharge  | 0.9               | 0.4-1.8        |
| <b>Reconciliation discrepancies</b>                | <b>1.7</b>        | <b>0.3-2.6</b> |
| Admission  | 0.9               | 0.1-1.5        |
| Discharge  | 0.8               | 0.3-1.9        |

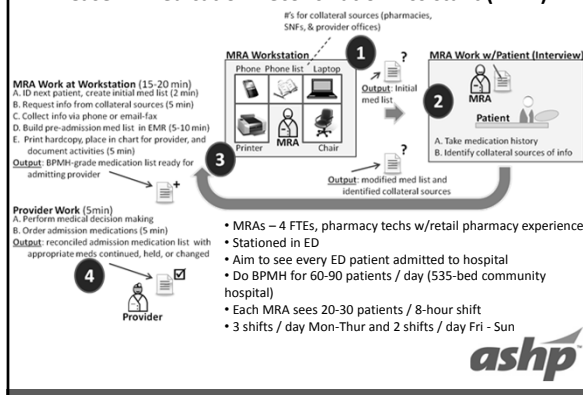


### MARQUIS Adjudicated Results

| All medications                          | All sites (N=488) | Range            |
|--|-------------------|------------------|
| <b>Potentially harmful discrepancies</b> | <b>0.34</b>       | <b>0.20-0.60</b> |
| Admission                                | 0.10              | 0.03-0.14        |
| Discharge                                | 0.24              | 0.11-0.47        |
| <b>History Discrepancies</b>             | <b>0.10</b>       | <b>0.01-0.14</b> |
| <b>Reconciliation Discrepancies</b>      | <b>0.24</b>       | <b>0.07-0.58</b> |
| Potential severity: admission            |                   |                  |
| Significant                              | 0.08              | 0.03-0.11        |
| Serious                                  | 0.02              | 0-0.08           |
| Potential severity: discharge            |                   |                  |
| Significant                              | 0.18              | 0.05-0.28        |
| Serious                                  | 0.07              | 0.01-0.09        |



### Case 1: Medication Reconciliation Assistant (MRA)



### Case 1 - Barriers

- ❖ Available, competent BPMH-takers
  - Who will perform BPMH for the 2-8 patients/day on intervention unit who bypassed the ED’s MRA program?
  - How do you ensure BPMH competence for these people?
- ❖ Scrap & re-work (gold vs. garbage conundrum)
  - How does discharging provider discern if admission medication list is the product of a BPMH, i.e. gold?
  - Or the opposite, i.e. garbage?
  - Not knowing means a diligent provider must do a BPMH at the time of discharge (scrap & re-work = waste)



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### Case 1 - Barriers

- ❖ Role clarity: who does what and when?
- ❖ Competency training: how do we train the right people for their roles, e.g., taking a BPMH
- ❖ Ongoing competency training: how do you reach new hires?



### Case 1 – Lessons

- ❖ We can determine oversights in real-time
  - MARQUIS pharmacist can generate list of:
  - High risk patients
  - Patients who still need BPMH (i.e. not seen by MRA in ED)
- ❖ We can determine needs so we can recommend rational resource allocation to leadership
  - 4-8 patients / day on intervention unit still need a BPMH
  - We know who these patients are, so could address in real-time

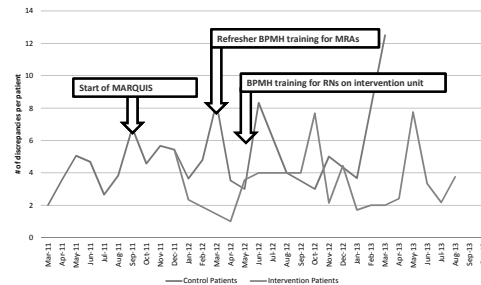


### Case 1 – Lessons (cont’d.)

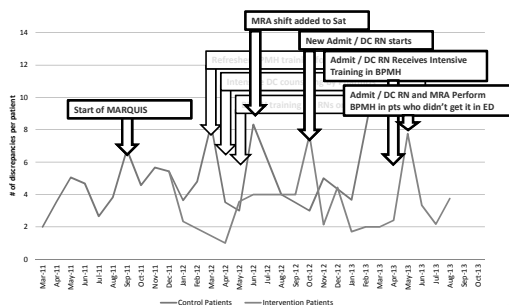
- ❖ Addressing issues of training and competency assessment: Created simulation-based training
  - Role-play by instructor with script
  - Access to sources of medication information when asked
  - Checklist of desired behaviors
  - Gold-standard medication list when completed
- ❖ Need for documentation of quality of and sources used to create medication history



### Case 1: Preliminary Results



### Case 1: Preliminary Results



### Preliminary Results

| Unintentional Discrepancies                    | Pre-Intervention (N=126) | Concurrent Control (N=119) | Intervention (N=127) | P Value* |
|--|--------------------------|----------------------------|----------------------|----------|
| Total per patient                              | 4.5                      | 5.2                        | 3.4                  | <0.001   |
| Due to history errors                          | 3.1                      | 4.0                        | 2.6                  | 0.002    |
| Due to reconciliation errors                   | 1.4                      | 1.2                        | 0.8                  | 0.02     |
| <b>Total Potentially harmful discrepancies</b> |                          |                            |                      |          |
| Total per patient                              | 0.25                     | 0.32                       | 0.09                 | 0.003    |
| Due to history errors                          | 0.13                     | 0.29                       | 0.06                 | 0.004    |
| Due to reconciliation errors                   | 0.12                     | 0.03                       | 0.02                 | 0.19     |

\* Intervention compared with both controls combined



**1. If you already have a home medication list on a patient being admitted to the hospital, you should:**

- A. Assume it's correct if less than a month old
- B. Read the medications and ask the patient to verify them one at a time
- C. Have the patient tell you what medications they are taking first
- D. None of the above

|   |    |
|---|----|
| Assume it's correct if less than a month old                          | 0% |
| Read the medications and ask the patient to verify them one at a time | 0% |
| Have the patient tell you what medications they are taking first      | 0% |
| None of the above   | 0% |

**1. If you already have a home medication list on a patient being admitted to the hospital, you should:**

- A. Assume it's correct if less than a month old
- B. Read the medications and ask the patient to verify them one at a time
- C. Have the patient tell you what medications they are taking first
- D. None of the above

**2. Medications that patients might otherwise forget to tell you unless prompted include:**

- A. Non-oral medications
- B. Non-prescription medications
- C. Weekly or monthly medications
- D. PRN medications
- E. A and C
- F. All of the above

|                               |    |
|-------------------------------|----|
| Non-oral medications          | 0% |
| Non-prescription medications  | 0% |
| Weekly or monthly medications | 0% |
| PRN medications               | 0% |
| A and C                       | 0% |
| All of the above              | 0% |

**2. Medications that patients might otherwise forget to tell you unless prompted include:**

- A. Non-oral medications
- B. Non-prescription medications
- C. Weekly or monthly medications
- D. PRN medications
- E. A and C
- F. All of the above

**3. There is no easy way to figure out what a medication is just by the pill's appearance:**

- A. True
- B. False

|       |    |
|-------|----|
| True  | 0% |
| False | 0% |

**3. There is no easy way to figure out what a medication is just by the pill's appearance:**

- A. True
- B. False

**4. What is the minimum number of medication sources you need to feel confident in the accuracy of a home medication list?**

A. One  
 B. Two  
 C. Three  
 D. Four

| Option | Percentage |
|--------|------------|
| One    | 0%         |
| Two    | 0%         |
| Three  | 0%         |
| Four   | 0%         |

**4. What is the minimum number of medication sources you need to feel confident in the accuracy of a home medication list?**

A. One  
 B. Two  
 C. Three  
 D. Four

**5. Which of the following would not be considered an "objective" source of medication information?**

A. An ambulatory EMR list  
 B. The patient's own medication list  
 C. The patient's spouse's memory  
 D. The patient's medication bottles  
 E. None of the above are "objective"

| Option                            | Percentage |
|-----------------------------------|------------|
| An ambulatory EMR list            | 0%         |
| The patient's own medication list | 0%         |
| The patient's spouse's memory     | 0%         |
| The patient's medication bottles  | 0%         |
| None of the above are "objective" | 0%         |

**5. Which of the following would not be considered an "objective" source of medication information?**

A. An ambulatory EMR list  
 B. The patient's own medication list  
 C. The patient's spouse's memory  
 D. The patient's medication bottles  
 E. None of the above are "objective"

**6. Your patient has a medication list and you have one as well (from the outpatient EMR). The two sources agree and the patient seems knowledgeable about his medications. A reasonable next step is to:**

A. Be done taking the medication history  
 B. Gather a third source just to make sure  
 C. Talk to the patient's PCP  
 D. D. None of the above

| Option                                  | Percentage |
|---|------------|
| Be done taking the medication history   | 0%         |
| Gather a third source just to make sure | 0%         |
| Talk to the patient's PCP               | 0%         |
| D. None of the above                    | 0%         |

**6. Your patient has a medication list and you have one as well (from the outpatient EMR). The two sources agree and the patient seems knowledgeable about his medications. A reasonable next step is to:**

A. Be done taking the medication history  
 B. Gather a third source just to make sure  
 C. Talk to the patient's PCP  
 D. D. None of the above

**7. When taking a BPMH, the history taker should ask about:**

- A. Medication adherence
- B. Medication side-effects
- C. The last time medications were taken
- D. All pharmacies where prescriptions are filled
- E. A and D
- F. All of the above

**7. When taking a BPMH, the history taker should ask about:**

- A. Medication adherence
- B. Medication side-effects
- C. The last time medications were taken
- D. All pharmacies where prescriptions are filled
- E. A and D
- F. All of the above

**8. If a patient cannot provide a medication list, cannot recall medications from memory, and cannot resolve discrepancies between lists, the following sources should be utilized:**

- A. PCP's office
- B. Community pharmacy
- C. Family members or other caregivers
- D. Recent discharge summary
- E. All of the above

**8. If a patient cannot provide a medication list, cannot recall medications from memory, and cannot resolve discrepancies between lists, the following sources should be utilized:**

- A. PCP's office
- B. Community pharmacy
- C. Family members or other caregivers
- D. Recent discharge summary
- E. All of the above

**Role Play**

- ❖ I'll play the role of the patient
  - John Doe, 68-year-old male with CAD, admitted for crescendo angina
  - HPI:
    - Dx'd with CAD 1 year prior, stent placed
    - Chest pain started 2 months ago, occurring more frequently in past week (3-4 times a day), requiring more NTG for pain relief
    - 4 AM day of admission, had more intense CP, minimally improved with 3 NTG. +SOB, sweats. Called PCP → ED

**Patient Medical History**

- ❖ Coronary artery disease (CAD), 1 stent placed in 2013
- ❖ Hypertension
- ❖ Gout
- ❖ Diabetes
- ❖ Asthma

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**Role Play**

- ❖ Interview the patient regarding his medications
- ❖ “Think aloud” as you go through the process
- ❖ “Access” sources of medication data before or after seeing the patient as you normally would. You can ask for additional sources of data, then I will provide those sources if asked.
- ❖ At the end, you should compile and record the best possible medication list.



**John Doe’s Discharge Orders/Instructions - From BWH admission 6 months prior to current admission**

- ❖ Coumadin (Warfarin Sodium) 7.5 mg PO QPM
- ❖ Allopurinol 50 mg PO Daily
- ❖ Enteric Coated ASA 325 mg PO Daily
- ❖ Plavix (Clopidogrel) 75 mg PO Daily
- ❖ Colchicine 0.6 mg PO BID
- ❖ Glyburide 1.25 mg PO BID
- ❖ Imdur ER (Isosorbide mononitrate [SR]) 30 mg PO Daily
- ❖ Metoprolol Succinate Extended Release 50 mg PO Daily
- ❖ Zocor (Simvastatin) 80 mg PO Bedtime



**John Doe’s Pharmacy Medication List**

Allopurinol 100 mg p.o. Daily (2 50 mg tabs)  
 Clopidogrel 75 mg p.o. Daily  
 Colchicine 0.6 mg p.o. b.i.d.  
 Glyburide 1.25 mg p.o. b.i.d.  
 Imdur 30 mg p.o. q.d. – Has not picked up his Imdur 30 mg p.o. Daily since 3 months + 10 days, though it was a 90-day supply  
 Metoprolol XL 50 mg p.o. Daily  
 Simvastatin 80 mg p.o. qhs  
 Warfarin 5 mg p.o. qPM  
 Amiloride 5 mg p.o. b.i.d. (last filled one month ago #120 tabs)  
 Enalapril 20 mg b.i.d. (last filled 3 months ago #180 tabs – 3-month supply per Walmart)  
 Nitro 0.4 mg SL p.r.n. chest pain as instructed  
 Albuterol inhaler p.r.n. shortness of breath as instructed  
 Advair 250/50 mg 1 puff b.i.d. – script that he has never picked up/filled



**John Doe’s Pharmacy Medication List — PCPs Office**

Allopurinol 100 mg p.o. Daily  
 Aspirin 162.5 mg p.o. Daily  
 Clopidogrel 75 mg p.o. Daily  
 Colchicine 0.6 mg p.o. b.i.d.  
 Glyburide 1.25 mg p.o. b.i.d.  
 Imdur 30 mg p.o. Daily  
 Metoprolol XL 50 mg p.o. Daily  
 Simvastatin 80 mg p.o. qhs  
 Warfarin 5 mg p.o. qPM  
 Amiloride 5 mg p.o. b.i.d.  
 Enalapril 20 mg b.i.d.  
 Tylenol Arthritis (650 mg) 4-6 tabs per day p.r.n. knee pain  
 Nitro 0.4 mg SL p.r.n. chest pain as instructed  
 Albuterol inhaler p.r.n. shortness of breath as instructed  
 Advair 250/50mg 1 puff b.i.d.



Note: these medications are not in their bottles; the clinician should identify pills using an appropriate source, such as Drugs.com

| Morning Ziplock:  | Afternoon Ziplock:                  | PM Ziplock:  | Also has:  |
|---|-------------------------------------|--|--|
| Allopurinol 50 mg, 2 tablets: takes 1 or 2 a day depending on whether he has gout | Tylenol Arthritis 650 mg, 2 tablets | Colchicine 0.6 mg tablet<br>Glyburide 1.25 mg tablet<br>Simvastatin 80 mg tablet<br>Warfarin 5 mg tablet<br>Amiloride 5 mg tablet<br>Enalapril 20 mg tablet<br>Tylenol Arthritis 650 mg, 2 tablets | Nitroglycerin bottle of 0.4 mg tablets – usually takes 1 daily or every other day, more recently<br>Albuterol inhaler, p.r.n. Does not use often.<br><b>Does NOT have:</b><br>Imdur<br>Advair discus |



**John Doe’s Pre-admission Medication List – Gold Standard “Answer Key”**

Allopurinol 50-100 mg p.o. q.d. – (1-2 50 mg tabs.) – The patient states that he takes 1 or 2 tabs depending on if he has gout pain or not.  
 Aspirin 162.5 mg p.o. q.d. Dr. Weiser told him he should take 1/2 an adult aspirin per day instead of the full 325 mg q.d.  
 Clopidogrel 75 mg p.o. q.d.  
 Colchicine 0.6 mg p.o. b.i.d.  
 Glyburide 1.25 mg p.o. b.i.d.  
 Imdur 30 mg p.o. q.d. – Has not picked up his Imdur 30 mg p.o. q.d. since 100 days ago – though it was a 90-day supply per Walmart. He does not remember if he has been taking this at home or not. (He has not) – would need new script. Might explain why he’s been having more chest pain lately.  
 Metoprolol XL 50 mg p.o. q.d.  
 Simvastatin 80 mg p.o. qhs  
 Warfarin 5 mg p.o. qPM, or per warfarin clinic  
 Amiloride 5 mg p.o. b.i.d. (last filled 2 weeks PTA #120 tabs per Walmart)  
 Enalapril 20 mg b.i.d. (last filled 3 months PTA #180 tabs – 3-month supply per Walmart) – he is taking it  
 Tylenol Arthritis (650 mg) 4-6 tabs per day p.r.n. for his knees  
 Nitro 0.4 mg SL p.r.n. 0 uses 1 or 2 almost q.d. or q.o.d. at home per himself  
 Albuterol inhaler for p.r.n. use – does not use often  
 Advair 250/50 mg 1 puff b.i.d. script that he has never filled






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| High-Performance Behaviors   |                          |
|--|--------------------------|
| Asks the patient open-ended questions about what medications she or he is taking (i.e., doesn't read the list and ask if it is correct)  | <input type="checkbox"/> |
| Uses probing questions to elicit additional information: non-oral meds, non-daily meds, PRN medications, non-prescription meds   | <input type="checkbox"/> |
| Uses other probes to elicit additional medications: common reasons for PRNs, meds for problems in the problem list, meds prescribed by specialists   | <input type="checkbox"/> |
| Asks about adherence   | <input type="checkbox"/> |
| Uses at least two sources of medications, ideally one provided by the patient and one from another "objective" source (e.g., patient's own list and ambulatory EMR med list)   | <input type="checkbox"/> |
| Knows when to stop getting additional sources (e.g., if patient has a list or pill bottles and seems completely reliable and data are not that dissimilar from the other sources, and/or the differences can be explained)                               | <input type="checkbox"/> |
| Knows when to get additional sources if available (e.g., if patient is not sure, relying on memory only or cannot resolve discrepancies among the various sources of medication information)   | <input type="checkbox"/> |
| When additional sources are needed, uses available sources first (e.g., pill bottles present). Then obtains pharmacy data. If the medication history is still not clear: obtains outpatient provider lists, pill bottles from home and/or other sources. | <input type="checkbox"/> |
| Uses resources like Drugs.com to identify loose medications (i.e., for a bag of medications, not in their bottles, provided by a patient)  | <input type="checkbox"/> |
| Returns to patient to review new information, resolve all remaining discrepancies  | <input type="checkbox"/> |
| Gets help from other team members when needed  | <input type="checkbox"/> |
| Educates the patient and/or caregiver of the importance of carrying an accurate and up to date medication list with them   | <input type="checkbox"/> |

## How to Take the Best Possible Medication History (BPMH)




### Goals of a Good Medication History

- ❖ To obtain complete information on the patient's regimen, including the:
  - Name of each medication
  - Formulation (e.g., extended release)
  - Dosage
  - Route
  - Frequency
- ❖ To distinguish between what patients are supposed to be on vs. what they actually take




### History Also Ideally Includes

- ❖ Drug indications
- ❖ Any recent changes in the regimen
- ❖ Over-the-counter drugs
- ❖ Sample medications
- ❖ Vitamins, herbals, nutraceuticals, supplements
- ❖ When the patient last took each medication
- ❖ Allergies and the associated reactions
- ❖ Prescriber(s)
- ❖ Pharmacy(ies)




### It's Not Easy!

- ❖ Many health care professionals not trained to take a good medication history
- ❖ Patients may be unfamiliar with their meds
- ❖ Available information may be incomplete, out of date, or conflicting
- ❖ Errors are common
  - Examples: omitting a medication, additional medication, wrong dosage or frequency
- ❖ Can be time consuming
  - But training makes the process better and faster



### Tips on Taking a Good History

- ❖ Try to use at least **two sources** of information when possible and explore discrepancies between them
  - Source #1 = from patient
    - Patient (from interview)
    - Patient-owned medication lists
    - Family members and other caregivers
    - Pill bottles
  - Source #2 = from elsewhere
    - Discharge medication orders from recent hospitalizations
    - Medication lists and/or notes from outpatient providers
    - Transfer orders from other facilities
    - Pharmacy(ies) where patient fills prescriptions



### Using a Medication List

- ❖ Can save time and reduce errors in the medication history
- ❖ List may not be current or accurate
- ❖ Review and verify list with the patient
  - Don't just read the list and ask patient if it is ok!
  - **Ask patient to tell you what they are taking, how much, and how often**
  - Then use list to explore discrepancies and confirm
  - Probe to identify additional medications



### How to Probe for Information

- ❖ Begin with an open ended question
  - *What medicines do you take?*
- ❖ Ask about scheduled medications
  - *Which medicines do you take everyday, regardless of how you feel?*
- ❖ Ask about prn medications
  - *Which medicines do you take only sometimes?*
  - *Do you often take something for headaches? Allergies? To help you fall asleep? When you get a cold? For heartburn?*



### Medication History Probes

- ❖ Fill in gaps
  - For each medication, elicit dose and time(s) of day the patient takes it, if not already provided
  - Ask about extended-release forms and route
- ❖ Assess the purpose of each medication
  - *What is that medicine for? Do you take anything else for that?*
- ❖ Ask about meds for specific conditions
  - *What medicines do you take for your diabetes, high blood pressure, etc.?*



### Medication History Probes

- ❖ Ask about medications that are easy to forget
  - *Do you take any inhalers, nebulizers, nasal sprays, ointments, creams, eye drops, ear drops, patches, injections, or suppositories?*
  - *Do you take any medicines in the evening or night?*
  - *Do you take any medicines weekly or monthly?*
- ❖ Ask about non-prescription products
  - *Which medicines do you take that don't require a prescription? Any over-the-counter medicines, vitamins, herbals, supplements?*



### Medication History Probes

- ❖ Assess when was the last dose of each med
  - *When did you take the last dose of your [warfarin, blood pressure medicine, insulin]?*
- ❖ Ask about adherence
  - *Many patients don't take their medicines exactly as they should every day. In the last week, how many days have you missed a dose of one of your medicines?*



### Time-Saving Tips

- ❖ Start with easily accessible sources
  - Medication list from outpatient medical record
  - Recent hospital discharge summary
  - Prescription fill information from patient's local pharmacy or national database if available
  - Patient's home medication list
  - Patient's pill bottles if available
- ❖ You can finish quickly if
  - Your list agrees with patient's list or bottles, or
  - Patient is reliable and can explain differences



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### When to Gather Additional Data

- ❖ Patient is unsure about medication names, doses, and indications
- ❖ Patient cannot explain discrepancies in lists
- ❖ Patient doesn't have a list and can't provide medication information from memory
- ❖ Sources of information not updated recently
- ❖ The missing information is potentially dangerous



### Gathering Additional Data

- ❖ Contact outpatient pharmacies or access database of pharmacy information (if not already done)
- ❖ Contact outpatient providers
- ❖ Have patient's family bring in the pill bottles from home
- ❖ Resolve as many discrepancies as you can, the return to the patient with directed questions to complete the list
- ❖ If needed, get help from a pharmacist



### Videos

- ❖ Taking an accurate history when a medication list is available (7:40)
- ❖ Taking an accurate history without a medication list (10:30)
- ❖ <https://www.youtube.com/watch?t=11&v=lt8KfitBeeE>



### Other Techniques You Can Use

- ❖ Use a pill identifier to help patients recognize their medicines (e.g., Drugs.com)



Images for 9 3 5510 (Mercaptopurine 50 mg)

**Mercaptopurine**

Imprint: 9 3 5510  
 Strength: 50 mg  
 Color: Yellow  
 Size: 9.00 mm  
 Shape: Round  
 Availability: Prescription if only  
 Drug Class: Antimetabolites  
 Pregnancy Category: D - Positive evidence of risk  
 CSA Schedule: II - Not a controlled drug  
 Manufacturer: Teva Pharmaceuticals USA  
 National Drug Code (NDC): 00093-5510  
 Inactive Ingredients: corn starch, potato starch, lactose, magnesium stearate, croscarmellose, polyethylene glycol

View Details Print Page

### BPMH Tri-Fold Pocket Cards

**EMARQUIS** Best Possible Medication History (BPMH) Quick Tip

**Time-saving tip:** If you start with a medication list, review and only add medications with the patient. If you start with a list of medications, ask the patient to confirm or deny each medication. If you start with a list of medications, ask the patient to confirm or deny each medication. If you start with a list of medications, ask the patient to confirm or deny each medication.

**Probing Questions:**

- Ask about medications that are easy to forget.
- Do you take any vitamins, calcium, or supplements?
- Do you take any medications in the month or so before?
- Do you take any medications once a week or once a month?
- What about over-the-counter products, like Tylenol?
- What about injections or infusions that you might not remember?
- Do you have any other medications that you are not sure about?
- Do you have any other medications that you are not sure about?
- Do you have any other medications that you are not sure about?

**Assessing the progress of each medication may need to be additional questions:**

- What each medication is for?
- Do you take any other medications?
- Do you take any other medications?
- Do you take any other medications?


**Ask about medications prescribed by other providers:**

- Do you have any other medications that you are not sure about?
- Do you have any other medications that you are not sure about?
- Do you have any other medications that you are not sure about?

**EMARQUIS** Best Possible Medication History (BPMH) Quick Tip

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## Other Resources from MARQUIS



## MARQUIS Toolkit\*

- ❖ A compilation of the "best practices" around medication reconciliation, with resources to support deployment of the intervention components
  - MARQUIS Implementation Manual
  - Best Possible Medication History (BPMH) Pocket Cards
  - Taking a Good Medication History Video
  - Good Discharge Counseling Video
  - ROI Calculator

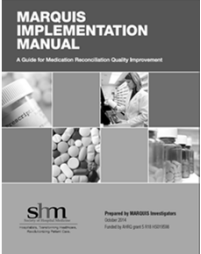
\*All available for download at [www.hospitalmedicine.org/marquis](http://www.hospitalmedicine.org/marquis)

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## MARQUIS Implementation Manual

- ❖ Summarizes best practices in medication reconciliation
- ❖ Many great tools and examples!
- ❖ Intended to be adapted for local use
- ❖ Explains QI fundamentals and how they can be applied to medication reconciliation efforts



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## Risk Stratification Tool

| High-Risk Patient   | Low- to Intermediate-Risk |
|---|---------------------------|
| A. Physician concern about patient and medications on admission ("gut check")<br><br>OR<br><br>B. At least 2 of the following:<br>1. Patient/caregiver cannot provide medication list or pill bottles<br>2. > 10 pre-admission medications<br>3. > 3 high risk medications:<br>- Anticoagulants<br>- <u>Antiplatelets</u><br>- Insulin<br>- Oral <u>hypoglycemics</u><br>- Opioids<br>- Digoxin | All other patients        |

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## Patient-Centered Medication Lists

-AARP

**My Personal Medication Record**

| My Personal Information                  | What I'm taking   | Form (pill, patch, etc.) | Dosage | How Much and When | Use (frequency or occasion) | Start/Stop Dates (YYYY-MM-DD) | Notes, Directions, Reasons for Use |
|--|---|--------------------------|--------|-------------------|-----------------------------|-------------------------------|------------------------------------|
| Name _____                               | - Be sure to include ALL prescription drugs over the counter drugs, vitamins and herbal supplements |                          |        |                   |                             |                               |                                    |
| Date of Birth _____                      | 1   |                          |        |                   |                             |                               |                                    |
| Phone Number _____                       | 2   |                          |        |                   |                             |                               |                                    |
| Relationship _____                       | 3   |                          |        |                   |                             |                               |                                    |
| Primary Care Physician Name _____        | 4   |                          |        |                   |                             |                               |                                    |
| Phone Number _____                       | 5   |                          |        |                   |                             |                               |                                    |
| Pharmacy/Drugsite Name _____             | 6   |                          |        |                   |                             |                               |                                    |
| Phone Number _____                       | 7   |                          |        |                   |                             |                               |                                    |
| Other Physicians Name of Physician _____ | 8   |                          |        |                   |                             |                               |                                    |
| Specialty _____                          | 9   |                          |        |                   |                             |                               |                                    |
| Phone Number _____                       | 10  |                          |        |                   |                             |                               |                                    |
| Name of Physician _____                  | 11  |                          |        |                   |                             |                               |                                    |
| Specialty _____                          | 12  |                          |        |                   |                             |                               |                                    |
| Phone Number _____                       |   |                          |        |                   |                             |                               |                                    |

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### Sample Social Marketing Tools

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### ROI Calculator

ROI Analysis to Perform Medication Reconciliation Upon Patient Hospital Admission  
 Based on Inpatient ADE Reduction  
 Return on Investment (ROI) Analysis

| Assumption   | Value       |
|--|-------------|
| Average number of unintentional medication discrepancies in admission orders per patient based on MARQUIS Study                          | 2.0         |
| Number of inpatient admissions per year  | 35,000      |
| Potential medication errors per year that can be avoided with improved pharm   | 70,000      |
| % of avoided medication errors that would be harmful to the patient <sup>a</sup>   | 0.90%       |
| % of errors that can be prevented by pharmacists   | 75%         |
| Total avoided harmful medication errors per year   | 473         |
| Cost of harmful medication error to hospital <sup>b</sup>  | \$4,655     |
| Annual savings to hospital as a result of avoided harmful medication errors  | \$2,199,488 |
| Time (in minutes) required per admission for pharmacist to complete a medication admission history and perform medication reconciliation | 21          |
| Pharmacist hours required per year to perform medication reconciliation  | 12,250      |
| Pharmacist FTE required per year to perform medication reconciliation  | 5.9         |
| Pharmacist FTE needed to add to budget to staff FTEs (benefit time, etc)   | 7.7         |
| Pharmacist salary <sup>c</sup>   | 100,000     |
| Pharmacist fringe benefit rate   | 25%         |
| Total labor cost per pharmacist FTE  | \$135,000   |
| Total labor cost for all additional pharmacist medication reconciliation FTEs  | \$1,033,594 |

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### ROI Calculator

|   | Year 0      | Year 1      | Year 2      | Year 3      | Year 4      | Year 5      |
|---|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Capital Purchase</b>                                       |             |             |             |             |             |             |
| Retrofitting space for new clinical pharm                     | \$20,000    |             |             |             |             |             |
| <b>Total Capital Expenses</b>                                 | \$20,000    | N/A         | N/A         | N/A         | N/A         | N/A         |
| <b>Ongoing Operating Expenses</b>                             |             |             |             |             |             |             |
| Additional pharmacist labor required for medication r         | \$1,033,594 | \$1,054,266 | \$1,075,351 | \$1,096,858 | \$1,118,795 |             |
| <b>Total Annual Operating Expenses</b>                        | \$1,033,594 | \$1,054,266 | \$1,075,351 | \$1,096,858 | \$1,118,795 |             |
| <b>Ongoing Savings</b>  |             |             |             |             |             |             |
| Adverse drug event (ADE) treatment costs avoided <sup>1</sup> | \$2,199,488 | \$2,199,488 | \$2,199,488 | \$2,199,488 | \$2,199,488 |             |
| Institution specific sensitivity analysis <sup>2</sup>        | \$0         | \$0         | \$0         | \$0         | \$0         |             |
| <b>Total Annual Savings Potential</b>                         | \$2,199,488 | \$2,199,488 | \$2,199,488 | \$2,199,488 | \$2,199,488 |             |
| <b>Total Annual Net Savings (Cost)</b>                        | (\$20,000)  | \$1,165,894 | \$1,145,222 | \$1,124,137 | \$1,102,630 | \$1,080,692 |
| <b>Cumulative Net Savings (Cost)</b>                          | (\$20,000)  | \$1,145,894 | \$2,291,116 | \$3,415,252 | \$4,517,882 | \$5,598,574 |

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### Take Home Points

- ❖ Accurate medication history is important for patient safety
- ❖ Not easy! Can take time
- ❖ Refer to medication list when possible, but review and verify it with patient
- ❖ Use open-ended questions and prompts to elicit a complete history
- ❖ Get additional help when necessary
- ❖ Document if more work will be required

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### Discussion

- ❖ What gaps in knowledge and skills do you see at your institution?

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## Handoff Simulations



## Handoff Simulations

- ❖ Split into groups of **three**.
- ❖ Play the role – **patient, clinician, observer** – listed on the packet you receive.
  - *Each packet has specific instructions + supporting materials as needed*
- ❖ You will have **15 min** for the role-play, followed by **5 min** of debrief in your group.
  - Clinician, then patient, then observer



## Handoff Simulations

- ❖ To save time, you can skip the following:
  - Introduction to patient/caregiver
  - Confirm patient identifiers
  - Screen for allergies and reactions



## Debrief Within Your Groups

- ❖ Clinician
  - How did it feel to conduct the interview?
  - What was easy? What was hard?
- ❖ Patient
  - How did it feel to be interviewed?
  - How did the clinician react to your role-playing?
- ❖ Observer
  - What did the clinician do well? What needed improvement? How accurate was the list?



## Wrap Up: Why Role-Plays?



- ❖ Reflection **in** action
- ❖ Reflection **on** action

Tierney T and Nestel D. Role-play for medical students learning about communication: Guidelines for maximizing benefits. BMC Medical Education. 2007; 7:3.  
Schon DA: The Reflective Practitioner Jossey-Bass: San Francisco; 1983.



## Discussion

- ❖ Can you see MRAs doing this at your institution?
- ❖ What gaps in knowledge and skills do you see at your institution?



**1. If you already have a home medication list on a patient being admitted to the hospital, you should:**

- A. Assume it's correct if less than a month old
- B. Read the medications and ask the patient to verify them one at a time
- C. Have the patient tell you what medications they are taking first
- D. None of the above

**1. If you already have a home medication list on a patient being admitted to the hospital, you should:**

- A. Assume it's correct if less than a month old
- B. Read the medications and ask the patient to verify them one at a time
- C. Have the patient tell you what medications they are taking first
- D. None of the above

**2. Medications that patients might otherwise forget to tell you unless prompted include:**

- A. Non-oral medications
- B. Non-prescription medications
- C. Weekly or monthly medications
- D. PRN medications
- E. A and C
- F. All of the above

**2. Medications that patients might otherwise forget to tell you unless prompted include:**

- A. Non-oral medications
- B. Non-prescription medications
- C. Weekly or monthly medications
- D. PRN medications
- E. A and C
- F. All of the above

**3. There is no easy way to figure out what a medication is just by the pill's appearance:**

- A. True
- B. False

**3. There is no easy way to figure out what a medication is just by the pill's appearance:**

- A. True
- B. False

**4. What is the minimum number of medication sources you need to feel confident in the accuracy of a home medication list?**

A. One  
 B. Two  
 C. Three  
 D. Four

| Option | Percentage |
|--------|------------|
| One    | 0%         |
| Two    | 0%         |
| Three  | 0%         |
| Four   | 0%         |

**4. What is the minimum number of medication sources you need to feel confident in the accuracy of a home medication list?**

A. One  
 B. Two  
 C. Three  
 D. Four

**5. Which of the following would not be considered an "objective" source of medication information?**

A. An ambulatory EMR list  
 B. The patient's own medication list  
 C. The patient's spouse's memory  
 D. The patient's medication bottles  
 E. None of the above are "objective"

| Option                            | Percentage |
|-----------------------------------|------------|
| An ambulatory EMR list            | 0%         |
| The patient's own medication list | 0%         |
| The patient's spouse's memory     | 0%         |
| The patient's medication bottles  | 0%         |
| None of the above are "objective" | 0%         |

**5. Which of the following would not be considered an "objective" source of medication information?**

A. An ambulatory EMR list  
 B. The patient's own medication list  
 C. The patient's spouse's memory  
 D. The patient's medication bottles  
 E. None of the above are "objective"

**6. Your patient has a medication list and you have one as well (from the outpatient EMR). The two sources agree and the patient seems knowledgeable about his medications. A reasonable next step is to:**

A. Be done taking the medication history  
 B. Gather a third source just to make sure  
 C. Talk to the patient's PCP  
 D. D. None of the above

| Option                                  | Percentage |
|---|------------|
| Be done taking the medication history   | 0%         |
| Gather a third source just to make sure | 0%         |
| Talk to the patient's PCP               | 0%         |
| D. None of the above                    | 0%         |

**6. Your patient has a medication list and you have one as well (from the outpatient EMR). The two sources agree and the patient seems knowledgeable about his medications. A reasonable next step is to:**

A. Be done taking the medication history  
 B. Gather a third source just to make sure  
 C. Talk to the patient's PCP  
 D. D. None of the above



**7. When taking a BPMH, the history taker should ask about:**

- A. Medication adherence
- B. Medication side-effects
- C. The last time medications were taken
- D. All pharmacies where prescriptions are filled
- E. A and D
- F. All of the above

|   |    |
|---|----|
| Medication adherence                          | 0% |
| Medication side-effects                       | 0% |
| The last time medications were taken          | 0% |
| All pharmacies where prescriptions are filled | 0% |
| A and D                                       | 0% |
| All of the above                              | 0% |

**7. When taking a BPMH, the history taker should ask about:**

- A. Medication adherence
- B. Medication side-effects
- C. The last time medications were taken
- D. All pharmacies where prescriptions are filled
- E. A and D
- F. All of the above

**8. If a patient cannot provide a medication list, cannot recall medications from memory, and cannot resolve discrepancies between lists, the following sources should be utilized:**

- A. PCP's office
- B. Community pharmacy
- C. Family members or other caregivers
- D. Recent discharge summary
- E. All of the above

|                            |    |
|----------------------------|----|
| PCP's office               | 0% |
| Community pharmacy         | 0% |
| Family members or other... | 0% |
| Recent discharge summary   | 0% |
| All of the above           | 0% |

**8. If a patient cannot provide a medication list, cannot recall medications from memory, and cannot resolve discrepancies between lists, the following sources should be utilized:**

- A. PCP's office
- B. Community pharmacy
- C. Family members or other caregivers
- D. Recent discharge summary
- E. All of the above

**Role-Play**

- ❖ I'll play the role of the patient
  - Jane Doe, a 57-year-old female who presents from rehab with abdominal pain and distension concerning for Ogilvie's
  - HPI:
    - Recent patellar fracture
    - History of gastroparesis
    - Now with several days of abdominal pain, distention
    - KUB shows marked colonic dilation

**Patient Medical History**

- ❖ Hypothyroidism
- ❖ DVT/PE 6 months ago
- ❖ Gastroparesis
- ❖ Depression
- ❖ Patellar fracture

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### Role-Play

- ❖ Interview the patient regarding her medications using the techniques we just discussed
- ❖ “Think aloud” as you go through the process
- ❖ “Access” sources of medication data before or after seeing the patient as you normally would. You can ask for additional sources of data, then I will provide those sources if asked.
- ❖ At the end, you should compile and record the best possible medication list.



### Outpatient EMR Medications – 2 months ago unless otherwise noted

- |   |  |
|---|--|
| ❖ Advair 500/50 INH BID                                   | ❖ Trazodone 100 mg PO QHS                            |
| ❖ Benadryl 25 mg PO TID 30 min prior to meals             | ❖ Pregabalin 150 mg PO TID                           |
| ❖ Calcium carbonate 1250 mg (500 mg elemental Ca) 1 PO QD | ❖ Fluoxetine 40 mg PO QD – last ordered 3 months ago |
| ❖ Flonase 2 sprays QD (each nostril)                      | ❖ Fluconazole 150 mg PO Q week while on erythromycin |
| ❖ Omeprazole 20 mg PO BID                                 | ❖ Erythromycin 250 mg PO TID with meals              |
| ❖ Vesicare 5 mg PO QD                                     | ❖ Miconazole vaginal 2% cream, 1 applicator PV QHS   |
| ❖ Dronabinol 2.5 mg PO QID                                | ❖ Albuterol INH 1 puff q4-6 hours prn wheezing       |
| ❖ Rivaroxaban 20 mg PO QD                                 |  |
| ❖ Levothyroxine 125 mcg PO QD                             |  |



### Hospital Discharge Orders – 6 month ago

- Claritin 10 mg PO QD prn seasonal allergies
- Albuterol INH 1 puff q4-6h prn wheezing
- Ativan 0.5 -1 mg q6h prn nausea
- Trazodone 100 mg PO QHS prn insomnia



### Pharmacy Prescription Fill Data – filled within the last month unless noted below

- |   |  |
|---|--|
| ❖ Advair 500-50 INH BID   | ❖ Metronidazole 500 mg PO BID #14, last filled 3 months ago                            |
| ❖ Flonase 2 sprays in each nostril QD                                 | ❖ Miconazole vaginal 2% cream, 1 applicator PV QHS                                     |
| ❖ Dronabinol 2.5 mg PO QID  | ❖ Albuterol INH 1 puff q4-6 hours prn wheezing   |
| ❖ Omeprazole 20 mg PO BID   | ❖ Loratadine 10 mg PO QD prn seasonal allergies  |
| ❖ Vesicare 5 mg PO QD   | ❖ Oxycodone 5 mg tablets, take 1-3 tabs q3h as needed, #200 – last filled 8 months ago |
| ❖ Rivaroxaban 20 mg PO QD   | ❖ Hydrocodone-acetaminophen 5-300, take 1 tab q6h prn #30 – last filled 10 months ago  |
| ❖ Levothyroxine 100 mcg PO QD 1 month ago, 125 mcg PO QD 4 months ago |  |
| ❖ Trazodone 100 mg PO QHS   |  |
| ❖ Amitriptyline 50 mg QHS   |  |
| ❖ Duloxetine 30 mg PO QAM – last filled one month ago                 |  |
| ❖ Fluoxetine 40 mg PO QD - #30, last filled 3 months ago              |  |



### Conversation with Psychiatrist

- ❖ Prescribes the following:
  - Duloxetine 30 mg PO QAM – switched to this from fluoxetine 1 month ago
  - Trazodone 100 mg PO QHS
  - Ativan 0.5 mg q8h prn
  - Pregabalin 150 mg PO TID – calls it in to drug store near psychiatrist (Skendarian Apothecary)
  - Oxycodone 10 mg tabs PO Q4-6h prn – calls it in the same drug store



### Gold Standard

- |   |   |
|---|---|
| ❖ Ativan 0.5 mg q8h prn – takes it 2-3 times a day  | ❖ Duloxetine 30 mg PO QAM – switched to this from fluoxetine 1 month ago            |
| ❖ Fluconazole 150 mg Q week while on erythromycin – stopped taking it because misplaced it  | ❖ Advair 500/50 INH BID – patient takes it 3-4 times a week                         |
| ❖ Benadryl 25 mg PO TID before meals – only takes it if she doesn't need to do anything for the rest of the day because it makes her drowsy. Takes it about 3-4 times a week. Gets OTC. | ❖ Levothyroxine 100 mcg PO QD (recently changed from 125 mcg) – does not take it    |
| ❖ Erythromycin 250 mg TID with meals – stopped taking it because it gives her yeast infections  | ❖ Omeprazole 20 mg PO BID   |
| ❖ Vesicare (solifenacin) 5 mg PO QD   | ❖ Pregabalin 150 mg PO TID  |
| ❖ Miconazole 2% vaginal cream 1 applicator PV QHS   | ❖ Rivaroxaban 20 mg PO QD   |
| ❖ Calcium carbonate 1250 mg (500 mg elemental Ca) 1 PO QD (buys it OTC)   | ❖ Trazodone 100 mg PO QHS   |
| ❖ Dronabinol 2.5 mg PO QID  | ❖ Oxycodone 10 mg tabs PO Q4-6h prn – Takes 3-4 a day                               |
| ❖ Ergocalciferol 50,000 capsule once a week   | ❖ Albuterol INH 1 puff q4-6 hours prn wheezing – has not needed it in last 3 months |
|   | ❖ Claritin 10 mg PO QD – has not taken in 3 months                                  |
|   | ❖ Flonase 2 sprays each nostril QD – has not taken it in 3 months                   |




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| <b>High-Performance Behaviors</b>  |                          |
|--|--------------------------|
| Asks the patient open-ended questions about what medications she or he is taking (i.e., doesn't read the list and ask if it is correct)  | <input type="checkbox"/> |
| Uses probing questions to elicit additional information: non-oral meds, non-daily meds, PRN medications, non-prescription meds   | <input type="checkbox"/> |
| Uses other probes to elicit additional medications: common reasons for PRNs, meds for problems in the problem list, meds prescribed by specialists   | <input type="checkbox"/> |
| Asks about adherence   | <input type="checkbox"/> |
| Uses at least two sources of medications, ideally one provided by the patient and one from another “objective” source (e.g., patient's own list and ambulatory EMR med list)   | <input type="checkbox"/> |
| Knows when to stop getting additional sources (e.g., if patient has a list or pill bottles and seems completely reliable and data are not that dissimilar from the other sources, and/or the differences can be explained)                               | <input type="checkbox"/> |
| Knows when to get additional sources if available (e.g., if patient is not sure, relying on memory only or cannot resolve discrepancies among the various sources of medication information)   | <input type="checkbox"/> |
| When additional sources are needed, uses available sources first (e.g., pill bottles present). Then obtains pharmacy data. If the medication history is still not clear: obtains outpatient provider lists, pill bottles from home and/or other sources. | <input type="checkbox"/> |
| Uses resources like Drugs.com to identify loose medications (i.e., for a bag of medications, not in their bottles, provided by a patient)  | <input type="checkbox"/> |
| Returns to patient to review new information, resolve all remaining discrepancies  | <input type="checkbox"/> |
| Gets help from other team members when needed  | <input type="checkbox"/> |
| Educates the patient and/or caregiver of the importance of carrying an accurate and up to date medication list with them   | <input type="checkbox"/> |

## Q+A

### Questions? Concerns?



## Introduction to Day 2

- ❖ Move from being the clinician to being the teacher
  - How to run these simulations
  - How to give feedback
  - Other needed steps to ensure success of this program
- ❖ Barriers to implementation
  - How to overcome them

