SCOTTSDALE INSTITUTE

INSIDE IE EDGE

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Medication Reconciliation

EXECUTIVE SUMMARY

Medication reconciliation, or "med rec" as it is often called, encapsulates all the promise and pitfalls of IT-enabled process improvement. Notwithstanding its specialized niche, med rec spans the continuum of care, from home to doctor's office to the most critical care unit in the hospital. It relies on a wide perspective also in the collaboration required by the care team and its need for a comprehensive view of a patient's medications, whether prescription or OTC remedies. It demands accurate, timely and seamless information that requires workflow and culture change.

The Joint Commission has mandated that each hospital develop a system for reconciling a patient's medications at admission, transfer points and discharge. That means accounting for and maintaining a continually updated list of all the medications a patient is on as she travels through the hospital. Patient safety depends on it. Take the example of one health system whose experience is reported on the Institute for Healthcare Improvement's website. Mayo Health System in Eau Claire, Wis., found that medications not reconciled at transition points could account for as many as half of all medication errors and one in five of ADEs in the hospital and subsequent outpatient settings. The data spurred the health system to develop a reconciliation tool and implement process-improvement change that helped it reduce potential and actual ADEs. [For more detailed information visit www.ihi.org and under Topics click Patient Safety, then Medication Systems and then Improvement Stories.]

The following is our effort to take a snapshot of med rec today from as many different perspectives as possible, including providers, advocates, vendors and consultants. While it's tempting to say that if you've seen one med rec system you've seen one med rec system, there's enough collective wisdom accruing in the industry we think to advance the ball down the field, as painful as the process may seem today.

Heroic efforts

"Hospitals are really struggling with medication reconciliation," says David Troiano, RPh, MSIA, a senior manager specializing in the medication-use process at consultancy CSC. "They haven't been able to put in processes and systems to do it well and efficiently," he says. Part of the problem is that IT vendors have been slow to develop med rec applications that address both the complex workflow needs of med rec and the basic need for accurate and timely information.

The Joint Commission's mandate covers admission, changes in level of care and discharge, but that leaves a lot of ambiguity for the ambulatory environment,

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WELCOME NEW MEMBER

The Scottsdale Institute is proud to announce BayCare Health System based in the Tampa Bay area as a new member.

BayCare was formed in 1997 when the leading not-for-profit hospitals in the Tampa Bay area came together, united by a common mission to improve the health of all they serve. It currently has 9 hospitals, 11 ambulatory/outpatient centers, 2,707 beds and over 17,000 employees.

BayCare is a joint operating agreement between three Community Health Alliances (CHAs). Each CHA focuses on the distinct needs of their community and taps into the regional system for improved quality, better access and greater efficiencies. BayCare's CHAs are:

- Morton Plant Mease Health Care, which includes Mease Countryside Hospital, Mease Dunedin Hospital, Morton Plant Hospital in Clearwater and Morton Plant North

continued on next page

he says. "So, lots of people have made lots of heroic efforts, but the challenges remain, the most basic of which is that good information is not readily available. One of the biggest struggles is simply getting a single source of accurate information about a patient's medications in a timely manner." That's an issue exacerbated by the fact that patients have notoriously poor memories regarding when they last took a drug or what the prescribed strength was. Complicating the issue is that patients tend to visit multiple physicians and pharmacies.

David Troiano, RPh, MSIA, senior manager, CSC, Falls Church, Va.

"It's part of the larger symptom of the healthcare system: fragmentation of information," says Troiano. Add to this the fact that doctors don't want to take the time to do med rec because there's no direct incentive for it. And when a patient is admitted to the hospital (inpatient or outpatient) by specialists—specifically for a procedure—these medical specialists are ill-equipped to understand that patient's overall medication regimen. So, what happens is that a combination of nurses, pharmacists and sometimes dedicated hospitalists assume the responsibility for med rec by default.

View from an HIS vendor

Stacey Gray, RPh, a pharmacy strategist for Cerner Corporation and veteran observer of all aspects of the medication management process, says pharmacy IT got a head start on other departments in the 1980s and, as a result, most organizations are today in their third or fourth rendition of a pharmacy information system. "Pharmacists use a computer system that's much more sophisticated, much more interactive even than CPOE," he says. That kind of sophistication is finally being brought to bear on the medication reconciliation process, a necessarily more complex aspect of the medication process.

Gray breaks med rec into three phases:

- Documenting accurately what a patient is on;
- Linking that information to what the physician wants the patient to be on;
- Communicating that information to other care givers, including nurses and others involved in the care process.

"The key point is to look at all the players involved—it's really multiple people—and at any time a patient 'transitions' in care," says Gray. Those transitions can occur from outside to inside a hospital, from one level of care to another within the hospital—from the ICU back to a regular care unit or from a care unit to the OR, for example—or a visit to their doctor's office. "The walls between inpatient and outpatient and retail pharmacy are just evaporating. The medications that a patient is taking transcend that whole picture," he says.

"Any time a patient takes a new over-the-counter medication that's a change that can dramatically affect their overall profile. There's a level of complexity in

medication reconciliation that is the reason why organizations are struggling," says Gray. "The Holy Grail of medication reconciliation and good outcomes is an accurate and up-to-date list of medications and the patient accurately taking them as directed. That's much, much more complex than it sounds."

Adding to the challenge is the fact that the Joint Commission has had a difficult task in interpreting its proposed patient safety goals related to medication reconciliation. While not surprising given the evolutionary nature of the rules—not only do they change over time based on feedback from hospitals, different commission inspectors can emphasize different things—that further complicates the issue of just how hospitals are to go about implementing medication reconciliation. "The definition of med rec morphed. Everyone's understanding of the med rec process morphed. Who shoulders the responsibility morphed," says Gray.

Physicians were the ideal executors of med rec according to The Joint Commission's original model, but physicians have pushed back because of the time demands. That has resulted in two models, one in which the physician reconciles the medications and another in which the RN or pharmacist does it prior to administration.

Whatever model, examining the process makes it clear that when a patient comes into the hospital, someone has to take a medication history—and that requires a special combination of clinical knowledge and emotional intelligence. "There's an art to communicating with patients," says Gray, who has himself taken about 18,000 medication histories. "You don't ask a person what OTC drugs they're taking. It's too hard to remember. It's better to ask, 'What medications do you first take when you have a headache?' Then, 'How often do you get headaches?' You also need to ask how many pharmacies they go to. Pharmacists are typically the most accurate at taking medication histories," he says.

So why not just turn the job over to pharmacists? According to Gray, a shortage of hospital pharmacists makes them too costly a solution under the current industry mindset. The result, based on research, is that med rec is more time consuming for nurses and physicians, and they are less accurate, partly because they lack the pharmacist's specialization and are besieged by myriad competing priorities. There are thousands of new drugs on the market and pharmacists have an intimate knowledge of those drugs, which enables them to better interpret what the patient is communicating.

You can't overestimate the importance of the first step. A patient coming into the hospital might easily be seeing five doctors including specialists. The IT aspect is both beneficial and problematic. "An accurate medications list is a living document that needs to be updated continuously. If not, this has great potential to create medication administration errors," says Gray.

"The real aspect that gets lost is that if you do it right once at the beginning it saves an enormous amount of rework and errors. Are we adding time at the beginning and transitions of care? Yes, but the tradeoff is higher as patient safety

Welcome continued

Bay Hospital in Pasco County.

- St. Anthony's Health Care, which includes St. Anthony Hospital in St. Petersburg.
- St. Joseph's-Baptist Health Care, which includes St. Joseph's Hospital, St. Joseph's Children's Hospital, St. Joseph's Women Hospital in Tampa and South Florida Baptist Hospital in Plant City.

Other regional health services are: BayCare HomeCare, BayCare Laboratories, BayCare Life Management, BayCare Occupational Health Services and The Harbor Behavioral Health Care institute.

Welcome Stephen Mason, president and CEO, Lindsey Jarrell, SVP/CIO, Bruce Flareau CMIO, Cynthia Davis, VP, Clinical Transformation and the entire BayCare team.

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June 10
Management Dashboards: The Memorial Hermann Daily Flash Report
- Emily Handwerk, system executive, Information Systems, Memorial Hermann Health System, Houston

June 11
E-Discovery Rules of the Road: New Data Retention Policies and Practices
- Ronald Bonig, VP and CIO, The George Washington University, Washington, DC
- George Conklin, VP and CIO, CHRISTUS Health, Irving, Texas
- Evelyn Briggs, information management director, Security and Compliance, CHRISTUS Health
- Nancy Poblenz, Esq, CHRISTUS Health

June 17
Standardizing Vocabularies and Creating the Governance Structures to Manage and Maintain Them
- Christopher Chute, MD, DrPH, professor and chair, Biomedical Informatics, Mayo Clinic, Rochester, Minn.

June 23
Sharp HealthCare Baldrige Award and IT Enablers
- Bill Spooner, VP and CIO, Sharp HealthCare, San Diego
- Nancy Pratt, SVP, Clinical Effectiveness, Sharp HealthCare

more events on next page

is greatly improved," he says, adding that the most successful organizations trigger process and culture change and use appropriate technology—knowing that technology itself is not enough. "The one critical limiting factor in medication reconciliation is time," he says.

Clearly, medication reconciliation calls for teamwork, specifically a pharmacist/nurse/physician team to create as efficient a process as possible. "We're seeing more collaboration across the healthcare team. The C-suite can have an enormous impact on the level of collaboration. Medication reconciliation really highlights room for improvement in collaboration inside the medication-use process," says Gray.

That could include someone prior to the physician's entry creating a clean list of medications. "I see more and more pharmacists moving into the role of taking a patient's medication history," says Gray.

ISMP

The stakes continue to be high. Stu Levine, PharmD, informatics specialist at the Institute for Safe Medication Practices (ISMP) in Horsham, Pa., cites a litany of studies driving the med rec movement forward:

- Of 151 patients on at least four medications, 53 percent had at least one unintended discrepancy (Cornish, et al, Arch Intern Med 2005;165:424-429);
- One in five patients suffered an adverse event in transition from the hospital to home (adverse drug events were the most common at 66%), and 62 percent of those were preventable (Foster et al, Ann Intern Med 2003;138;161-167);
- In a study that looked at where the errors occur in the med rec process, 22 percent occur at admission, 66 percent at transfer and 12 percent at discharge. (Santell, J, Journal of Qual and Patient Saf April 2006;32;No 4:225-229)

Institute for Safe Medication Practices
a nonprofit organization

Stu Levine, PharmD, informatics specialist, Institute for Safe Medication Practices, Horsham, Pa.

"Discharge medication reconciliation is the area with the least amount of energy and resources," says Levine. Organizations tend to focus on admission and transfer med rec, he says, and discharge med rec "is not often done and not often done well."

"The real issue is that we should have been doing this all along. Too often the doctors merely say 'Continue patient's home meds,' which skirts the often painstaking task of reconciling the entire medications list. It's still the admitting physician's responsibility when admitting patients to the hospital," says Levine.

"Administrators are saying we can absorb this task, but nobody's been given the resources to do it," says Levine. A 2006 ISMP survey of hospitals found a very positive attitude toward the medica-

tion reconciliation process itself. Time is the key resource, as Levine says it takes about 20 minutes extra for each patient to do medication reconciliation.

Most places don't have an end-to-end electronic process for medication reconciliation. Usually it's some combination of electronic and manual. In most organizations the burden of initial collection of information has fallen on nurses, according to Levine.

"One thing people tend to forget is that there is a cognitive side to med rec. There's a thought process involved in reviewing, for example, a patient's list of 15 meds—which is not that uncommon—to evaluate whether they really need them. Many people look at med rec as merely a list or series of lists as opposed to a process of evaluation." IT can only do so much, like moving fields of data around, but it doesn't have the cognitive capability required to do medication reconciliation. Clinical decision support systems can check for duplicates and contraindicated drugs, but they can't perform the type of evaluation looking for the appropriateness of the medications on the patient's medication list.

And it's the prescriber who needs to be involved in the cognitive process. "Nurses and pharmacists can look for omissions, duplicates and contraindications but that's only a piece of med rec," says Levine.

Not only does it call for more team care but it requires that all the information be gathered into a single place. That means information systems being able to talk to each other. "You find that with med rec, like allergies, there's typically not a record of truth," says Levine.

Levine suggests that hospitals keep the following points in mind when implementing med rec:

1. Use internal examples of how med rec captured an error to better convince your medical staff to adopt it;
2. Don't look at med rec as a regulatory issue but as a patient safety issue;
3. If you have a process in place, even if paper, build in process measures to make sure it's working;
4. Make sure physicians are engaged in the actual process, looking at the workflow;
5. Carefully examine workflow to eliminate duplicative queries of patients unless necessary to establish the correct list and to establish where physicians and other healthcare professionals can play a role in the med rec process.

Reconciliation at Summa

Summa Health System, an Akron, Ohio-based six-hospital system serving southeastern Ohio, implemented a medication reconciliation system two years ago and is finding out just how difficult it is to measure the process. "Compliance prior to automating the process was difficult to capture, and after automating the process has improved auditing, and remains a challenge to validate the accuracy of the data being collected," says Pam Banchy, system director, clinical information systems.

She identifies the need for more in-depth information in a necessarily heterogeneous environment. "We have a model, procedure and policy and our numbers have gone up, but I don't want to falsely present ourselves as *the* model. Our organization likes to audit our perfor-

Upcoming Events continued

June 25
Second Generation Acute Care PACS >200 Beds
- Ben Brown, KLAS Enterprises, Orem, Utah

June 26
Implementing Standard Terminologies to Share Data: SNOMED Case Studies
- Cyndie Lundberg, clinical informatics educator, College of American Pathologists, SNOMED Terminology Solutions, Northfield, Ill.

July 7
Texas Health Resources Clinical Decision Support Implementation
- Luis Saldana, MD, MBA, medical director, Clinical Decision Support, Texas Health Resources, Arlington
- Ferdinand Velasco, MD, CMIO, Texas Health Resources

July 10
Clinical System Benefits-Driven Implementation: Lessons Learned from Early Adopters
- Doug Thompson, principal, Strategy Expert, CSC, Falls Church, Va.
- Patricia Johnston, FHIMSS, VP, Information Systems, Texas Health Resources, Arlington

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mance and we haven't done an audit on the medication reconciliation system in four months," and the data could easily have changed on how well the system is working, she says.

Pam Banchy, system director, clinical information systems, Summa Health System, Akron, Ohio

Banchy expects to have updated statistics in the next few weeks but it's clear there's a need for more granular compliance data. For example, in the med-rec process Summa nurses enter the drug name, dose and what the drug was for. Some nurses might enter "blue pill" for the medication and still achieve compliance. "You can't track just the fact that it was done," she says. "Was it done at each point? Was it done accurately? What was the result at discharge? That's what C-suite executives need to hear. And it's multidisciplinary. Doctors, nurses, pharmacists—it's a collaborative responsibility."

Summa has created a structured note that allows nurses to enter a patient's medication list, supported by a list of the top 200 prescriptions alphabetized by brand name. Nurses can write in drugs not on the list. They then enter the dose, frequency and reason why the patient is taking each medication. A clinical summary provides at-a-glance what drugs the patient came in on and what the patient has been prescribed since. But, the model is flexible in who takes the lead role. In the ER, for example, pharmacists are on duty from 2:00 pm to 1:00 am and take the patient's medication list; in other areas of the hospital, the nurse starts the process and the doctor completes it.

Some organizations have chosen pharmacists, some nurses and some advanced practice nurses to start the process. "There are many models. When we looked at ways to increase compliance we looked at what the impact of using pharmacists would be, but it would have been cost-prohibitive. Yes, compliance would have gone up but pharmacist salaries are too high," Banchy says.

Still, Summa's 42-bed hospital does use a pharmacist as the lead player in med rec because that facility has a decentralized pharmacy and it didn't have to add staff. Add to that the fact that Summa hospitals vary almost to a facility in their HIS (two have Eclipsys, the others each have different systems), and it's clear that Summa's med rec model is really a combination of several. "Every hospital is required [by the Joint Commission] to have medication reconciliation and every Summa hospital approaches it differently. We're in a hybrid transition," says Banchy.

That seems to be the reality on almost every level of medication reconciliation. Even data-focused health systems like Summa have difficulty quantifying the results of medication reconciliation. For example, a patient who has a 39-day length of stay may have only four points of transition that require reconciling drugs: admission from the ER, transfer to an ICU, transfer to a medical unit and then discharge. Another patient with a

Congratulations to SI members

Douglas Hawthorne, CEO, Texas Health Resources, and James Mongan, MD, President and CEO, Partners HealthCare System, were awarded CEO IT Achievement Award by Modern Healthcare and HIMSS. This annual award recognizes healthcare chief executive officers who demonstrate leadership and commitment in using IT to advance their strategic goals.

Douglas Hawthorne

James Mongan

much shorter stay might experience a dozen or more such transitions, including from the ER to the cath lab, to the OR, to recovery, then to critical care, a medical floor, diagnostic imaging, her room and discharge.

"It's not a matter of patient days, it's a matter of patient movement, which is so variable. The auditing piece of it is very difficult," says Banchy. "It's not a black and white task. You have to do a manual audit of each chart," which is done by Summa's Quality Center and Resource Management staff.

Advocate

The Joint Commission may require hospitals to perform med rec, but Advocate Health Care, a 10-hospital integrated health system based in Oakbrook, Ill., views it as part of its mission. "We've always looked at patient safety as a primary strategy of the organization," says Joel Shoolin, DO, VP, clinical informatics. "When you drill down to the causes of adverse events, medications percolate up to the top two or three. We've done a lot trying to improve safety and quality. Moving into the electronic health record and CPOE certainly helps, but it's not enough."

Shoolin understands the need for med rec on a nearly visceral level. "As a practicing family physician I was fairly obsessive about reconciling patients' medications, especially with nursing home work. And while I might not have done a great job, I was better than most. Clearly the handwriting was on the wall" that the industry had to tackle this issue head on, he says.

Advocate Health Care

Joel Shoolin, DO, VP, clinical informatics, Advocate Health Care, Oakbrook, Ill.

Shoolin says use of IT is imperative. "Doing med rec on paper is an arduous process—looking at multiple lists, writing multiple drugs—there's a lot of attention to detail. The vision of moving to electronic med rec is to make the process much easier because there's much better opportunity to look at drug lists side by side and to click from drug to dose, for example. You don't have to recopy all that information. You can also close the loop between the meds patients came in on versus the ones they've been prescribed in the hospital. In the hospital they substitute a lot, which can confuse the patient and raises the risk of taking two of the same type of drug," he says.

Advocate has implemented a med rec system with residents at its Illinois Masonic Hospital in Chicago, incorporating the application into its Cerner clinical information system. Shoolin and his team have had to work closely with the vendor to adapt the product to its needs.

Specifically, the application offers nurses an orders tab for documenting medication history, giving them options like "Unable to Assess," "History documented at prior encounter," and "Prescriptions documented at prior discharge." The actual Documentation Medication History Pane calls for entry of:

- Dose, Route, Frequency, PRN, PRN Reason, Indication;

Measuring med rec results is not a matter of patient days, it's a matter of patient movement, which is quite variable.

- Compliance, Information Source, Last Dose Date/Time, Comments;
- Display order information, last given.

Nurses are prompted with an electronic "task" to complete medication history upon admission. Once the medication history is accessed and completed, it can be modified by the nurse, pharmacist or physician. It also automatically pulls forward data from the patient's prior admission as a starting point for verifying the medication list. Physicians perform the actual medication reconciliation electronically, enabling the conversion of documented home medications to inpatient orders.

Physicians can also electronically reconcile medications at every change in level of care, continuing current inpatient medications and converting previously unconverted home medications to inpatient medication orders. Finally, the system allows doctors to perform reconciliation at discharge, converting inpatient medications to prescription, resuming documented home medications and, once reconciliation is complete, printing a Discharge Medication List for the patient that shows only active medications.

Advocate implemented a med rec education process for stakeholders, including classes and ongoing support for physicians, training nursing staff on medication history and training pharmacy staff as superusers. Still, Shoolin acknowledges that, like nearly every med rec system across the country, it's a work in progress. "Clearly the process is a lot better than it was before, but it's also a challenge to do this electronically," he says. Workflow presents the primary challenge, especially in converting the physician's workflow to software logic in a way that's nondisruptive and accounts for unforeseen needs like the physician's ability to go back and add prescriptions once the process has been completed. [The "Advocate Health Care Medication Reconciliation Case Study" was presented as an SI teleconference on May 7. Members can access the slide and audio presentation by clicking on Teleconferences under the Members Only heading on the SI webpage.]

Workflow presents the primary challenge, especially in converting the physician's workflow to software logic in a way that's nondisruptive and accounts for unforeseen needs like the physician's ability to go back and add prescriptions once the process has been completed.

North Carolina

The North Carolina Hospital Association in 2004 established the North Carolina Center for Hospital Quality and Patient Safety as a way to help NC hospitals reach their aim of making healthcare in North Carolina the safest and highest quality through education and training, collaborative learning programs and hospital performance measurement. In the role of consultant to the center for quality improvement and patient safety, Barbara Edson, RN, MBA, focuses on hospital collaboratives.

Barbara Edson, RN, MBA, consultant, North Carolina Center for Hospital Quality and Patient Safety, Cary, NC

North Carolina Center for Hospital Quality and Patient Safety

Having seen her otherwise conscientious mother mistakenly take two versions of the same drug because they happened to have different brand names, Edson became

convinced that med rec should be top priority as a center-sponsored hospital collaborative. She led development of the Medication Safety Reconciliation Tool Kit to help hospitals establish a medication reconciliation process. [The Tool Kit is available on the Institute for Healthcare Improvement website at www.ihi.org/IHI/Topics/PatientSafety/MedicationSystems/Tools/MedicationSafetyReconciliation/.]

Edson sees the tool kit as an abbreviated guide. Some hospitals have achieved marked improvement using the tool kit in combination with the collaborative services; some have not made much improvement. Success depends on whether an organization has been able to instill a collaborative and learning culture.

"Medication exemplifies everything that's wrong and right with healthcare. If we can get this right we have great hope for reforming healthcare. It's very difficult for hospitals to do," she says. Much of the problem with implementing med rec, like nearly every healthcare reengineering initiative, is that we ask nursing and other managers in functional silos to fix things that cut across the enterprise. "We don't do a very good job of project management," Edson says.

While she likes the pharmacist-based med-rec model, Edson says even if a hospital can afford to invest in the FTEs to support that approach, it faces resource limitations because pharmacists are in even greater shortage than nurses. Given such a scenario, she advocates practicing the art of the possible: Identify the patients where you can make the biggest safety impact—patients with comorbidities or patients who take high-risk medications—and triage them for the pharmacist to consult on their medication-reconciliation process.

Conclusion

Medication reconciliation is a microcosm of the thorny challenge we face in reengineering the healthcare system through IT-enabled process improvement. CSC's Troiano says med rec presents just the latest and one of the clearest arguments for integrated information. That's a story that continues to unfold. There are other factors as well. "Use of hospitalists makes this easier because they take responsibility for a patient's overall care in the inpatient setting," he says, and they are more directly obligated to the hospital to address enterprise issues.

Also, vendors will and are coming through with better software, including a few who make available retail pharmacy records. Insurers will also be brought more into the solution. "Insurers know what they're paying for. The advent of e-prescribing will take some of the pressure off hospitals," says Troiano.

Advisors

Paul Browne, Trinity Health
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