Medication Reconciliation
A Program that Provides Good Medicine for Patients and Care Givers
Carol Belmont, RN, BES, MED
Linda Akpabio, CPhT, MAOM
Deborah Engles, RN, MS, CNAA-BC
Edward O’Hare, RN, MBA
Brenda Russell, RN-BC, MSN
Russell C. Richard, RN, MBA
Laura Waltrip, RN, BScN
Medication Reconciliation Defined
The medication reconciliation process is the identification of the most accurate and up-to-date list of all medications a patient is taking, at the time of admission, transfer, and discharge within the healthcare environment. This review includes the medication's name, dosage, frequency, and route of administration. Reconciliation involves the comparing of a patient's current list of medications against the clinician's admission, transfer, and/or discharge orders. If discrepancies are discovered at any point of reconciliation, these inconsistencies in patient information can be brought to the attention of the prescriber and, if appropriate, changes can be carried forward in the ordering process. Any resulting modifications in orders are documented for accuracy and consistency.

The Medication Reconciliation process is designed to enhance patient safety by involving three basic steps:

1. Verification of medication history
2. Clarification of medication names, dosages, frequencies, and routes of administration
3. Reconciliation documentation of recorded changes of identified medications

It should be noted that the prevention of Adverse Drug Events (ADEs) was the incentive behind creating medication reconciliation, a concept developed by Jane Justesen, a nurse at Luther Midelfort-Mayo Health System in Eau Claire, Wisconsin, as part of an IHI initiative.

Case for Medication Reconciliation
Modern medicine facilitates positive outcomes for millions of patients every day. However, inappropriate medication administration can erode life-enhancing benefits and lead to alterations in positive patient outcomes, especially in older patient populations and for those taking multiple medications.

Here are some startling statistics:

- The average American is 10 times more likely to be hospitalized from an adverse drug reaction than from a motor vehicle accident.

- Medication errors occur in nearly one of every five doses given to patients in the typical hospital setting. Adverse drug reactions (ADRs) cause more than 100,000 deaths per year in the U.S., making ADRs the fourth leading cause of death.
  Jason Lazarou, MSc; Bruce H. Pomeranz, MD, PhD; Paul N. Corey, PhD. Incidence of Adverse Drug Reactions in Hospitalized Patients: A Meta-analysis of Prospective Studies. JAMA 1998; 279:1200-1205.

- Administration errors account for 38 percent of medication errors.

- Only 2 percent of drug administration errors are intercepted.

- Safety at the point to care is one of the greatest areas for potential improvement in the medication use process.

The median compensation award for medication errors was $668,000 per award in 2000.

- It is estimated that the annual national costs of preventable adverse drug events is $2 billion.

- In America, 51 percent of all insured Americans (including children) take at least one prescription drug; 20 percent of insured Americans take three or more prescription drugs; 75 percent of older adults take one or more prescription drugs; 25 percent of older adults take five or more medications on a regular basis (28 percent of women and 22 percent of men).


Impact of Medication Reconciliation
The reconciling process has been demonstrated to be a powerful strategy to reduce medication errors as patients move through the continuum of care.

- A series of interventions, including medication reconciliation, introduced over a seven-month period, successfully decreased the rate of medication errors by 70 percent and reduced adverse drug events by 15 percent.

- In another study, the utilization of pharmacy technicians to initiate the reconciling process by obtaining medication histories for the scheduled surgical population reduced potential adverse drug events by 80 percent within three months of implementation.

- Successful reconciling processes also reduce work and re-work associated with the management of medication orders. After implementation, nursing time at admission was reduced by more than 20 minutes per patient. The amount of time that pharmacists were involved in discharge was reduced by more than 40 minutes.

Technology and Medication Reconciliation
Implementation of electronic medication reconciliation tools linked to clinical data, such as medications and, when possible, electronic medical record (EMR) data, has been shown to improve patient safety by reducing prescribing errors and virtually eliminating transcription errors. Additionally, electronic medication reconciliation allows access to various patient data in multiple
locations, which increases communication among all clinicians. By storing information electronically, clinicians can save time, reduce errors, and work to eliminate therapeutic duplications. Electronic medication reconciliation also allows for a standard formulary to be defined and enforced while a person is an inpatient.

Decision support tools may be incorporated into the electronic medication reconciliation software that provides an additional layer of support to the clinician. These tools can provide alerts to clinical staff to identify potential safety issues such as therapeutic overlap or interactions between over-the-counter (OTC) medications and herbs taken by the patient at home.

Collection of home medications to augment medications administered in the inpatient setting creates a more accurate list and allows for identification of duplicates or unnecessary medications by the clinician. Collection of medications may also offer insight for patient compliance or efficacy with home medications, especially long-term medications.

There are several key advantages that have been identified with the implementation of electronic medication reconciliation software, including, but not limited to:

- Ability to use electronic sources of medication information
- Better integration into hospital workflow
- Facilitated sharing of information across providers
- Automated documentation of discharge summaries
- Alerts and reminders for improving compliance
- Elimination of transcription errors

Before implementing an electronic solution, it is important to examine current paper-based medication reconciliation workflows to ensure you are not implementing any poor processes. Unless you investigate, analyze, and fully understand the issues surrounding paper-based medication reconciliation, technology can not compensate for problems in the current workflow. Given a well-designed and implemented technology solution, technology can provide tremendous support to the medication reconciliation process. For example, systems whose EMR allows a medication list to be downloaded from an electronic nursing documentation system onto a form reduce the time-consuming and error-prone process of manually completing forms. Similarly, at discharge, reformating the patient medication discharge profile from the pharmacy system into a prescription form can streamline the discharge prescription process. It can also be helpful to program the form so that it automatically converts medical abbreviations to patient-friendly directions, such as converting "BID" to "twice daily."

Currently, technology can most effectively support the medication reconciliation process of managing the continuity of care through transfers from unit to unit until discharge – such as providing automated medication profiles and medication records. The medication reconciliation process will be greatly enhanced by the ability to keep an electronic medication list for patients in the organization on local and network databases that allow for shared queries and enhance communication throughout the organization, therefore providing support for medication reconciliation.

Even though technology systems hold great promise for error reduction, without proper planning and implementation, errors can still occur. Complexities of the patient population and the healthcare environment require that technology be tailored specifically to address the treatment and the therapeutic dosing ranges of medications for the population. For example, systems designed for use with adult or geriatric patients may not adequately address the unique aspects of the pediatric population. Also, if the technology is not linked with other clinical systems, such as clinical documentation, the organization must find an efficient process for handing off information, including current medications to the next provider of care. This essential process cannot be ignored, as integrating disparate systems, such as clinical documentation and computerized provider order entry (CPOE), will result in generating a single-source electronic medication administration record for all clinicians, thus directly linking the ordering, dispensing, and administering stages in the medication-management process.

Other key considerations when implementing medication reconciliation technology include:

- Training
- Communications
- PC and device placement
- Support processes
- Cross-departmental impacts

**Required Components for Technological Software for The Medication Reconciliation Process**

The process should be able to deliver a full range of functionality in an integrated package that is easy to use and accurately reflects a real-world workflow. Specifically, it should offer the following:

**Easy data access**
Simple access to current, accurate, and complete patient medication data at any point during a patient’s hospital visit, including:

- Past medication history
- Current home medication list
- Any medications that have been administered during the current visit
- Modifications made to the home medication list during the current visit

**Medication identification**
Ability to quickly identify home medications when patients are unable to correctly identify the medications themselves

**Easy-to-use interface**
Simple ways for healthcare providers to quickly update patient medication history throughout a patient’s hospital stay

**Checks and alerts**
Quick duplication checks and adverse reaction alerts, including drug-to-drug interactions and patient drug-allergy notification

**Printouts**
Ability to quickly print an up-to-date medication list and instructions for each patient upon discharge

**Printed prescriptions and e-prescribing**
Printed prescriptions for the patient or electronic prescription transmittal directly to pharmacies
**Administrative ease-of-use**
Efficient, ongoing management capabilities

**Technical requirements**
An effective medication reconciliation solution also depends on certain technical capabilities, namely:

- Centralized, integrated application platform
- Automated interface between the medication reconciliation application and existing healthcare information systems (HIS)
- Automated and/or simplified links with external, recognized healthcare information sources
- Electronic prescribing capabilities
- Simple, intuitive graphical user interface that can be quickly learned by hospital staff
- Online workflow features that match up with typical, real-world hospital activities
- Built-in security features that meet HIPAA requirements
- Easy administration and maintenance, including simplified reporting
- Proven underlying technologies
- Reliable technical support

**Vendor technology platforms**
Vendors like Clinical Xpert (formerly MercuryMD) and Dr. First, as well as many others, have platforms for medication reconciliation. Such vendors have a well-tested platform that integrates data from existing information systems and securely delivers patient information directly to the desktop. They must also demonstrate clear evidence of reliability, durability, and high performance.

**HL7 integration**
HL7 data feeds from any compliant HIS provides instant information on medications ordered during previous hospital visits. Patient allergy data from the HIS is used to trigger onscreen alerts — such as drug-allergy (as well as drug-drug) interaction checking. By accessing past discharge medication orders, hospitals can reduce errors in creating the patient home medications list due to incorrect patient recall or second-hand information from friends or family. All vendor platforms should allow users to develop custom outbound integration solutions for most healthcare information systems, further enhancing efficiency and staff productivity.

**Automatic data feeds from external sources**
The vendor’s technology should allow for seamlessly and transparently integrating patient-specific prescription data from retail pharmacies and insurance plans into a patient’s medication history.

**Simplified drug identification**
Referential data links would permit an admitting nurse or other intake staff to quickly and accurately identify loose medications based on physical description, imprints, and photos. This further increases the accuracy of the home medication list and facilitates the intake process.

**Drug-interaction checking**
Interaction monitoring provides immediate onscreen alerts in case of conflicts, ensuring patient safety and enhancing the accuracy of the medication reconciliation process throughout a patient’s hospital visit.

**Comprehensive drug lookup information**
The technology to have “reference information,” allowing staff to quickly view extensive dosage, contradictions, and other drug information without having to launch another application.

**Automatic drug-allergy notifications**
Automatic alerts, based on information received from the HIS, enhance patient safety and the accuracy of the medication reconciliation process during a patient’s entire hospital stay.

**Built-in drug-duplication checks**
The system automatically checks for drug duplication (due to accidental or therapeutic error) and immediately alerts care providers accordingly. This capability further enhances patient safety, reduces errors, and helps streamline the medication reconciliation process.

**Integrated electronic prescribing**
Integrated electronic prescribing Care providers can choose to transmit prescriptions electronically to pharmacies, eliminating errors due to illegibility and avoiding unnecessary delays in getting medications prepared for patients.

**Customizable reports**
A variety of detailed reports should be available for tracking, analysis, and regulatory reporting purposes. Built-in reporting capabilities also simplify administration and reduce the costs and time involved in meeting reporting requirements.

**Easy-to-use Web-based interface**
Technology should include easy data entry and retrieval without extra steps or time and without annoying pop-ups. Intuitive prompts, data-entry fields, and common-sense menus and features that reflect the typical workflow process should be available.

**Ability to build and reconcile the home medication list**
When a patient first arrives at the hospital, admitting staff are required to assemble complete, accurate data on the medications that the patient is currently taking. This is a time-consuming procedure and seriously impacts the rest of the patient visit, as well as the post-visit experience upon discharge. From the medication reconciliation perspective, this has traditionally been the most difficult step in the process, since current manual and/or verbal methods for data gathering are highly error-prone and can lead to incomplete results that undermine patient safety.

Having the software technology to build a home medication list will help with the medication reconciliation process in a number of ways:

- Automatically displays detailed patient medication history
- Allows staff to add medication information manually whenever necessary (such as for custom compounds or over-the-counter medications)
- Permits quick drug identification
- Runs drug checking in the background, providing in-line notification of potential adverse drug interactions or patient allergies.
Reconciling — Once the home medication list has been created, the nurse or other authorized care provider should be able to simply click on a “Reconcile” button to view or modify the list and establish the medications the patient should be given while in the hospital. Options need to allow providers to continue, stop, modify, or add medications. This could be done with a simple point-and-click interface that makes it easy to view, select, and modify prescriptions, including dosage and frequency so that the entire reconciliation process becomes quick, intuitive, and flexible. The resulting list of medications becomes the inpatient or active medication list.

Saving and sign-off — When an authorized care provider revises the home medication list to create what will become the inpatient medication list, changes should be saved temporarily so that other physicians can participate in reconciliation at this initial stage. For example, a primary care provider will likely be reluctant to make decisions about medications related to a heart condition that is being treated by a specialist. This collaborative approach makes it much easier to share information about a patient in a way that ensures safety and maximizes the quality of care. The names of participants in this process are always displayed, so the full history of changes is obvious. Once it is clear that everyone who needs to be involved has made their changes, an authorized user can enter a secure password to sign off on the entire list.

Ability to maintain and reconcile the active medication list
As a patient moves from one point of care to another within the hospital, the active medication list must be repeatedly verified and reconciled at every transfer point. The procedure follows the same steps as the initial reconciliation, allowing physicians or other authorized users to view, modify, and confirm the medication list whenever necessary.

Ability to reconcile and print the discharge medication list
When the patient is ready to leave the hospital, staff must be able to generate an accurate discharge medication list for the patient and for any referred outside provider. Prescriptions must either be printed for the patient or transmitted directly to the patient’s pharmacy.

Software provided by many vendors can simplify the discharge process in a number of ways:

- Document reconciliation, which allows physicians and other care providers to indicate in the patient history which medications the patient should continue to take from their previous home medication list and which medications should be discontinued, modified, or added
- Provides the patient with a complete medication list, along with clear and comprehensive instructions
- Offers patients a convenient medication card
- Prints out prescriptions and can send prescriptions electronically to pharmacies
- Allows the hospital to notify outside providers of medication changes (via email)

Ability to map home medications to inpatient medications
Recognizing that a patient’s first reconciliation may occur following the placement of initial inpatient medication orders, users should be able to quickly “map” home medications to new inpatient medications. Vendor software should allow users to quickly move home medications to new inpatient medication orders by placing a “continue” or other notation in a column in the reconciliation process. This should also allow them to match home medications to the inpatient equivalent. This is accomplished by using clear indicators, such as check marks or icons, indicating the original source of the medication.

Compliant security
Medication reconciliation vendors should be HIPAA-compliant with solutions that meet and exceed measures outlined in HIPAA guidelines. IT systems need technical safeguards to help providers meet requirements as specified in Section 164.312 of the HIPAA Final Security Rule, which relates specifically to user authentication, access control, audit controls, encryption, integrity, and transmission security.

Implementation and technical support
Medication reconciliation solutions should have the following qualities to be successful:

- The system should use a database that can work with any health information system interface
- The information “access” should be via a “secure” exchange
- There should be a complete support system to address information processing
- The system should have limited or low “maintenance” to use and manage

In addition, a full range of client services and technical support options should be available to ensure that system implementation goes smoothly and that ongoing operations consistently meet expectations for performance, ease-of-use, and reliability.
Benefits
Medication reconciliation can help reduce the high costs associated with ADEs, while significantly enhancing patient safety. By improving communication among hospital staff, medication reconciliation can also improve efficiency and productivity. In addition, the solution provides an effective method for complying with Joint Commission mandates, providing easily captured documentation of the medication reconciliation workflow and reporting mechanisms that match up with Joint Commission requirements.

Barriers to Implementation and Adoption of a Medication Reconciliation Program
View of the medication reconciliation process as additional work
Developing the forms (paper or electronic) and the personnel workflow to ensure that the process is completed consistently, efficiently, and in a timely manner with each patient transition (i.e., admission through discharge) requires time and an initial learning period. However, there is little imagination required to realize how reconciling medications will ultimately save clinicians time at all levels while significantly reducing risks. Completing the medication reconciliation process reduces the opportunities for medication errors and the associated adverse events that can accompany the error and potentially lead to patient harm.

It isn’t just a physician’s/clinician’s job
The reconciling of medications is a team effort. All disciplines must be involved and complete portions of the process, although the final medication orders rest with the physician.

The fear of change
Change can be difficult to manage and adopt. However, the importance is obvious as many clinicians interviewed replied that collecting the appropriate medication history and ensuring that admitting orders reflect the appropriate therapies are essential to decreasing medication errors and rework. The framework suggested by IHI and the Massachusetts Coalition for the Prevention of Medical Errors are two guidelines that can assist in building consistency and efficiency into the process.

A breakdown in communication
Organizations that have not been successful in the change and adoption of the medication reconciliation process have not succeeded (as one contributing factor) in communicating with staff members at all levels the importance of the reconciling medication process. Additional contributing factors are the requirement for ongoing reinforcement of the process change, which includes continuing education and training of staff members to boost participation and buy-in.

Partial buy-in by physicians and staff members
In order to obtain cooperation and connect with staff, it is important to develop and distribute baseline data as to how reliable and efficient the existing workflow process is in reconciling medications. As an organization researches and develops a process for medication reconciliation at each patient transition point, the implementation team must find ways to simplify and standardize, resulting not only in decreased medication errors but also in increased reliability, efficiency, and staff satisfaction. Accountability for each phase of reconciling a patient’s medication list, at each transition point, must be assigned.

Core recommendation for medication reconciliation implementation and adoption
Adopt a systematic approach to reconciling medications, starting with reconciling at admission and continuing through the patient continuum of care until discharge.

Collect complete and accurate pre-admission medication lists
• Collect a complete listing of current medications (including name, dosage, frequency, and route) for each patient on admission
• Validate the pre-admission medications with the patient (or with patient’s care giver when possible)
• Assign primary responsibility for collection of the pre-admission list to a clinician with sufficient expertise, within the context of shared accountability

Write accurate admission orders
• Use the pre-admission medication listing when writing new orders
• Place the reconciling form (see: “Provide continuing support and maintenance” below) in a consistent, highly visible area within the patient’s chart

Reconcile all inconsistencies
• Assign primary responsibility for identifying and reconciling inconsistencies between the pre-admission medication listing and new admission orders to a clinician with sufficient expertise
• Reconcile patient medications within a pre-defined time frame

Provide continuing support and maintenance
• Adopt a standardized form to be utilized for collecting the pre-admission medication listing and reconciling of inconsistencies
• Develop a clear set of policies and procedures for each step in the reconciling process, both at admission and across the patient continuum
• Provide responsible parties with responsibility/accountability for reconciling medication lists, the access to drug information, and pharmacist advice through each step of the reconciling process
• Improve clinician access to complete medication lists at admission, transfer, and discharge
• Provide orientation and on-going education around standardized procedures for reconciling medications to all healthcare providers
• Provide feedback and ongoing monitoring through an approved audit process

It should be noted that while the information above primarily focuses on the reconciling of medications at admission, the same watchfulness, observation, and awareness should take place at all critical patient transition points.
Frequently Asked Questions about Medication Reconciliation

The Process

Who should be responsible for owning and completing the reconciliation process?
Reconciliation is the responsibility of the nurse, the pharmacist, and the physician, as each has a role or an action to perform in the process. The responsibility for the collection and review of the medication history may differ within each institution based on a resource’s expertise and availability at each patient transition point. At a minimum, there should be an expectation that physicians utilize medication lists during the writing of admission, transfer, and discharge orders and to communicate with nursing and pharmacy when those orders differ from a home medication list.

When should reconciliation occur?
Reconciliation should be completed as soon as possible after the patient has been admitted and entered into the patient care continuum. Because there may be challenges in the collection process of the medication list at the time of admission, for example, on the night shift, the facility should have a contingency plan where medication information is collected on medications that may be needed prior to the day shift. Once a complete list has been compiled, workflow process should be developed to ensure that the completed list is made available when the admission orders are written. Also, reconciliation should occur at patient transfer and discharge. A good rule of thumb is that reconciliation of medications should occur where orders are discontinued and new orders are written.

What medications should be reconciled?
All medications should be reconciled, regardless of whether they are prescription/home medications, over-the-counter medications, alternative/herbal medication or supplements, or homeopathy remedies.

Can the reconciliation list be utilized as an order form?
Some organizations have developed medication lists that can be leveraged as an order form. This may include check boxes to indicate if the medication should be continued, discontinued, or undergo a dosing change. Others have elected not to use such lists as an ordering form as this process may introduce opportunities for process errors if not developed and/or preformed correctly. Organizations should also review their internal policies for updating as needed and periodically check state and federal regulations to ensure compliance and patient safety.

How is reconciliation carried out and completed at patient transfer?
Policy and procedure development should center on the premise that a medication schedule will be changed or that medications being discontinued and/or changed to dosing schedules will affect the patient treatment plan.

As orders are placed at transfer, the prescriber should review the patient’s medication history and their list of current medications before progressing in the transfer and the placement of new orders. In the communication process regarding which medications are to be discontinued, organizations have developed processes similar to those employed at admission to ensure continuity of the continuum of care and not to implement separate workflows at separate transitions points/areas. The goal is to ensure that the prescriber process is fluid at each transition point, that the process doesn’t fluctuate from one transition point to the next, and that patient medication information is readily available and in the same consistent area within the patient’s record.

How is reconciliation carried out and completed at patient discharge?
Prior to placing the discharge orders, a review and comparison of current medications with those on the medication list collected at admission should be completed. This review is to make certain that home medications are restarted, or discontinued, where appropriate. The goal is to ensure that home medications are restarted when necessary, that therapeutic duplication is avoided, and unnecessary medications are discontinued.

The Medication List

There are often two “initial” medication lists: What the doctor prescribed and what the patient is taking at home. So, which should be considered the correct baseline?
Both. This is why reconciliation is needed. In some cases, neither list may be completely correct. Both lists should be leveraged as a source of patient data toward development of a correct/complete patient medication list.

Should medication reconciliation be started in the emergency department (ED)?
Yes. A review and collection of medications toward completion of a medication list is essential, regardless of whether the patient is admitted or not. During the patient’s stay in the ED, they may receive medications that could interact with those they are already taking at home.

If a medication list can’t be obtained from the patient or their family, should there be a process for obtaining this information from the patient’s physician office?
This can be a challenge and is dependent on how physicians in the community are aligned with the organization. As part of a medication reconciliation review and implementation, community physicians should be included in a process plan for the collection and verification of patient home medications where the initial admission medication data collection may be incomplete, difficult, or impossible to obtain.

Stakeholders

Should physicians be engaged and how?
Physicians are members of the healthcare team and have primary responsibility for placement of the admission orders. The process of medication reconciliation should be developed and implemented so as not to add complexity into the clinicians’ workflow. It should be planned to decrease rework, eliminate duplication, and fit into the natural workflow of all staff members. To assist with adoption early in the design/redesign effort, share information with staff on how the new process for medication reconciliation can assist in decreasing errors and the potential harm a patient may experience as a result of these errors. It is essential that all staff understand the goals to be achieved and how the process was developed and designed.
We are getting a lot of push-back and resistance that the process of medication reconciliation will add to a staff's workload. How do we work through this challenge/barrier to change with our clinicians? The process of instituting change should be open and viewed as a new (and better) way of performing and completing daily tasks/workload. Reconciliation is a process that should occur for all patients for whom medications are ordered and administered. By reviewing current workflows and designing new ones that fit into the daily routines and flow of patient care, staff members will be more likely to accept and adopt the new practices and increase sustainability across departmental areas.

What role does the pharmacist play?
Pharmacists can contribute at any point along the patient continuum. They can collect medication histories, verify suitability of prescribed medication at admission and transfers (by dosing and frequency regimes, appropriateness for age and gender, drug-to-drug interactions, and allergy verification), and/or review appropriateness of prescribed medications at discharge against a patient medication list. The exact methodologies to involve pharmacists would be dependent upon the design of the reconciliation workflow and the availability of staff at each transition point.

Can patients be involved?
Patients and patient’s families can play a crucial role in the collection and development of the medication list. Teaching the patient the importance of maintaining their own personal list and ensuring that their personal medication list is kept up-to-date will assist during the intake process of the patient into a healthcare setting and can have broader implications in the community as that patient maneuvers through the outpatient setting.

Review of Medication Reconciliation Implementation Process/Tips and Tricks/Best Practices
Below are a number of best practices identified by the many institutions that have contributed their findings to the 100,000 Lives Campaign sponsored by IHI.

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 brings to the surface defects in the existing medication system. Determine how many existing safe practices should be in place 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 all situations.
- Do not let “waiting to develop the perfect system” slow you down.
- Be aware there may be additional work for 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 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 facility.

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 those 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.
- Develop a standard interview sheet (paper or electronic) to improve the information collected.
- Segment patients. For instance, collect medication histories from pre-op patients during pre-op screening. One process may not work for all patients.
- In all cases, interview the patient to confirm the dose and frequency for each medication the patient is taking.
- If a patient has a caregiver, interview the caregiver to obtain a medication history.
- Clarify responsibilities for completing this process.
- Collaborate with other healthcare facilities to develop a common format for a patient’s own medication list.
- Engage patients. Inform them of the importance of carrying medication information with them as they visit different care providers.

Tips for streamlining the process on patient admission:

- Incorporate the medication history into existing forms (paper or electronic).
- Determine if the medication history form can be used as an order form.
- Use technology to enter patient information into an EMR.

Tips for completing medication reconciliation on patient transfer:

- Identify when Medication Reconciliation applies:
  » Any time the organization requires orders be written
  » Any time the patient changes service, setting, provider or level of care and new medication orders are written.
  » For transitions not involving new medication or rewriting of orders, the organization determines whether reconciliation must occur.
- Develop policies and procedures to guide staff.
- Ensure 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 utilized as discharge orders.
- 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 visiting the ED:

- Determine if medication reconciliation applies.
- Differentiate the need for a medication history and medication reconciliation.
- Segment the patient population. One process may not work for all patients.
- Review The Joint Commission description of “minimal medication use.”
- Adopt one form (paper or electronic) 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.
Examples of Medication Reconciliation Process Workflows

Note: The process workflows shown below are meant to initiate the conversations required for implementing the medication reconciliation process – they are not meant as a final example of best practices. Discussions should include, but are not limited to: all stakeholders in the process (as previously reviewed above), a review of current practices and regulations, policies and procedures, goals and benefits to be achieved, assignment of responsible parties to each trigger and/or handoff point, etc.

**Medication Reconciliation Admission Process – Non CPOE Environment**

**Decision: Are additional admission medication orders to be written?**
- **YES**
  - Physician writes admission medication orders (in paper chart)
  - Update medication reconciliation form (with physician admission medication orders)
  - Place completed form into patient’s chart
  - Medication reconciliation at admission complete
  - Patient Transfer (Inhouse)
- **NO**
  - Decision: Should current home medications be continued?
    - **NO**
      - Physician writes admission medication orders (in paper chart)
    - **YES**
      - Decision: Are additional admission medication orders to be written?
  - *Initial documentation of medication reconciliation (of home medication) to be reviewed against admission orders and updated as appropriate
  - *Clinic with the appropriate skill set should be assigned responsibility to carry out process

**Key Decision Points**
- *Trigger to initiate medication reconciliation process
- *Responsibilities of clinicians at each process point are reviewed and determined
- *Stakeholders to be included in discussion and decision process
- *Whether patient chart is all paper or a hybrid of paper and electronic, what are the gaps between current and future states?
- *Where will the reconciliation form be maintained in the patient’s chart (for ease of accessibility to all appropriate clinicians)?
- *Above is not all inclusive...
Medication Reconciliation Transfer Process – Non CPOE Environment

*Transfer can be defined as a change in patient acuity level, change in primary physician, and/or change in service – dependent upon facility policy & procedures

Patient Transfer (Inhouse) → Decision made to transfer patient → Physician (and/or other appointed responsible clinician) reviews medication profile → Decision: Per facility policy & procedures, is this an appropriate process point for the revision of patient medication orders?

**YES**

Physician (and/or other appointed responsible clinician) reviews current active orders

**NO**

Physician (and/or other appointed responsible clinician) determines appropriateness of current orders and the requirement for changes to and/or new medication orders

New transfer medication orders completed

Responsible clinician with appropriate skill set updates medication reconciliation form, with transfer medication updates

Transfer of medication reconciliation process complete

*Medication reconciliation documentation should be placed in easily identifiable areas for all-clinician accessibility

**Key Decision Points**

*Trigger points to initiate reconciliation process
*Responsibilities of clinicians at each process point are reviewed and determined
*Stakeholders to be included in discussion and decision process
*Whether patient chart is all paper or a hybrid of paper and electronic, what are the gaps between current and future states?
*Where will the reconciliation form be maintained in the patient's chart (for ease of accessibility to all appropriate/required clinicians)?
*Above is not all inclusive...
Medication Reconciliation Discharge Process – Non CPOE Environment

Key Decision Points
*Trigger points to initiate reconciliation process
*Responsibilities of clinicians at each process point are reviewed and determined
*Stakeholders to be included in discussion and decision process
*Whether patient chart is all paper or a hybrid of paper and electronic, what are the gaps between current and future states?
*Where will the reconciliation form be maintained in the patient’s chart (for ease of accessibility to all appropriate/required clinicians)?
*Above is not all inclusive...

Appropriate clinician with the appropriate skill set reviews patient discharge orders, discharge medications, and patient’s personal reconciled medication list with patient, prior to discharge

End of workflow process
Conclusion
Medication reconciliation is an essential process for ensuring high-quality and safe medical care. An accurate, validated, up-to-date patient medication list is vital in all healthcare settings. Implementing common practices of comparing what is being taken in one setting with what is being prescribed in another will avoid errors of omission, drug-drug interactions, drug-disease interactions, and other discrepancies. The reconciliation process is a major component of patient safety in any environment and across all continuums of care. As identified in this paper, the challenges in developing and implementing a reliable and sustainable process of communicating current medication information across the patient continuum are complex. However, the rewards are so great that significant efforts should be spent to ascertain, document, and manage this information.

Don Levick, M.D., M.B.A., is the medical director of clinical informatics; Sandra Haldeman is the director of clinical applications; and Michelle Beck, M.B.A., is the manager of clinical applications for Lehigh Valley Health Network.

Additional References
Luther Midelfort – Mayo Health System Eau Claire. Medication Reconciliation Review; Wisconsin, U.S.

Committee on Identifying and Preventing Medication Errors, Board on Health Care Services (Institute of Medicine of the National Academies, 2007). Preventing Medication Errors.

For more information about any of our service offerings, please contact your Dell representative or visit dell.com/services.