Guidance for Medication Reconciliation and System Integration Process

Identifying points of failure within the medication reconciliation process and determining systematic approaches (via health IT) to overcome barriers

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INTRODUCTION

Medication reconciliation is the process of transferring information about a patient’s current medicines and therapies as part of a “handoff” between caregivers (e.g., day shift nurse to night nurse, or resident to attending), care areas (e.g., transferring from ICU to step down), or care settings (e.g., discharge from a hospital to long term care, or as part of the hospital admission process). A key component of medication reconciliation is to have an accurate list of medications to begin with. Failures in medication reconciliation can lead to a patient getting delayed or wrong treatment, and IT solutions can reduce these failures through availability and integration. Availability means that correct information is available in real time in at least one electronic system. Integration means that a patient’s information can be sent in a useable format from one information system to another.

Right now, many facilities are moving to electronic health and medication records in an attempt to improve care, and such efforts can improve medication reconciliation between caregivers and care areas in a single institution. However, implementation of health IT systems is challenging at best, and integration between information systems in different care settings is virtually nonexistent to date. In the absence of well-implemented and well-integrated health IT systems, the patient (or a designated caregiver like a parent, spouse, or friend) is ultimately responsible for providing an accurate list of current medications, including doses and administration schedules.

In order to help facilities plan for and execute a successful implementation of health IT in the area of medication reconciliation, the HIMSS Medical Devices and Patient Safety Task force has written this Guidance Document to

1. Educate readers about the causes and effects of failures in the medication reconciliation process through an example
2. Provide advice on administrative, clinical, and technical approaches to reducing potential failure modes
   a. Pre-start checklists for building a project team

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b. Key technical questions to ask the vendor before purchasing an integration solution for medication reconciliation

c. Key clinical questions to ask the vendor before purchasing an integration solution for medication reconciliation

FAILURES IN MEDICATION RECONCILIATION DESCRIPTION: AN EXAMPLE

Medication reconciliation hand-offs can be troublesome, particularly when several care settings are involved. Right now, with little coordination between care settings, the patient is required to act as the care coordinator, sometimes with disastrous results. To illustrate the complexity of the medication reconciliation process, we provide an example of one failure mode in one type of care transition. As you read through, consider how many care transitions your facility will need to think about, like orthopedic office to pre-surgery; hospital to clinic; hospital to long term care, emergency department to community (retail) pharmacy, and so on. Each type of care transition may exhibit different potential failure modes, and each may need a different IT solution.

Consider Mary, a 68-year-old woman with type 1 diabetes and high cholesterol who is living by herself. Mary's care team includes her primary care practitioner who prescribes medication for allergies and periodic ailments like sinus infections, a cardiologist who keeps an eye on her blood pressure and has prescribed a statin to lower her HDL, and an endocrinologist who monitors her diabetes and prescribes a long-acting insulin. For a few years, Mary has coordinated her PCP, cardiologist, and endocrinologist, but then she falls ill with a bad flu.

Mary is taken to the ED of a local hospital by her neighbor, and Mary's blood sugar rises while she's in the ED due to stress. The ED attending writes an electronic prescription for a short-acting insulin along with some fluids and pain medications, and makes the decision to admit Mary to the ICU. In the ICU, Mary tells the resident that she has type 1 diabetes, and she is prescribed a long-acting insulin. However, the hospital stocks a different version than the one Mary uses at home.

When Mary is discharged, she's given a prescription for the long-acting insulin she's been on in the ICU, which she fills at the hospital's outpatient pharmacy. When she gets home, she takes her 'usual' long-acting insulin as well as the new one she picked up from the outpatient pharmacy, and develops diabetic shock.

In an 'un-connected' world, Mary is responsible for asking both the ICU resident and her endocrinologist which medications to take when she gets home. However, electronic information exchange between the care settings and pharmacies could have caught the two active insulin prescriptions and alerted all caregivers.
What does this example teach us?
In the figure above, mapping out the process and workflows associated with this patient story shows us a wide variety of opportunities for failures in medication reconciliation, some of which could be ameliorated with health IT systems. In the list below, we identify potential failure points and mark those that could benefit from a well-implemented and well-integrated health IT system.

Examples Potential Points of Failure

- History failure point – error occurs when taking the medication history
  - Patient nondisclosure
    - Patient unable to speak*
    - Language barrier*
    - Unconscious*

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- Patient can’t recall medications and/or dosing*
- Family can’t recall medications and/or dosing*

- Mismatch
  - Patient/family provides information on medications prescribed but patient does not comply with prescription
    - Knowledge deficit*
    - Costs*

- Translation failure point – error occurs when translating what patient describes as medications and dosing into correct medication and dosing*

- Reconciliation failure point – error occurs when writing/inputting orders
  - Insufficient clinician knowledge on med rec*
  - Error occurs when writing/inputting orders*
  - Medication not available

- Handoff failure point – error occurs when transmitting medication information from one setting to another
  - Time constraints*
  - Insufficient communication*
  - No reminder to perform med rec*

*where technology can assist

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**ADMINISTRATIVE TOOLS: BUILDING YOUR IMPLEMENTATION TEAM**

The composite makeup of the implementation team is critical to ensure successful project development and implementation. It is important to note that gaining input and feedback from the clinical stakeholders helps ensure that the end product not only meets technical requirements, but also provides the expected patient care value. To that end, please consider the following as you are developing your team:

- **Project Management:** recruit a project leader that is proficient in project leadership, experienced in using project management tools, and is an excellent communicator.

- **Executive Leadership:** It is important to recognize that having a physician champion on your team pays handsome dividends. Not only will you gain the functional expertise of their patient care experience and professional guidance, but also the physician champion provides a conduit to physician peers. This can be valuable in communicating to, or soliciting feedback from, your general physician population, but also in gaining that peer to peer report that may be needed with some physicians as you implement your processes. Also consider including a leader at the executive level on the team. When there are difficult situations or decisions, your executive can help provide leadership.
guidance at that level, and also can communicate with the entire executive leadership team as needed or required. You will find that there is great synergy to be gained when pairing up an executive leader with a physician champion when working through a large project that involves multiple stakeholder groups.

- **Clinical Perspective**: Clinical resources to consider would include Nurses (both floor nurses, and nursing leadership) and Pharmacists. Also, seek the involvement of your clinical engineer or clinical informaticist. They can provide that bridge between the functional and technical worlds of patient care. They can “speak” and understand the clinician language, but also usually have a keen sense of technical direction.

- **Technical perspective**: Many different IT professionals may be required for the team - IT integration specialists, network engineers, database analysts, client or server resources, and hardware specialists. In addition, the biomedical engineering team needs to be represented, as they typically manage the medical devices. Your needs may vary depending on available resources.

Finally, remember to include vendor or consulting partners as appropriate. They can assist in filling gaps or voids in team strengths, or may already be a ready resource to the organization in varying capacities.

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**ASSESSMENT AND PLANNING TOOLS: KEY QUESTIONS**

Vendors play a key role in a successful implementation of health IT. Before you purchase a system, there are key questions that you need to ask of your vendor.

**From a technical perspective:**

- Ask your EHR vendor what systems they have had the most successful implementations with
- What intellectual property rights do you have around the data?
- Ask the infusion pump vendor to show you de-identified data and what it looks like when it is actually downloaded into the flowsheet, e.g., what data will be available
- How is the data displayed?
- How do you reconcile a rate change? If a nurse changes the rate, how is that reconciled?
- What software do you use?
- Show me a site that uses the same infusion pump and same software with the same EHR that your hospital is using.

**From a clinical perspective:**

- Ask the vendor to demo the process.
• Does the product have all required/desired features of med rec? Does it identify and alert clinicians to errors of omission, duplication, contraindication, dose, frequency, and form?
• Does the product have the ability to electronically compare two or more medication lists (e.g., between an externally provided medication list and the current medication list)? (possibility for Meaningful Use Stage 2)
• Does the product use standard terminology, such as RXnorm? (likely > required in Meaningful Use Stage 2)
• Patients are suppose to receive medication reconciliation upon discharge from hospital - how does the product accomplish this? Patient preference? Print? Email? Is it in terms and language patient can readily understand?
• Does the product produce and transmit electronic prescriptions for patient discharge?
• Does the product produce patient education materials and in what format (printed, email, etc.)?
• Is this a bolt-on application and if so, how many interfaces will be required?
• Does the product contain or interface with any formulary (if so, which one)?
• How does the product handle formulary changes?
• How does the product handle drug substitutions related to drug shortages (does it offer recommendations)?
• Does the product have automated reporting for mandatory immunizations?

SUMMARY

Medication reconciliation, if done correctly, can be an extremely complex undertaking. With advances in medical technology, and standardization of connections, interfaces, and functionality, the sheer amount of electronic data alone to manage can be daunting. There exists a need to marry electronic data and manual processes to provide a comprehensive analysis of medications for the patient. Often times that coordinating effort fails to take into consideration all factors required for that accurate, overall view.

While it would be difficult to document all possible scenarios that a medication reconciliation effort could encounter, this guide attempts to discuss the most significant considerations – those that could have a dramatic effect on the patient’s hospitalization experience, and post-acute care.

Finally, it is important to note that as medical technology continues to advance and evolve, an accurate medication reconciliation process remains a critical step in the safe care of the patient. It is our role as providers of patient care to leverage the power of the currently available technology and to constantly assess our medication management processes to help ensure that the patient always receives care in the most accurate and safest method possible.
References


2. The following references cover use of the risk assessment questions and actions (Section 2.3), root cause analysis (RCA), (Section 2.1) Failure Mode and Effects Analysis (FMEA), (Section 2.2). flow diagram or a case scenario (Section 2.4)