



How-to Guide: Prevent Adverse Drug Events by Implementing Medication Reconciliation

Prevent adverse drug events (ADEs) by reliably implementing medication reconciliation at all transitions in care – admission, transfer, and discharge.

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Introduction

What is the Institute for Healthcare Improvement (IHI)?

The Institute for Healthcare Improvement (IHI) is a not-for-profit organization leading the improvement of health care throughout the world. IHI helps accelerate change by cultivating promising concepts for improving patient care and turning those ideas into action. Thousands of health care providers participate in IHI’s groundbreaking work.

What is a How-to Guide?

IHI’s How-to Guides address specific health care interventions hospitals and/or entire health systems can pursue to improve the quality of health care. These interventions align with several national initiatives of the IOM, AHRQ, CMS, Joint Commission, CDC, as well as the Department of Health and Human Services’ “Partnership for Patients” initiative.

This material was developed for the IHI 100,000 Lives Campaign (2004-2006) and the 5 Million Lives Campaign (2006-2008), both voluntary initiatives to protect patients from medical harm. Both Campaigns involved thousands of hospitals and communities from around the United States in specific interventions.

5 Million Lives Campaign Donors

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Contributors

The American Society of Health-System Pharmacists generously acted as a scientific partner and advisor in our work on this intervention.

What Is “Medication Reconciliation”?

The term “medication reconciliation” has often been misinterpreted. Health care providers often confuse the need to obtain a medication list to determine treatment with the three-step process of medication reconciliation.

There is no question that a medication list is necessary when a patient presents for treatment in a hospital or physician office; this is part of good care. If medications are changed or discontinued, it is necessary to make modifications to that list and communicate that information to the patient and to other providers who need to know.

Medication reconciliation is the process of creating and maintaining the most accurate list possible of all medications a patient is taking — including drug name, dosage, frequency, and route — and using that list to guide therapy. The goal is to provide correct medications to the patient at all transition points within the hospital. Medication reconciliation can be considered complete when each drug the patient is taking has been actively continued, discontinued, held, or modified at each transition point.

Hospitals have taken different approaches to complete this step. In some hospitals, it is the responsibility of the physician to indicate which medications have been discontinued or changed based on treatment decisions. In other scenarios, if any pre-admission medication is either not ordered or not explicitly declared to be inappropriate, the nurse or pharmacist should contact the patient’s physician. The physician should then either order the medication or formally confirm that the omission was deliberate.

Each time a patient moves from one setting to another, clinicians should review previous medication orders alongside new orders and plans for care, and reconcile any differences.

The medication reconciliation process involves three steps:

- Verification (collection of the medication history);
- Clarification (ensuring that the medications and doses are appropriate); and
- Reconciliation (documentation of changes in the orders).

Preventing adverse drug events (ADEs) is the impetus behind the concept of medication reconciliation. It was developed by Jane Justesen, a nurse at Luther Midelfort-Mayo Health System in Eau Claire, Wisconsin, as part of an IHI initiative. Among other things, Justesen’s team at Luther Midelfort pioneered the tools and forms needed to create, update, and reconcile a patient’s medication record during hospitalization.

The process starts when the patient is admitted to the hospital, continues whenever the patient is transferred to a different level of care, and occurs again when the patient is discharged from the hospital. In a broader context, medication reconciliation also applies to ambulatory procedures where medications or doses may be changed and in the office practice setting — at any point in the patient’s care when medications are changed. For this reason, it is important that care providers in all settings ensure that a

patient's medication list is kept up to date. Another way to help facilitate this process is to ensure that patients are active participants by carrying a list of their medications with them at all times.

The Case for Medication Reconciliation

An Example from...

Luther Midelfort-Mayo Health System Eau Claire, WI

Experience from Luther Midelfort-Mayo Health System in Eau Claire, Wisconsin, has shown that poor communication of medical information at transition points is responsible for as many as 50% of all medication errors in the hospital and up to 20% of adverse drug events (ADEs).

[Improvement Report: Reducing ADEs Through Medication Reconciliation.](#)

Medication errors are one of the leading causes of injury to hospital patients, and chart reviews reveal that over half of all hospital medication errors occur at the interfaces of care.¹

A multidisciplinary check of medication orders for pediatric cancer patients revealed that 42% of the orders being reviewed needed to be changed.²

Another study, also of pediatric cancer patients, revealed discrepancies between medication orders and information from patient/guardian or prescription labels on the container 30% of the time.³ A study of hospitalized patients on a family practice service identified 0.5 errors per patient on admission and 3.3 errors per patient on discharge.⁴

A study demonstrated that 30% of elderly patients' medication information available to the ED physician at the time of the initial diagnostic and therapeutic intervention differed from that obtainable from outside caregivers.⁵ A study in ambulatory oncology clinics found 81% of patients' medication lists had at least one error of omission.⁶

¹ Rozich JD, Resar RK. Medication safety: One organization's approach to the challenge. *JCOM*. 2001;8(10):27-34.

² Branowicki P. Sentinel events: Opportunities for change. Presentation at Massachusetts Coalition for the Prevention of Medical Errors Conference. November 18, 2002.

³ Billman G. Medication Coordination for Children with Cancer (Children's Hospital – San Diego). Presentation at AAP Patient Safety Summit. May 21, 2002.

⁴ Varkey P, Cunningham J, O'Meara J, et al. Multidisciplinary approach to medication reconciliation in an academic setting. *Am J Health-System Pharm*. 2007;64:850-854.

⁵ Cohen V, Jellinek SP, Likourezos A, Nemeth I, Paul T, Murphy D. Variation in medication information for elderly patients during initial interventions by emergency department physicians. *Am J Health Syst Pharm*. 2008 January 1, 2008;65(1):60-64.

⁶ Weingart SN, Cleary A, Seger A, et al. Medication reconciliation in ambulatory oncology. *Jt Comm J Qual Patient Saf*. 2007;33(12):750-757.

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In the intensive care unit, physician-obtained medication histories on 200 patients contained 1,628 variances relative to pharmacist-obtained medication histories.⁷

A review of 577 discharge drug summaries found 66% contained at least one inconsistency. There were 393 drug omissions, 32% of which were potentially harmful. Seventeen percent of all medications were unjustified. The unjustified medication was potentially harmful in 16% of cases.⁸

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

Potential Impact of Medication Reconciliation

The reconciling process has been demonstrated to be a powerful strategy to reduce medication errors as patients move from one level of care to another.

- A series of interventions, including medication reconciliation, introduced over a seven-month period, successfully decreased the rate of medication errors by 70% and reduced adverse drug events by over 15%.⁹
- In another study, the utilization of pharmacy technicians to initiate the reconciliation process by obtaining medication histories for the scheduled surgical population reduced potential adverse drug events by 80% within three months of implementation.¹⁰
- A successful reconciliation process also reduces work and re-work associated with the management of medication orders. After implementation, nursing time at admission was reduced by over 20 minutes per patient. The amount of time that pharmacists were involved in discharge was reduced by over 40 minutes.¹¹
- A program was described in which a nurse discharge advocate worked with patients during their hospital stay to arrange follow-up appointments, confirm medication reconciliation, and conduct patient education with an individualized instruction booklet that was sent to their primary care provider. A clinical pharmacist called patients two to four days after discharge to reinforce the

⁷ Hatch J, Becker T, and Fish J. Difference between pharmacist-obtained and physician-obtained medication histories in the intensive care unit. *Hospital Pharmacy*. 2011; 46(4):262-268.

⁸ Perren A, Previsdomini M, Cerutti B, Soldini D, Donghi D, Marone C. Omitted and unjustified medications in the discharge summary. *Qual Saf Health Care*. 2009;18:205-208.

⁹ Whittington J, Cohen H. OSF Healthcare's journey in patient safety. *Quality Management in Health Care*. 2004;13(1):53-59.

¹⁰ Michels RD, Meisel S. Program using pharmacy technicians to obtain medication histories. *Am J Health-Sys Pharm*. October 1, 2003;60:1982-1986.

¹¹ Rozich JD, Resar RK, et al. Standardization as a mechanism to improve safety in health care: Impact of sliding scale insulin protocol and reconciliation of medications initiatives. *Joint Commission Journal on Quality and Safety*. 2004;30(1):5-14.

discharge plan and review medications. This program resulted in a 23.8% reduction in hospital utilization.¹²

- On the other hand, a pharmacist-managed discharge program resolved all discrepancies at the point of discharge but did not result in a change in utilization.¹³
- A study of patients seen in four academic, ambulatory primary care internal medicine clinics tested interventions to provide performance feedback and training to the health care team, and increase patient awareness and participation in the medication reconciliation process. The authors found that the completeness of medication lists improved from 20.4% to 50.4% (p=0.001). Correctness of medication lists improved from 23.1% to 37.7% (p=0.087). Patient participation in the medication reconciliation process increased from 13.9% to 33% (p=0.001). The medication list accuracy improved from 11.5% to 29% (p=0.014).¹⁴
- The implementation of a comprehensive medication reconciliation program to reduce errors in admission and discharge medication orders at an academic medical center reduced medication errors from 90% to 47% in surgical patients.¹⁵

¹² Jack BW, et al. A reengineered hospital discharge program to decrease rehospitalization: A randomized trial. *Ann Intern Med.* 2009 Feb 3;150-178.

¹³ Walker PC, Bernstein SJ, Jones JN, Piersma J, Kim HW, Regal RE, et al. Impact of a pharmacist-facilitated hospital discharge program, a quasi-experimental study. *Arch Intern Med.* 2009;169(21):2003-2010.

¹⁴ Nassaralla CL, Naessens JM, Hunt VL, Bhagra A, Chaudhry R, Hansen MA. Medication reconciliation in ambulatory care: attempts at improvement. *Quality and Safety in Healthcare.* 2009;18:402-407.

¹⁵ Murphy EM, Oxencis CJ, Klauck JA, Meyer DA, Zimmerman JM. Medication reconciliation at an academic medical center: Implementation of a comprehensive program from admission to discharge. *American Journal of Health-System Pharmacy.* 2009;66(23):2126-2131.

Recent News on Medication Reconciliation

Medication reconciliation continues to be a challenge for many hospitals and care settings. However, there are examples of effective implementations, including those identified in the Campaign Mentor hospitals¹⁶ and the “Medication Reconciliation Innovation Challenge” hospitals.¹⁷

In September 2007, the Joint Commission convened the Medication Reconciliation Summit to accomplish the following:

- Review the current status of medication reconciliation efforts nationally;
- Identify barriers to implementation and ways to overcome them;
- Identify best practices;
- Review data that medication reconciliation efforts improve patient care;
- Consider modifications to National Patient Safety Goal (NPSG); and
- Work towards a consensus statement re: where efforts should be focused, best practices, and implementation guidelines.

The Joint Commission published a revised National Patient Safety Goal on medication reconciliation in 2011.¹⁸

The American Medical Association published “The Physician’s Role in Medication Reconciliation: Issues, strategies and safety principles” as part of the association’s “Making Strides in Safety” program. The AMA worked to describe the importance of medication reconciliation as part of an overall safety strategy and the role of physicians.

A number of articles have been published in a variety of journals, many appearing in the *American Journal of Health-System Pharmacy* (AJHP). The focus of these articles ranges from the role of pharmacists to the use of technology to enhance the process.

The Institute for Safe Medication Practices (ISMP) conducted a survey of providers to determine processes in place.¹⁹ In the survey, “teamwork among disciplines” and “clearly defined protocols” were ranked the most important factors for success.

¹⁶ Institute for Healthcare Improvement: Medication Reconciliation (Prevent Adverse Drug Events). http://www.ihl.org/IHI/Programs/Campaign/mentor_registry_ade.htm. Accessed November 7, 2011.

¹⁷ Institute for Healthcare Improvement: Innovation at its Best: Medication Reconciliation. <http://www.ihl.org/knowledge/Pages/ImprovementStories/InnovationatItsBestMedRec.aspx>. Accessed November 7, 2011.

¹⁸ 2011 Hospital National Patient Safety Goals. http://www.jointcommission.org/assets/1/6/HAP_NPSG_6-10-11.pdf. Accessed November 7, 2011.

¹⁹ ISMP Survey On Medication Reconciliation. <http://www.ismp.org/survey/survey200604r0.asp>. Accessed November 7, 2011.

Overview of Medication Reconciliation

At Admission:

When the patient is admitted, collect a list of the medications the patient is taking. Make this information available to the prescriber when admission orders are written. If this isn't possible (for example, because of an urgent situation), collect the list of home medications and compare it with the list of admission orders within 24 hours. Do not rely solely on computerized lists from ambulatory charts, prescription benefit management companies, or retail pharmacies. Patients will often take medications different from those listed on these records. While no list is perfect, the list should not be considered complete without a direct conversation with the patient.

An Example from...

Children's Hospital of Pittsburgh Patient Care Policy and Procedure Manual, January 2006

"In emergent or urgent situations (which include but are not limited to transports, transfers, and traumas) when the resulting delay would cause harm to the patient, including situations in which the patient experiences a sudden change in clinical status, immediate care will take precedence. At the point when the patient is stabilized, the medication list will be reviewed."

At Transfer:

When transferring the patient from one level of care to another, the provider should consult the patient's home medication list, current medication orders, and the transfer orders. Hospitals are encouraged to make this process as simple as possible. Standardizing the location of the list makes it easier for providers to locate the list and complete this process. Indicating on the original list which medications should be re-started on transfer or change in level of care helps facilitate the process (e.g., "Hold warfarin until after surgery").

An Example from...

Pinnacle Health Medication Reconciliation Policy, Policy and Procedure Manual

"The provider should carefully consider whether each medication should be continued, resumed, or discontinued upon transfer and document this on the transfer order."

At Discharge:

As at transfer, the provider should consult the patient’s home medication list and current medication orders, and compare them with the discharge medication orders to ensure that medications are appropriately continued, resumed, or discontinued. Make sure there is no confusion resulting from formulary or dose form changes that occurred in the hospital. Share the new list with the patient and the next provider in care or the coordinator of care for that patient. Be sure the patient knows which medications kept at home should no longer be taken and should be discarded.

Medication Reconciliation in the Ambulatory Setting for Procedures, Tests, Day Surgery, and the Emergency Department

The term “medication reconciliation” in these settings is often a misnomer, as there is no intent to continue them during the patient’s short stay. Instead, it is important to determine what medications the patient is taking; this may impact tests or medications administered during procedures or testing, or new medicines given at discharge. If no significant changes are to be made to the patient’s home regimen, no further work needs to occur. If significant changes are made, however, these changes need to be clearly communicated to the patient and an updated list provided.²⁰

Examples of successful processes in the ambulatory setting include the following:

For patients scheduled to receive contrast media during a diagnostic test, one group decided that the patient would receive information from the physician who requested the test about which medications should be discontinued prior to the test and when those medications should be re-started. When the patient presents for the imaging study, the technician will ask the patient if she/he has discontinued taking the medication(s). If not, then the technician will contact the requesting physician and ask for advice.

For patients undergoing day surgery, limited time in the surgical center meant that the team had to devise an efficient way to collect and review the medication list. Concerns are addressed by surgeons, prescriber, and patients together.

²⁰ Note: The addition of a short-term antibiotic or analgesic or the temporary holding of a chronic medication does not constitute a significant change. Patients should be given clear instructions as to what new medicines to take and when to seek more specific instructions from their primary caregiver.

Challenges in Implementing Medication Reconciliation

Here are some of the challenges faced by organizations that are working to implement medication reconciliation at all transitions in care:

- There is no clear owner of the process. In some cases, the medication list is completed by a nurse, in others by a pharmacist, and in others by a physician. However, no one has been specifically assigned to completing this process.
- There is no standardized process to ensure that the patient’s home medication list is available to all providers and compared with the most recent list of medications as patients move through different levels of care. Nurses from different units, or within the same unit, may be using different processes. Physicians do not have a defined process to communicate changes in doses or treatment plans using existing processes.
- Physicians are reluctant to order medications that may be unfamiliar to them or that have been prescribed by others.
- Staff do not have the time to complete each of the steps in the process.
- The focus has been on completing a form rather than meeting the intent of the intervention.
- There are many situations in which the patient may not know or is not in a position to provide a list of medications. Sometimes we hear statements such as “I take a blue pill” or “I do not remember the name.”
- Accurate sources of information may be difficult to identify unless one has taken the time to explore and test different methods to collect this information.
- A major challenge is ensuring that the original medication list is linked to the physician orders as the patient transitions from one level of care to another. Placing the medication list in a prominent location in the chart so that prescribers can easily access the information is a key to success.

The well-designed medication reconciliation process has the following characteristics:

- It uses a patient-centered approach.
- It is easy to complete the process for all involved. Staff recognize the “what’s-in-it-for-me” aspect of the change.
- It minimizes the opportunity for drug interactions and therapeutic duplications by making the patient’s list of home medications available when physicians prescribe medications.
- It provides the patient with an up-to-date list of medications.

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- It ensures that other providers who need to know have information about changes in a patient's medication plan.

Lessons from Successful Implementation of Medication Reconciliation

The following are lessons learned from the [Campaign's Mentor Hospitals](#)' successful implementation of medication reconciliation at various stages of the medication process:

- Agree on the definition of medication reconciliation.
- Senior leadership support and physician engagement are essential.
- Accept that no single universal process will meet the needs of all patients entering a hospital or having an ambulatory procedure. Consider developing different processes based on the point of entry and the patient population — e.g., pre-op patients, direct admits, emergency room patients, etc.
- Limit the total number of processes to as few as needed to meet the needs of your patients.
- Determine when medication reconciliation applies. By definition, medication reconciliation applies if a) a drug is started, b) a drug is discontinued, c) the dose is changed, or d) the frequency is changed.
- Agree that defects uncovered during the implementation of medication reconciliation are not the by-product of the reconciliation process. These defects are part of the larger medication system.
- Determine who is responsible for the different steps of the medication reconciliation process and hold staff, including physicians, in those positions accountable.
- Develop a process that makes it easy to complete medication reconciliation; this may include the use of a form.
- Medication reconciliation is not about filling out a form. A form is a tool to help document and guide the process. Instead, medication reconciliation is at its core a critical thinking function.

An Example from...

Contra Costa Regional Medical Center Martinez, CA

Contra Costa achieved success in medication reconciliation with a few steps. The hospital had 45-minute, focused weekly meetings, a physician champion, and pilots followed by spread. In addition, the hospital adopted and adapted Med Rec/Order forms, which they generated electronically for all in-hospital transfers. This not only improved Contra Costa's overall efficiency, but reduced work for caregivers by reducing the number of forms they had to fill.

- Approach medication reconciliation from the patient’s perspective. Design a process that includes and meets the patient’s needs and expectations.
- Engage clinics and physician offices in the process. In order to ensure that medication reconciliation is completed for all patients, establish communication links among clinics, nursing homes, and physician practices.
- For ambulatory procedures, identify who is in the best position to complete the medication list review. One method may be to link surgeons and primary care providers to review changes in medications.

An Example from...

**Buena Vista
Regional Medical Center
Storm Lake, IA**

Buena Vista’s Inpatient Care Coordinators call discharged patients to verify that they understand their discharge medication orders. They frequently catch misses when patients demonstrate a lack of understanding of their discharge meds.

This Center takes Med Rec into the community setting by communicating regularly with local physician offices, home health providers, pharmacies, and long-term care providers to verify medication orders, both at admission and discharge.

Electronic medication lists are saved for frequently admitted patients. Although Buena Vista does not yet have an electronic medical record, it maintains an electronic version of current medication lists at the time of discharge for patients who are frequently readmitted.

Buena Vista has incorporated compliance with Med Rec standards into annual employee evaluations. It has defined the behavior and evaluates compliance. Staff are engaged in making changes to the process.

- Do not develop a medication reconciliation process in committee; engage frontline staff and physicians in developing the process.
- Use an improvement methodology such as the Model for Improvement.
- Develop a process to identify and mitigate failures.
- Provide appropriate training and education for staff. Training can take the form of simulation and hands-on education. Include techniques for interviewing patients to collect a medication list.

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- Develop guides and/or pamphlets about the “why” and “how” of medication reconciliation for staff and patients.
 - See “[Medication Reconciliation at Lewistown Hospital. A Guide for Health Care Providers.](#)” Medication Reconciliation, Legacy Health System.

An Example from...

New Milford Hospital New Milford, CT

New Milford Hospital trained all disciplines in Med Rec procedures using multiple education methods such as formal presentations, poster board presentations, quick-look guides, internal newsletters, electronic mail, and staff and department meetings.

- Do not rely on electronically obtained lists or electronically performed reconciliation functions. The list requires patient interaction. At the same time, do not expect perfection; there simply is no perfect medication list.
 - Resource: [Medication Safety Tool Kit.](#)
- If a form is not being used, or not used as designed, ask the intended users why this is happening, rather than continuing to use education and training to promote compliance.
- Involve patients in the design of the process — at the very least, in the design of a personal medication list/card.

An Example from...

Mercy Medical Center - Baltimore, MD

Nursing begins the process by collecting the home medication list and entering it into the EMR. The home medication list automatically populates the physician's order sets for admissions, transfers, and discharges. The physician will choose to continue, modify, or discontinue each of the medications. The pharmacy is able to view both the home medication list and ordered medications to alert physicians of any discrepancies. On discharge, the medication list is printed on the automated discharge instructions, of which a copy is given to the patient and the next care provider.

- Work with other hospitals and associations in your area to develop a universal medication card.²¹
- Develop a process to review medications if a physician is not familiar with medications beyond his/her specialty.
- Collaborate with long-term care and home care facilities to develop an efficient and effective process for both the hospital and facility staff.

²¹ Minnesota Alliance for Patient Safety (MAPS) – My Medicine List.

http://www.mnpatientsafety.org/index.php?option=com_content&task=view&id=57&Itemid=50. Accessed November 7, 2011.

Using the Model for Improvement

In order to move this work forward, IHI recommends using the Model for Improvement. Developed by Associates in Process Improvement, the Model for Improvement is a simple yet powerful tool for accelerating improvement that has been used successfully by hundreds of health care organizations to improve many different health care processes and outcomes.

The model has two parts:

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

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

Spread: After successful implementation of a change or package of changes for a pilot population or an entire unit, the team can spread the changes to other parts of the organization or to other organizations.

You can learn more about the Model for Improvement on www.ihl.org.

PDSA Worksheet

CYCLE: 1

DATE: 6/10/11



Project: ADE Medication Reconciliation

Objective for this PDSA Cycle: Team members try out the reconciliation procedure on a sample of closed patient records.

Plan:

Questions: How difficult is it to conduct medication reconciliation?

Predictions: The members of the team will be able to follow the procedure and agree on each reconciliation. Since the reconciliation process is not well established, expect to find some errors.

Plan for change or test – who, what, when, where:

1. Obtain a set of 20 closed patient records, selected by convenience.
2. Have each team member review the patient records, counting errors due to unreconciled medications.
3. Count medications, not doses.

Plan for collection of data – who, what, when, where:

Tally errors from unreconciled medications for each team member.

Do:

Carry out the change or test. Collect data and begin analysis.

Study:

Complete analysis of data:

How did or didn't the results of this cycle agree with the predictions that we made earlier?

Summarize the new knowledge we gained by this cycle:

Act:

List actions we will take as a result of this cycle:

Plan for the next cycle (adapt change, another test, implementation cycle?):

See examples of complete [PDSA cycles for Medication Reconciliation](#).

Setting Aims

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

Examples of aims at the organizational level:

- Reduce the percentage of unreconciled medications at admission, discharge, and transfer to zero within the next 18 months.
- Improve medication reconciliation by 75% on each unit at admission and discharge within the next 12 months.

As teams work on different steps in the reconciliation process, the aims should be specific to that portion of the project. For example:

- Reduce the percentage of unreconciled medications at admission on the pilot unit by 50% within the next three months.

Forming the Team

A team approach is needed to ensure that this process is completed successfully. We recommend using a multidisciplinary team consisting of, at a minimum, a nurse, a pharmacist, and a physician. Visit IHI.org for more information on [forming an effective team](#).

An Example from...

Mercy Medical Center Baltimore, MD

A multidisciplinary team, which included Nursing, Medical Staff, Pharmacy, Case Management, Administration, Quality, IT, and Risk Management, developed an automated medication reconciliation process in our hospital's EMR.

Admission Reconciliation

Getting Started

- Select the team and the pilot unit to begin testing. As patients may be admitted to the hospital from a number of points, select one point of admission (e.g., pre-operative screening or the emergency department).
- Using a simple flow diagram, determine the process in place at this time. (See [Luther Midelfort's Medication Reconciliation Flowsheet](#))
- Collect the medication history.

How to Collect the Medication List

- Interview the patient.
- If the patient is not able to provide the medication list, interview the patient's care provider (family member or friend), call the patient's primary care provider and/or the patient's pharmacy, and/or review a past medical record.
- Prepare a script to guide the interview process.
- Suggest that patients bring their home medications to each visit. Some hospitals have prepared durable bags printed with hospital the logo.
- Interview new admissions as a team, including pharmacists and nurses.
- Some organizations have tested using the Medication List as an Order Form.

Steps to take if the patient cannot remember a medication or if clarification is needed:

- Obtain a detailed description of the medication from the patient or a family member — dosage form, strength, size, shape, color, markings.
- Talk to any family members present or contact someone that could possibly bring in the medication or read it over the phone.
- Call the patient's pharmacy or contact the pharmacy benefits manager to obtain a list of medications that the patient has been filling regularly. However, be aware that the patient may be the best source of information. An increasing proportion of patients use mail-order pharmacies and a decreasing proportion of patients obtain prescriptions from pharmacies. (Source: Agency for Healthcare Research and Quality, MEPS, *Statistical Brief #200: Comparing Population Characteristics of Persons Purchasing Prescribed Drugs from Mail Order Pharmacies with Persons Purchasing Prescribed Drugs from Other Outlets, 2005*.) Data from pharmacy benefits managers will contain only information adjudicated through that system. Medications purchased out of pocket, over-the-counter medications, and alternative remedies will not be included.
- Contact the patient's physician/physicians to try and get an accurate list of the patient's current medications.
- Obtain previous medical records.

Examples of Patient Medication Lists

Use an actual jpeg image of a patient medical list. One sample image and a bunch of links would be easier to understand than a list of links.

Much time is spent in collecting a medication list when a patient is admitted to the hospital. Patients can play a vital role in medication reconciliation by carrying a list of the medications they are taking. Having this information available can help make the reconciliation process more efficient and effective.

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There are several models for medication lists. Examples of medication lists include the following (see IHI.org for additional examples):

- McLeod Health in Florence, South Carolina, worked with the hospital association and other local hospitals to develop a common medication list.
- Medical Information Card, St. Thomas Hospital
- California Pacific Medical Center's Health and Safety Passport
- St. Luke's Hospital in Cedar Rapids, Iowa, partnered with local physicians, Mercy Hospital, and the Iowa Pharmacy Association to create a city-wide program of medication cards that is supported by the hospitals, physician clinics, and local pharmacies.
- In Massachusetts, a statewide initiative, developed by The Massachusetts Coalition for the Prevention of Medical Errors, in collaboration with the Massachusetts Medical Society and with support from the Commonwealth's Betsy Lehman Center, includes the promotion of a medication list (Med List) and tips for using medications wisely to patients and their families, as well as promotion of a process known as reconciling medications by providers during medical visits. The initiative includes direct communication with physicians, patients, and community pharmacies detailing the importance of maintaining an up-to-date medication list and sharing it with all providers.
- The American Society of Health-System Pharmacists (ASHP) offers a format that patients can use to develop and manage their own lists.
- When developing a medication list or medication card, consider patient literacy needs. Examples of pictograms can be used to help patients understand how and when to take medications.
- AHRQ offers information on how to develop an easy-to-use "pill card" for patients, parents, or anyone who has a hard time keeping track of their medicines.
- The FDA has also developed a list to help track of medicines and dietary supplements.
- A medication log developed by the Cardiovascular and Public Health Detailing Programs for use in the Cholesterol Action Kit is one of many "Detailing Action Kits" from the DOHMH.
- A number of sites have been developed for patients to maintain their own personal health record (PHR). Some patients may feel more at ease with using a computer-based approach with proper security measures. Examples include products from Google, Microsoft, and Aetna Insurance.

Transfer Reconciliation

Getting Started

- Follow the first two steps for “Admission Reconciliation: Getting Started.”
- Test different ways to ensure that the patient’s home medication list and current inpatient orders are available to the clinician responsible for the transfer orders.
- Modify the original form used on admission, or create a new form if necessary. Hospitals have used the form used on admission and added columns to indicate changes to medications on transfer. You may determine that a notation in the chart is sufficient.
- Determine where medication reconciliation applies. Check the [Joint Commission Website](#) for the latest clarification.
- Determine who is the person responsible to ensure that the list is available at the time of transfer.
- Develop a process to deal with situations in which a physician is uncomfortable ordering medications with which he/she has little knowledge/experience (e.g., orthopedic surgeon restarting cardiac meds).

An Example from...

The Nebraska Medical Center Omaha, NE

The Ambulatory Medication Reconciliation program was started in January 2007. Prior to a patient arriving at the Nebraska Medical Center for a diagnostic test or procedure, the patient is contacted at home by nurses in pre-surgical/pre-diagnostic screening services. Along with obtaining the patient's history and insurance information, the nurse interviews the patient regarding their medications. The medication list is updated in medication reconciliation software. Drugs that will interact with procedure or diagnostic medications are flagged. The main goal of the Ambulatory Medication Reconciliation program is to ensure no significant drug interactions or contraindications exist between the patient's home medications and any medications that will be used during the procedure or diagnostic test. Following the procedure, the patient is given a copy of their medication list that has been reviewed by a health care professional.

Discharge Reconciliation

Getting Started

- Follow the first two steps for “Admission Reconciliation: Getting Started.”
- Test different ways to ensure that the patient’s home medication list and current inpatient orders are available to the clinician responsible for the discharge orders.
- You may determine that modifying the original form used on admission is useful.
- You may determine that a new form is needed.
- You may determine that a notation in the chart is sufficient.

Ambulatory Medication Reconciliation

Getting Started

- Determine when medication reconciliation applies. If significant changes to a patient's chronic medications are made, medication reconciliation applies. When in doubt, use good clinical reasoning: what is important to provide good patient care.
- Collecting a medication list before a procedure is always good practice (whether or not you're implementing medication reconciliation).
- If there are changes in medications or doses, determine who, in addition to the patient, needs to know that information.
- If a clinician is not familiar with specific medications, develop a process whereby appropriate consultation is available.
- Review the [JCAHO website](#) for updates regarding minimal medication use.
- [Sample form](#) from Cooper University Hospital.

Emergency Department Medication Reconciliation²²

- Determine when only a medication list is needed and when more detailed information such as dose, route, and frequency applies.
- If a patient will be admitted, it may be more appropriate to have the inpatient staff complete the admission reconciliation processes. Such processes should be applied consistently to ensure that nothing slips through the cracks.

Physician Office Medication Reconciliation

- Keep an up-to-date list of patient medications.
- Print out a list and ask patients to review while waiting for their appointment.
- Engage nurses in reviewing the list with patients before the physician sees the patient. Ask the nurses to indicate for the physician any possible discrepancies.
- Physicians should discuss and resolve with the patient any discrepancies by the end of the appointment.
- Update the clinic list of medications as needed after each appointment.
- Provide the patient with an up-to-date list as needed.

²² Paparella S. Medication reconciliation: Doing what's right for safe patient care. *Journal of Emergency Nursing*. 2006;32(6):516-520.

- Develop a form that allows clinicians to indicate that the list in the medical record was reviewed without having to re-write the list.
- Determine who else should be aware of changes to medications and if that communication is necessary. Examples: specialist to primary care provider (PCP), PCP to specialist, physician to pharmacist.
- The patient should always be included. When a patient is not capable of participating, include family and other caregivers.

Involving Patients

- The 2006 Institute of Medicine Report, *Preventing Medication Errors*, includes a recommendation that patients should be actively involved in the medication process.
- As the staff at OSF St. Joseph's Medical Center in Bloomington, Illinois, put it, "The patient is the only constant in medication reconciliation."
- Patient involvement can take many forms, ranging from contributing to developing the process, to designing patient medication lists, to ensuring that each patient carries his/her own list.
- Patients can be involved in different stages of implementation.
- Involve the patient during the discharge process by offering appropriate education and counseling on the proper use of medications, describing changes in doses, and informing the patient as to which medications the patient already has at home and which are discontinued.

How to Conduct a Medication Reconciliation Review

Medication Reconciliation Review is a process of examining closed patient records to identify errors related to unreconciled medications. Organizations that are considering creating a medication reconciliation process can use this tool to establish a baseline of errors from unreconciled medications.

- Ask five staff on a unit to describe the current process for medication reconciliation. If all five cannot describe the process in the same manner, there is chaos and there is not a reliable process in place.
- Determine whether or not the process is working as designed. If you have adopted a form to assist in medication reconciliation, the first measure should be simply: *Is the form where it should be in the chart? Yes or No.* Sample five records per week. If the form is not present in a sample of this number, collecting a larger sample will not provide any more information. If the form is not present, determine why not and fix the process using rapid Plan-Do-Study-Act (PDSA) cycles.

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- Once you determine that the form is present, the next measure should be simply: *Is the form being used as designed? Yes or No*. Sample five records per week. If the form is not being used as designed, why not? Is the form complex? Is it not available when needed?
- After addressing the first three questions, obtain a set of 20 closed patient records, using a random selection process. A [random number generator](#) is available on IHI.org.
- Once you have eliminated the process defects identified above, have each team member review the patient records, counting the number of unreconciled medications.
- At transfer, count the number of medications not reconciled when comparing the transfer orders with the patient medication list and the current medication list.
- At discharge, count the number of medications not reconciled when comparing the discharge orders with the home list and the list of current medications.
- Tally the number of unreconciled medications.
- The denominator in each case is the total number of medications that the patient should be taking.

Note:

- This is a count of medications, not doses.
- The rate of unreconciled medications may vary depending on the processes in place. Unless you have developed a robust reconciliation process, if you find very few unreconciled medications, suspect the quality of the review.
- The most robust metric is not the number of medications reconciled. Instead, it is the percentage of patients who had ALL of their medications reconciled at ALL key phases of care (admission, transfer, and discharge). After all, in order to be patient-centric the question should be framed as “how often did we do everything right?”

Identifying Unreconciled Medications at Transfer and Discharge

Look for discrepancies in medication orders between pre- and post-intra-hospital transfers, and discharge documents, using the following steps:

- Compare all medications ordered at transfer and discharge with any available information about medications the patient was taking prior to admission and the most recent inpatient orders. Each medication that is *not* ordered or commented on represents a discrepancy and should be counted as an unreconciled medication. Apply clinical judgment for the obvious, such as narcotic reversal protocols on discharge or pressors upon transfer out of the ICU.
- If staff is unable to determine whether a medicine has been intentionally omitted, it is unreconciled.
- Look for any adverse drug events that might be indicated in the charts or discharge summaries. Then review the details to see if the ADE was the result of the inadvertent discontinuation of a medication or an order that was missed at a point of transition (at admission, transfer to another

patient care unit, post-procedure, or discharge). If you find this, it counts as an error, as well as being an ADE.

Conducting the Medication Reconciliation Review: Tips for Collecting Data

Teams from IHI Collaboratives and the Massachusetts Coalition for the Prevention of Medical Errors suggest the following tips:

- Divide the process into several steps and share responsibilities.
- Involve administrative support to identify/pull charts.
- Develop a quick audit tool, and have nurses, MDs, and pharmacists from the implementing unit pull the necessary data from the subset of charts each person reviews.
- Assign responsibility for aggregating the data and developing charts that can be displayed on the units to one person and presented in reports to leadership (e.g., quality improvement representative or team leader).
- Engage clinicians in making decisions about measure definitions, clinical underpinnings of what really constitutes “unreconciled,” and actual chart review at least for the baseline and early data collection.
- Engage the best available resources, based on your own organization’s resource constraints.
- Consider using an experienced pharmacy technician to collect the medication history.
- Consider using pharmacy residents to collect the medication history.
- Incorporate the reconciliation review into an existing data collection program.
- Focus only on the parts of the chart that deal with your work. You should only need to review the reconciling form and the admission orders.
- Limit your sample to 20 charts per month on the unit where you are testing the process.
- Set a timer as a reminder to limit your review of each chart to 15-20 minutes.

Barriers That May Be Encountered

Staff may think of medication reconciliation as additional work.

Collecting a patient’s medication list is part of good care. How can one provide clinical care without knowing what medications a patient is taking? JCAHO, as part of existing medication management standards and elements of performance, requires that hospitals collect a medication list at admission and have it available at transitions in care.

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Developing the forms and the system to ensure that the process is completed reliably each time requires some time. In the long run, however, reconciling medications saves time for physicians, nurses, and pharmacists.²³ Completing this process also reduces the opportunity for errors and the associated adverse events that can lead to harm.

“Isn’t this the physician’s job?”

Reconciling medications is a team process. All disciplines must be involved and complete portions of the process. Each discipline has a role in the medication system. Hospitals should design a process that capitalizes on existing staff and optimizes the role of each. The patient can also play a key role in facilitating the verification and clarification steps.

Fear of change

All change is difficult. Many nurses interviewed responded that collecting the appropriate medication history and ensuring that the admit orders reflect appropriate therapy are essential to decreasing errors and rework. The framework suggested by IHI is one that helps to build reliability into the process.

Communication breakdown

Organizations have not been successful when they failed to communicate with staff about the importance of reconciling medications, as well as the ongoing teaching of new staff.

Physician and staff “partial buy-in”

In order to enlist support and engage staff, it is important to share baseline data as to how reliable the existing process is in reconciling medications. As you develop the process in your hospital, you will find ways to simplify and standardize, resulting not only in a decrease in errors but also in increased efficiency and satisfaction. Physicians are responsible for the ordering and management of the patient’s medication regimen. Clear accountability must be assigned.

Sometimes physicians are uncomfortable making decisions about medications they did not prescribe or are otherwise uncomfortable with. This is not a medication reconciliation problem; instead, it is a symptom of the lack of clarity of the role of the attending physician. Just as a physician may consult a specialist for a patient with congestive heart failure, a consult may be useful for medication management decisions. But ultimately, the attending physician has accountability for the care of the patient.

²³Rozich JD, Resar RK. Medication safety: one organization’s approach to the challenge. *JCOM*. 2001;8(10):27-34.

Medication reconciliation is adding many new steps

As hospitals continue to implement a reliable medication reconciliation process, they are uncovering defects in their existing systems. Hospitals are learning that they may not have been collecting an accurate list, that there were breakdowns in the rewrite process when patients transferred through different levels of care, that patients did not receive appropriate counseling on discharge, and that, in some cases, the hospital does not have information as to the next provider in care after discharge. These are not medication reconciliation issues. They are now visible.

“We don’t have enough staff.”

Assign the role of collecting the medication list to the person who is best suited, taking into consideration available resources. If an organization does not have enough pharmacists, consider engaging pharmacists only when needed. For example, Children’s Hospital of Pittsburgh adopted the following policy: “PHARMACY CONSULTATION REQUIRED for 10 or more medications and for patients on herbal products or TPN.”

“If we only had access to computerized databases, we would not have a problem.”

Many believe that access to computerized databases will facilitate the collection of a medication list. Although in some cases this may facilitate the process, studies indicate that improvements are needed. The percentage of patients with complete agreement between their computerized medication profile and what they were actually taking was 5.3%.²⁴ (Internal data from Fairview has this rate at 25%, unpublished.)

Databases developed internally, in the hospital or physician office, may be helpful in facilitating this process. The challenge is to ensure that the database is kept up to date and is easily accessible to those in need.

“Let’s give patients electronic cards that contain their medication lists.”

As technology advances, we will find new and innovative ways to help patients carry and maintain their medication lists and histories. It is important to note that not all high-tech interventions are appropriate for

²⁴ Kaboli PJ, McClimon BJ, Hoth AB, Barnett MJ. Assessing the accuracy of computerized medication histories. *Am J Manag Care.* 2004;10(11, pt 2):872-877.

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all patients. In focus groups, patients expressed a desire to have a human-readable medication list that they can carry with them.²⁵

“We seem to be losing momentum. We have been working at this for a long time.”

Hospitals that have been working on medication reconciliation for a long time realize that improving medication reconciliation is not a project that is completed in a short period of time. In order to maintain momentum, hospitals like Missouri Baptist use patient stories to remind staff about the importance of implementing a reliable process. Refocusing staff on the basic steps of medication reconciliation is helpful. Many that have expanded the components of medication reconciliation have added complexity and much additional work. Cooley Dickinson Hospital reminds staff that medication safety is a safety intervention, not just another task to perform. In addition to stories from your own organizations, others can be found through [ISMP](#) and cases can be found on AHRQ’s [Morbidity and Mortality Rounds](#).

²⁵ Whittington J, Martin L, McIlwain P. Institute for Healthcare Improvement summary report: 90-day project – medical reconciliation. October 31, 2007.

Tips and Tricks: Preventing Adverse Drug Events by Implementing Medication Reconciliation

More than 3,000 hospitals across the US have been working hard to implement these interventions. Here are some of the "tips and tricks" for successful testing and implementing of each intervention that we have gathered.

General tips for implementing medication reconciliation:

- Put the patient first.
- Take the time to understand the existing medication process in your organization to determine how medication reconciliation fits in.
- Implementing medication reconciliation surfaces other fundamental defects in the medication system. Determine to what extent these other defects should be corrected before implementing a successful medication reconciliation process.
- Senior leadership and clinical leadership must support the hospital's efforts to implement medication reconciliation.
- Test different processes; one process may not work for all patients and situations.
- Do not let "waiting to develop the perfect system" slow you down.
- Be aware that there may be additional work for physicians and staff.
- Reducing rework may offset some of the time invested in medication reconciliation at admission.
- Use clinical judgment to determine when medication reconciliation applies.
- Use stories of errors and rework to engage physicians and staff.
- Develop reliable processes that do NOT rely on vigilance and hard work to ensure their success.
- Take advantage of habits and patterns.
- Contact other hospitals for ideas that you can test in your own hospital.

Tips for collecting an accurate medication list:

- Collect the best list you can. Learn why the list is not complete and work on how to address these gaps.
- List the source of information: this may be useful in determining the reliability of the medication list.
- Defer to the person who is in the best position to collect this information — nurses, pharmacists, pharmacy technicians, residents, or physicians.
- Involve pharmacists with high-risk patients or those with complex medication regimens.

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- Develop a standard interview sheet to improve the information collected.
- One process may not work for all patients. Segment the processes and take advantage of pre-existing workflows. For example, collect medication histories from pre-op patients during routine pre-op screening.
- In all cases, interview the patient to confirm the dose and the frequency for each medication the patient is taking.
- If a patient has a caregiver, interview that individual to obtain a medication history.
- Clarify responsibilities for completing this process.
- Collaborate with other health care facilities to develop a common format for a patient's own medication list.
- Engage patients: Inform them of the importance of carrying this information with them as they visit different care providers.

Tips for streamlining the medication reconciliation process on admission:

- Incorporate the medication history into existing forms and processes.
- Determine if the medication history form can be used as an order form.
- Use technology to download information from an electronic health record.

Tips for completing medication reconciliation on transfer:

- Identify when medication reconciliation applies:
 - Any time the organization requires that orders be rewritten.
- For transitions not involving new medications or rewriting of orders, the organization determines whether reconciliation must occur.
- Develop policies and procedures to guide staff.
- Ensure that the original medication list is available at the time of transfer.
- Identify who is responsible for completing medication reconciliation.
- Develop a process to assist specialists ordering medications with which they have little familiarity.

Tips for completing medication reconciliation on discharge:

- Print medications from the pharmacy profile onto a form that can be used as a discharge order.
- Involve pharmacists in discharge reconciliation.
- Develop a process to assist specialists ordering medications with which they have little familiarity.

Tips for completing medication reconciliation for patients undergoing ambulatory procedures and emergency department:

- Determine if medication reconciliation applies.
- Differentiate the need for a medication history and the need for medication reconciliation.
- Segment the patient population; one process may not work for all patients.
- Review JCAHO’s description of “minimal medication use.”
- Adopt one form to begin medication reconciliation in the ED that can be used whether or not the patient is admitted.

Tips for working with others:

- Engage physician offices, asking that they keep the patient’s medication list current.
- Develop a standardized medication list for your region or state.
- Involve patients in developing the form.
- Publicize the importance of medication reconciliation on local cable TV outlets, church bulletins, senior center newsletters, and local press.
- Use “brown bag” events to review medications. Provide each patient with an up-to-date medication list.
- Work with community pharmacies to improve communication about medication histories.

Frequently Asked Questions

Medication Reconciliation: The Process

Who is responsible for completing the reconciliation process?

Reconciliation is the responsibility of nurses, pharmacists, and physicians. Each has a role in the process. Responsibility for the collection of the medication history may differ in each institution, based on resources and who is available. Physicians are expected to use the medication list during the writing of admission, transfer, and discharge orders and to communicate with nurses and pharmacists when those orders differ from the home list.

When should reconciliation take place?

Reconciliation should be completed as soon as possible after the patient has been admitted. Because it may be difficult to collect the medication list in this time frame — for example, on evening or night shifts — you should collect information on those medications that may be due before the day shift. Once the list has been collected, it is necessary to ensure that the list is then made available when admission orders are written.

At transfer, reconciliation should take place when new orders are written.

At discharge, reconciliation should take place when discharge orders are written.

Can you use the list as an order form?

Some organizations have developed a medication list that can also be used as an order form. This may include check marks to indicate if a medication should be continued, discontinued, or dose changed. Some organizations have elected not to use the list as an order form, as this may introduce opportunities for a new set of errors.

These forms should have a place for nurse's signature and physician's signature.

Teams should review implication of policies, bylaws, and state regulations.

How do you complete reconciliation on transfer?

First, develop a policy as to when reconciliation should take place. This policy should be based on the likelihood that a medication regimen may be changed or that medications being taken may affect the treatment plan.

As orders are written at transfer, the prescriber reviews the patient's medication history and list of current medications before writing the transfer orders. In order to communicate which

medications are discontinued, organizations have developed order forms similar to those used at admission, or added an additional column to an existing order form. The goal to keep in mind is that prescribers should review both the home medication list as well as the active hospital medication list when writing transfer orders. The process to support reconciliation at transfer will differ from institution to institution.

How do you complete reconciliation on discharge?

Compare the discharge orders with the medications that the patient is taking and with the medication list collected at admission. Appropriately restart or discontinue medications. The goal is to restart previous medications if necessary, avoid therapeutic duplications, and discontinue unnecessary medications.

What medications need to be reconciled?

Prescription medications, over-the-counter medications, and alternative or herbal remedies must be reconciled.

According to Dr. Rick Croteau, JCAHO:

“The list we have provided as a definition of ‘medication’ is an all-inclusive definition straight out of the accreditation manuals. Many of those items would rarely, if ever, be applicable to the reconciliation requirement since the patient-specific medication list for this purpose is intended to be what the patient is currently taking or has just recently received (if it is a one-time administration). Past medication history, childhood immunizations, etc., are not expected.”

However, current OTCs, herbals, and the like are relevant and should be included on the patient's list.

What really constitutes an unreconciled medication? Often there are clear clinical reasons why a med would be discontinued; should this really be counted as an error just because it wasn't documented?

Hospitals are using their own judgment in their evaluations. We are encouraging you to err on the side of over-counting errors to help encourage more rigorous documentation in patient charts, a key component of the safety principles embedded in improving communication and information transfer among caregivers. Keep in mind that assuming the intent of a prescriber is fraught with error; what may be an obvious omission of a medication may truly be an oversight.

One hospital handled this problem by calculating the baseline measure two ways, with all

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unknowns counted as errors and under a more lenient definition. Some examples of underlying assumptions:

- Discontinuation of warfarin when patient admitted for bleed
- Withholding oral medications prior to surgery was assumed to be proper practice
- Spironolactone, KCl omitted, assume because intention to diurese w/ Lasix
- Lasix converted oral to IV, assume intentionally based on diagnosis
- Zantac changed to Pepcid IV
- Prevacid changed to Pepcid IV

Regardless of where the reconciliation is initiated, what is the average time per patient required?

The time required varies by patient and patient type; obviously, more time is required when the patient and medication regimen is more complex. Differences in case-mix intensity make generalizations difficult. One average suburban hospital estimates the time required for admission reconciliation to be about 15 minutes per patient. However, there are no definitive data on this. Since the process is often integrated with other tasks, such as overall patient assessment, it might be difficult to measure. If you measure it and learn anything, please share with us.

What time frame is acceptable for a "current" history?

This is a local decision. OSF uses six weeks.

The Medication List

How important is it to have a complete and accurate medication list? We are having difficulty developing the accurate medication list.

A complete and accurate list is necessary in order to provide good care. However, this has been a challenge for all organizations. The goal is to develop the best list possible. Waiting until you have the perfect list will only delay your work in this area. As you continue with improving your process, and as reconciliation spreads through the ambulatory setting, teams will learn how to collect a complete and accurate list.

There are often two "initial" medication lists: what the doctor prescribed and what the patient is taking. Which should be considered the correct baseline?

This is another aspect of reconciliation. In some cases, neither is completely correct. Simply renewing either exposes the patient to a risk of adverse drug events. Both of these lists should be used as sources of information to develop an accurate medication list.

If information isn't available from the patient or family, and the admission occurs on the weekend, how do you suggest getting the medication list from the physician office?

This is a challenge, but how this gets worked out will depend on how physician offices are integrated with your organization. It might be easier in an organization where the physician offices are part of the hospital. You might be able to obtain some information from the patient's retail pharmacy. Remember, the goal is not perfection. You should do what you can to get a medication list that is as accurate as possible, but there will be occasions where you are not able to get anything.

So do you recommend that this be done in the ER as well?

Absolutely. A medication list is essential for patients who come to the ER, whether admitted or not. During their visit, they may receive medications or prescriptions which could interact with meds that they are already taking. However, when you start working on admission reconciliation, you need to evaluate whether the ER is the right place to start. This has worked in some places, but many others have found it easier to start first on an inpatient nursing unit and bring the ER into the process once it is underway.

The Stakeholders

How do you engage physicians?

Physicians are members of the health care team who have responsibility for writing admission orders. The reconciliation process should be designed so as not to add complexity to the process. It should be designed to reduce rework, eliminate steps when possible, and fit into the workflow of all staff. By sharing information about how many medications are not reconciled, how many errors may result, and the potential harm that patients may experience is helpful. Most importantly, it is vital that all staff understand the goals and how the process is designed.

We are getting lots of push-back that this is extra work. How do you work with nurses and physicians?

This process should be viewed as doing work in a new way. Reconciliation is a process that should be taking place for all patients for whom medications are ordered. By designing this work so that it is part of daily work and fits into the flow of care, teams are more likely to see adoption and spread of this process. Keep in mind the patient-centricity of this work. From the patient's perspective, most patients would be surprised and disheartened to learn that collecting an accurate medication list and making clinical decisions on the basis of that list are viewed as a burden and not done as a matter of routine.

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How do we involve patients?

Patients can play a major role in helping to collect a medication list and ensuring that the list is kept up to date as patients visit multiple providers in the outpatient setting. Inform patients about this process, let them know how they can participate, and involve them in the design of the patient medication list. Encourage them to carry a list with them at all times and to update it with every change.

What is the role of the pharmacist?

In addition to ensuring appropriateness of doses and drugs, pharmacists can participate in the collection of the medication history. This role will vary depending on the availability of staff.

Looking for advice from other organizations like yours? Ask a Campaign Mentor Hospital!

The organizations on the [Campaign Mentor Hospitals list](#) have volunteered to provide support, advice, clinical expertise, and tips to hospitals seeking help with their implementation efforts.

What You Need to Know about Medication Errors: A Fact Sheet for Patients and Their Family Members

One of the most common types of medical mistakes has to do with medication errors – when patients take too many, too few, or the wrong pills. Medication errors can be very serious and lead to serious complications, admission to the hospital, or even death. The good news is that patients and family members can help prevent medication errors.

Many medication errors occur at “transition points” such as when patients enter the hospital, move from one room to another, or leave the hospital to go home. There are some ways you can help prevent medication errors at these transition points.

Make a list of all your medications:

You can help prevent errors by knowing about all the medications you take. But this can be hard to do. To help, make a list of all your medications. Then bring this list each time you see a doctor or nurse. Your medication list should include:

- Names of all your medications (include over-the-counter and herbal remedies)
- Dosage (how much you take of each medication)
- Time (when you take each medication)
- Ways you take each medication (such as a pill, patch, or liquid)

Keep your medication list up to date:

- Ask the doctor or nurse if your list includes all the medications you take now.
- Change the information on your list each time you start or stop taking a medication.
- Ask a pharmacist to review your medication list and make any needed changes.
- Make sure that the medications you are taking do not interact with one another. Ask your pharmacist for help if you aren't sure. You can also look on the Internet for websites that help you figure out what medications should not be taken together. One you may try is www.drugs.com.
- Try to use the same pharmacy for all your prescriptions and refills, so that your pharmacist can tell you about medications that you should not take at the same time.
- Throw away all medications you no longer take.

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Ways to use your medication list:

- Bring your medication list each time you go to the hospital, emergency room, or clinic.
- If you are too sick to do so yourself, ask a family member to show the medication list to your doctors and nurses.
- Make sure your family has your doctor's name and phone number. This way, they can help the hospital staff find out what medications you take.
- When you leave the hospital, talk with the doctor or nurse about the medications you will take at home. This is also a good time to ask why you need to take these medications.

Learn more about [Medication Errors](#).

Information provided in this Fact Sheet is intended to help patients and their families obtain effective treatment and help medical professionals in the delivery of care. IHI does not provide medical advice or medical services of any kind, however, and does not practice medicine or assist in the diagnosis, treatment, care, or prognosis of any patient. Because of rapid changes in medicine and information, the information in this Fact Sheet is not necessarily comprehensive or definitive, and we urge all persons intending to rely on the information contained in this Fact Sheet to discuss such information with their health care provider. Use of this information is at the reader's own risk.

Measurement

Measure compliance with each of the key components of evidence-based medication reconciliation. Document whether each component of care was provided or contraindicated; these are “process measures.” While improvements in individual measures indicate the processes surrounding those care elements have improved, improvement in actual patient outcomes requires improvement in all component measures.

IHI recommends the use of some or all of the following measures, as appropriate, to track your progress. In selecting your measures, consider the following:

- Whenever possible, use measures you are already collecting for other programs.
- Evaluate your choice of measures in terms of the usefulness of the final results and the resources required to obtain them; try to maximize the former while minimizing the latter.
- Try to include both process and outcome measures in your measurement scheme.
- You may use different measures or modify the measures described below to make them more appropriate and/or useful to your particular setting. However, be aware that modifying measures may limit the comparability of your results to others’.
- Posting your measure results within your hospital is a great way to keep your teams motivated and aware of progress. Try to include measures that your team will find meaningful and exciting.

Different strategies for collecting the data needed to calculate this measure are outlined in the Measure Information Form (MIF).

We recommend two process measures for medication reconciliation:

Process Measures

1. Percent of Unreconciled Medications

2. Unreconciled Medications per 100 Admissions

Outcome Measures

In addition to the process measures for each of the key components of medication reconciliation, we recommend measuring the **prevalence of adverse drug events** (patients with adverse drug events at a point in time) as an outcome measure. Prevalence is a widely used outcome measure for medication reconciliation, particularly in epidemiological studies.