

# Prescriptions for Excellence in HEALTH CARE

A COLLABORATION BETWEEN JEFFERSON SCHOOL OF POPULATION HEALTH AND LILLY USA, LLC

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## Editorial

### A Call to Action on Transitions of Care

By *David B. Nash, MD, MBA*  
*Editor-in-Chief*

For some time, we've known that the high degree of fragmentation in our health care system is spawning many of its problems. Inadequate communication and poor transitions of care (TOC) undermine even the best care planning.

The ripple effect from ineffective TOC is broader than one might think. When vital information regarding therapy is "lost in transition," it undermines patients' and families' confidence in their providers. It also creates friction and potentially damages important relationships between inpatient care facilities and primary care physicians.

The good news is that TOC has come under the microscope of health care reformers as they recognize the need to reduce preventable – and costly – hospital readmissions precipitated by flawed handoffs. Our national accreditation and oversight organizations are getting on board; for example, The Joint Commission's Center for Transforming Health Care (2009) signaled its keen interest in TOC by making handoff communications its second major target in solving health care's most critical safety and quality problems.

As a physician, the proactive efforts that are already under way in medical education are most heartening. Chief among these is the American Association of Medical Colleges' (AAMC) "Integrating Quality (IQ)." This organizational quality improvement initiative is aimed at integrating quality and patient safety improvement into the educational process across the full continuum of medical education. The IQ Team and Steering Committee are already engaged in 3 major objectives:

- **Learning** - sharing innovative approaches to quality and safety integration
- **Serving** – packaging resources (eg, team training initiatives) and responding to the needs of AAMC members

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*(continued on page 2)*

- **Leading** – assisting AAMC members in implementing educational and clinical quality and safety initiatives

In this issue of *Prescriptions for Excellence in Health Care*, we continue our exploration of how TOC processes are being improved by provider and professional organizations across the health care spectrum.

The first article, “The Role of Readmission Risk Assessment in Reducing Potentially Avoidable Rehospitalizations,” introduces some recently developed generic models that are relatively simple to apply, and promotes the use of a comprehensive readmission reduction system as part

of an organization-wide strategy for cost savings.

After documenting the facts and discussing the magnitude of the problem, the article entitled “Handoffs and Transitions in Care: An Inpatient Perspective” presents a real-world example of the positive change that can be achieved with a system-wide overhaul of TOC care practices. The results are impressive.

Finally, “Pharmacists: Part of the Transitions of Care Team in the Ambulatory Setting” introduces the relatively new concept of medication therapy management and suggests a broad range of venues and opportunities in which specially trained pharmacists

are well suited to the task of improving TOC, particularly for patients with multiple chronic conditions.

Once again, I commend our authors and the projects they have chronicled in this issue. With proactive leadership like this, the outlook for improved TOC begins to look more optimistic.

As always, I welcome reader comments and questions. I can be reached at david.nash@jefferson.edu.

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## A Message from Lilly Creating Better Connections

*By Alex M. Azar, II*

Many of us pride ourselves on doing more with less and being able to multitask ad infinitum. In reality, it's difficult to produce quality while chasing after too many “priorities.” At Lilly Managed Healthcare Services, we respect our customers' role in the health care system and strive to build stronger relationships by centering on patients and meeting the health care needs that will improve the health care system overall.

With increased pressure to produce quality health care under the current health reform, we expect to intensify our push for new and innovative solutions. While we recognize that the problems are not solely ours, Lilly is committed to shifting its emphasis to the needs of a connected health care system. We want to be part of a new

paradigm in health care, raising the bar on great leadership, engaging and motivating our own employees, and focusing relentlessly on our patients and our customers who serve our patients. Our road map will be guided by our vision: Improved Outcomes for Patients.

Improving patient outcomes is one of the goals of health reform. There is no one clear path to achieving these outcomes; however, the Centers for Medicare and Medicaid Services and private payers have been piloting programs that are transitioning to pay-for-performance programs. The patient must be at the center of these programs, ie, consideration must be given to the episode of care as the patient will experience it. Within each episode of care are transition

points from one site of care to the next (eg, to hospital from home, from hospital to skilled nursing care). One way to improve transitions within our health care system is to create better connections between the points of care by assuring the delivery of high-quality customer/patient service at every step of the process.

If you think about the difference between a 3-star hotel and a 5-star hotel, it is not the basics such as having a bed, clean sheets, and a coffee pot in the room. The difference is the level of service you receive, and it is the little things that set superior organizations apart. Employees of 5-star hotels anticipate your needs. They greet you by name at check-in and, upon your return visit, remember what kind of soda you prefer. If each

person involved in the continuum of care for a patient were to think about providing excellent customer service - similar to that of a 5-star hotel - imagine how we could improve the patient experience and the transitions across the continuum of care.

A 5-star care continuum would require mapping out the patient flow and transition processes, identifying the major destinations for the patient, and designing critical interventions to create better connections at each transition point to prevent gaps in care and to enable a more positive patient “experience” in what is an unpleasant and vulnerable time for any individual. Delivering positive

health outcomes *and* superior patient experiences is not only the right thing to do; it will lead to more engaged and self-actualized employees who are connected more directly to the mission that originally drew them to health care.

Let us all strive to move the bar higher. We at Lilly are focused on creating better connections in health care that will expand our thinking and push us to act in new and positive ways for the benefit of our patients. We are constantly looking at how we will connect the right patients to the right medicines and drive better patient outcomes. Our approach

will be simple and time tested: to improve and exceed expectations at multiple steps through service to the multiple stakeholders in the system. Most important is stepping up to the challenge of improving experiences and connecting the dots for our patients so that quality is an experience they will know and expect.

*Alex M. Azar, II, is Vice President Managed Healthcare Services and Puerto Rico, Lilly USA, LLC.*

## The Role of Readmission Risk Assessment in Reducing Potentially Avoidable Rehospitalizations

By Omar Hasan, MBBS, MPH, FACP

Readmission to the hospital within a few days of discharge can be disconcerting to patients and may be linked to inadequacies in care delivery during transition from the hospital.<sup>1,2</sup> In recent years, increasing payer interest in curtailing payments for early rehospitalization and the advent of public reporting of 30-day readmission rates have prompted providers across the country to focus on finding ways to reduce potentially avoidable hospital readmissions.<sup>3,4</sup> Although broad-ranging improvements in the quality of care delivery during transitions will likely be necessary to achieve tangible reductions in early rehospitalization, the scarcity of resources in most health care systems will dictate that initial efforts be focused in areas of highest potential impact.

One feasible approach to maximizing the efficiency of quality improvement (QI) efforts in this area is to identify patients at high risk for readmission and selectively target care coordination resources to this subset. Such an approach is appealing because it permits focusing scarce resources where the impact may be greatest, provides a starting point for organizations struggling to find a focus amidst the myriad of choices for directing QI efforts, and allows for piloting robust models of transitional care delivery that can subsequently be expanded to include patients at progressively lower thresholds of readmission risk. Integral to this approach is the thoughtful selection and suitable application of appropriate readmission risk prediction models.

### Readmission Risk Prediction

Readmission risk prediction is predicated on the logic that the presence of certain individual characteristics can prospectively identify a subset of patients at higher-than-average risk of early rehospitalization. The application of regression analysis to large inpatient databases has made it possible to delineate the relationship between pertinent patient characteristics and time-limited readmission risk in a mathematical formulation that can form the basis of a simple risk scoring system. Such risk prediction models or scoring systems can be used to develop a practicable framework for readmission risk assessment.

*(continued on page 4)*

A high degree of *accuracy* in predicting the outcome of interest and a high level of *precision* in replicating predictive accuracy across relevant populations are the 2 key attributes of a valid and reliable risk prediction model. Accuracy of prediction is inversely related to how restrictively the outcome is defined; thus, it is harder to accurately predict the likelihood of 30-day readmission versus a *combined* outcome of 30-day readmission, or emergency department visit, or death. Precision depends, in part, on how closely the population to which the risk prediction model is being applied resembles the sample population used to derive the model. Both accuracy and precision are affected by the selection of appropriate patient characteristics for inclusion in the model building process (ie, whether these characteristics are representative of the majority of causative factors thought to be responsible for substantially increasing readmission risk in the population under consideration).

One of the key challenges in finding an appropriate readmission risk prediction model for use in QI efforts is selecting the most suitable model from among the multitude of condition-specific, as well as generic (ie, applicable to general medical or surgical patients), risk prediction models in the published literature.<sup>5-10</sup> One must consider 3 questions before making such a decision:

- (1) Are QI efforts currently focused on specific patient populations (eg, heart failure or pneumonia patients), in which case the most suitable condition-specific model should be sought?
- (2) Are the data elements in the model readily available from existing clinical and/or billing information systems?
- (3) Are the organization's frontline care providers – who will be responsible for

using the model – likely to believe in its integrity and usefulness?

For the sake of brevity, the remainder of this article will focus on generic risk prediction models for adults, because these are applicable to a larger population of hospitalized patients than most condition-specific models.

As can be expected, results of regression analyses of several large hospital databases reveal that the strongest generic predictors of rehospitalization include: the number of prior hospitalizations or emergency department visits, the presence of multiple comorbid illnesses, and hospital length of stay (a proxy for severity of illness).

Two recently developed generic models deserve mention because of the simple and easily used risk scoring systems they have devised. Walraven and colleagues were successful in creating a simple risk scoring system through logistic regression analysis of patient characteristics in a multihospital database of 4812 medical or surgical discharges from 11 Ontario, Canada, hospitals (6 university-affiliated and 5 community hospitals).<sup>9</sup> Nursing home residents and cognitively impaired patients were excluded from this analysis. Four patient characteristics were found to be significantly predictive of death or unplanned readmission within 30 days of hospital discharge: hospital length of stay (“L”), acuity of the index admission (ie, emergent admission; “A”), comorbidities (measured with the Charlson comorbidity index; “C”), and prior emergency department use (number of visits in the previous 6 months; “E”).

To facilitate recall of these 4 elements, the model was titled using a simple mnemonic, “LACE,” and referred to as “the LACE index.” This model was externally validated in a random sample of 1 million medical or surgical

discharges from all Ontario hospitals (between April 2004 and January 2008) and found to perform reasonably well, with the median absolute difference between expected and observed 30-day death/readmission rates being only 1.6% (range 0.04% to 6.6%).

Hasan and colleagues also used logistic regression analysis to create a simple 30-day readmission risk prediction scoring system using a multihospital database of 10,946 home discharges from the general medicine services of 6 US academic medical centers; patients who died within 30 days of discharge were excluded from this analysis.<sup>10</sup> Seven patient characteristics were noted to be significant predictors of unplanned hospital readmission within 30 days of discharge: health insurance status (other than private insurance), being currently married, having a regular physician, Charlson comorbidity index, Short Form-12 physical component score, prior hospital admission(s) within the last 12 months, and hospital length of stay (of longer than 2 days). Points were assigned to each predictor and score cutoffs were determined to identify 5% of patients with an approximately 30% or higher risk of readmission within 30 days of discharge. Whereas 6 of the 7 predictors were positively correlated with a high readmission rate, having a higher physical function score on the Short Form-12 questionnaire was negatively associated with readmission risk for self-evident reasons.

### **A Comprehensive System for Assessing Readmission Risk**

Although daunting in itself, selecting and deploying a regression-based readmission risk prediction model is only the first step toward realizing the full potential of readmission risk assessment in reducing potentially avoidable rehospitalizations. Despite the availability of robust statistical models for predicting

readmission risk, risk assessment has yet to become a routine part of the health care delivery process across many provider organizations. This is largely attributable to the difficulty in linking model-predicted readmission risk with available risk reduction interventions.

There are 3 salient reasons for this implementation gap. First, risk prediction models, although useful as tools for selecting a high-risk subset of patients, are not user friendly for frontline clinicians such as bedside nurses, hospitalists, case managers, or discharge planning nurse specialists. There are 2 dimensions to this issue: not only are many risk prediction models suboptimal in categorizing patients into easily understandable low-, intermediate-, and high-risk categories, they are also poorly integrated into the current tools and workflow of frontline clinicians.

Second, because regression-derived models are designed to be parsimonious, key patient characteristics that may be actionable (eg, the need for help with executing discharge care instructions) are excluded from the final versions of most models as a result of their seemingly lower predictive power when compared with variables such as prior health care utilization. Unfortunately, a high score on a variable such as prior health care utilization isn't easy for frontline caregivers to link with a concrete choice of intervention such as a postdischarge phone call or arranging visiting nurse services.

Third, the evidence demonstrating effectiveness of interventions for mitigating readmission risk has only begun to grow in recent years and, in most cases, frontline caregivers will have to continue to rely on a combination of evidence-driven interventions and their own best judgment in assigning interventions for the next few years.

It follows from the aforementioned that, in order to hardwire readmission risk assessment into clinical workflow and achieve measurable reductions in potentially avoidable early rehospitalizations, organizations will need to focus efforts on developing a comprehensive system for readmission risk assessment. Such a system should not only emphasize selection of the most appropriate risk prediction model but also address salient causes for the implementation gap cited previously. Risk prediction models should be integrated into tools that are currently used to assess patients' discharge needs and systematically assimilated into everyday clinical workflow through an iterative process of sequential plan-do-study-act cycles.

Additional questions directed at assessing the need for particular risk reduction interventions should be added to risk prediction scoring systems in order to devise hybrid tools that combine risk prediction with a template for matching patients to appropriate interventions that target the risk elements identified.

In designing pathways for linking interventions to patients, frontline caregivers should be allowed flexibility in selecting interventions, taking into consideration the uncertainty that exists about the effectiveness of known interventions in the published literature. Lastly, organizations should seek to maximize utilization of existing programs and resources through adoption of such a comprehensive risk assessment system before embarking on efforts to devise new programs or interventions.

### Conclusion

Readmission risk prediction holds great promise as a tool to focus efforts to reduce potentially avoidable rehospitalizations. Key to realizing its full potential are appropriate model

selection, integration into existing tools and workflow, and ensuring appropriate linkages with risk reduction interventions. Despite these challenges, effective use of a comprehensive system to assess readmission risk is an essential step toward successful implementation of an organization-wide strategy aimed at saving costs through measurable reductions in 30-day rehospitalizations.

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## Handoffs and Transitions in Care: An Inpatient Perspective

By Stephen A. Knych, MD, MBA

### The Hard Facts

The 1999 Institute of Medicine (IOM) report, *To Err Is Human*, estimated that 98,000 people die from medical errors each year. The Institute for Healthcare Improvement's (IHI) 5 Million Lives Campaign calculated an approximate 15 million adverse medical events each year, 6 million of which cause harm to the patient that results in a significant deviation in the patient care process.<sup>1</sup>

A study commissioned by the Society of Actuaries reviewed inpatient claims data (for the year 2008) for 24 million Americans and revealed that:<sup>2</sup>

- 6.3 million medical injuries occurred including 1.5 million resulting from medical error
- 7% of inpatient admissions resulted in some type of medical injury
- Collectively, errors cost the US health care system roughly \$19.5 billion in inpatient, outpatient, prescription drug, and other services and resulted in more than 2500 excess fatalities and 10 million excess days of work missed.

As the foregoing statistics attest, medical error resulting in patient harm is a real and present danger that is endemic to the current health care system. This article reviews the evidence suggesting that failure of communication and/or failure in transitions in care are direct or contributing causes of medical errors and patient harm in the inpatient setting.

### Scope of the Problem

How many times is the responsibility for a hospitalized patient's care transferred from 1 provider to another,

or from one unit to another, in a given day? In his study of a teaching hospital environment, Vidyarthi calculated that as many as 4000 provider-to-provider handoffs occur daily.<sup>3</sup> Patient care is handed off among care providers or transitioned from one unit to another during shift changes, surgical procedures, imaging tests, and therapy treatments. In fact, a patient experiences a transition in care even upon admission (ie, from the emergency department [ED] or surgical suite to an inpatient unit).

When surveyed, ED physicians reported that 29% of their patients experienced an adverse event or near miss when transferred from the ED to an inpatient unit.<sup>4</sup> In a study concerning surgical errors, Riesenbergs discovered that communication breakdowns contributed to 43% of the errors observed, and that poor handoffs contributed to 66% of these communication breakdowns.<sup>5</sup>

The handoff and transition in care processes are clearly vulnerable to communication failures as illustrated by published reports and the experiences of The Joint Commission (JC). In fact, breakdowns in communication are the leading cause of sentinel events reported to the JC and are identified as a root cause for two thirds of sentinel events.<sup>6</sup>

The Pennsylvania Patient Safety Authority, another prominent oversight organization, receives frequent reports of communication breakdowns during transitions in care to ancillary departments.<sup>7</sup>

The Agency for Healthcare Research and Quality (AHRQ) has designed

and implemented the Hospital Survey on Patient Safety Culture (HSOPSC) to measure health care staff and physicians' perception of safety over 12 hospital domains. From 2007 through 2009, 108,000-196,000 health care providers in over 800 hospitals across the United States responded to this survey. The results indicate that if a mere 61% of respondents answer positively to questions regarding the processes of handoffs and transitions in care, their hospital ranks in the 90<sup>th</sup> percentile nationally (Figure 1). Sadly, where handoffs and transitions in care are concerned, our hospitals can receive an "A" ranking (90<sup>th</sup> percentile) with a score of "D" (61% positive).

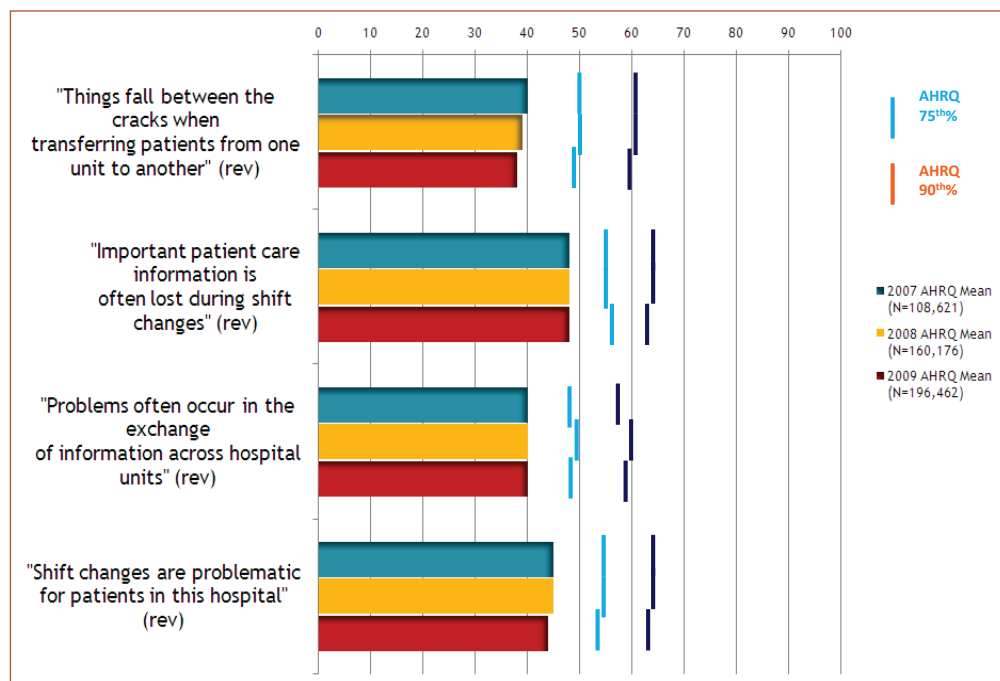
In 2005, Solet et al reported that only 8% of US medical schools taught a formal, didactic session on how to perform patient handoffs. Physicians' opinions as to what information should be communicated in handoffs varied greatly.<sup>8</sup>

### Impact of the Problem

The economic public health impact of faulty handoff communication and transitions in care has been demonstrated, but how is the impact felt in the medical liability community? Likewise, how do we measure the adverse impact of faulty transitions that have led to medical errors and harm to the population at large?

Reviews of malpractice claims showed that inadequate handoffs were a contributing factor in 20% of errors leading to claims in the ambulatory setting, and in 24% of errors leading to claims in the ED setting.<sup>7</sup>

In her article, "Patient Safety: A Patient Perspective," Linda Kenney

**Figure 1. 2007-2009 Patient Safety Survey: AHRQ Handoff & Transitions**

Source: Agency for Healthcare Research and Quality (AHRQ). Overall results. In: Hospital Survey on Patient Safety Culture: 2010 User Comparative Database Report. <http://www.ahrq.gov/qual/hospurvey10/hosp10ch5.htm>. Accessed July 29, 2010.

conservatively estimated that, in the hospital setting, the IOM report of 98,000 deaths due to medical error each year would emotionally impact 12 million family members and 12 million health care providers.<sup>1</sup>

### Potential Solutions

In 2006, the JC established National Patient Safety Goal (NPSG) 02.05.01 that required all health care organizations to develop and implement a standardized approach to handoff communication. This goal does not specifically address standardizing a process for in-hospital transitions in care.

In 2010, NPSG 02.05.01 was retired as a NPSG and became a part of the Provision of Care chapter of the *Accreditation Manual for Health Care Organizations*. Should the JC consider a NPSG to address a process for inpatient transitions in care?

Some researchers argue against standardization or “one size fits all” in

the belief that, because the process of health care is often disparate among departments and caregivers, transitions in care should be approached in a customized fashion.<sup>9</sup>

In this sense, going from the ED to a medical/surgical unit (med/surg) is likely to differ from going from the ED to the intensive care unit (ICU). Similarly, the process for moving an ICU patient to the imaging department is likely to be designed differently than the process for taking a med/surg patient to the imaging department.

Recognizing the complexity of this dilemma, the IHI in 2010 recommended designing workflows to minimize the number of handoffs and transitions in care that a patient experiences.<sup>10</sup>

What are the key design components for handoff communication and transitions in care? Generally speaking, the essential design elements to improve handoff communication and

facilitate more effective, safe transitions in care include:

- *Physical Setting*: a location reasonably free from distractions, noise, interruptions (“sterile cockpit”)
- *Safe Culture*: flattened hierarchy capable of open exchange of information and discussion of patient treatment issues
- *Functional Diversity*: enable effective exchanges between team members of different ethnic backgrounds and languages
- *Communications Mode*: face-to-face whenever possible (eye contact, facial expressions, body language)

### A Case Study

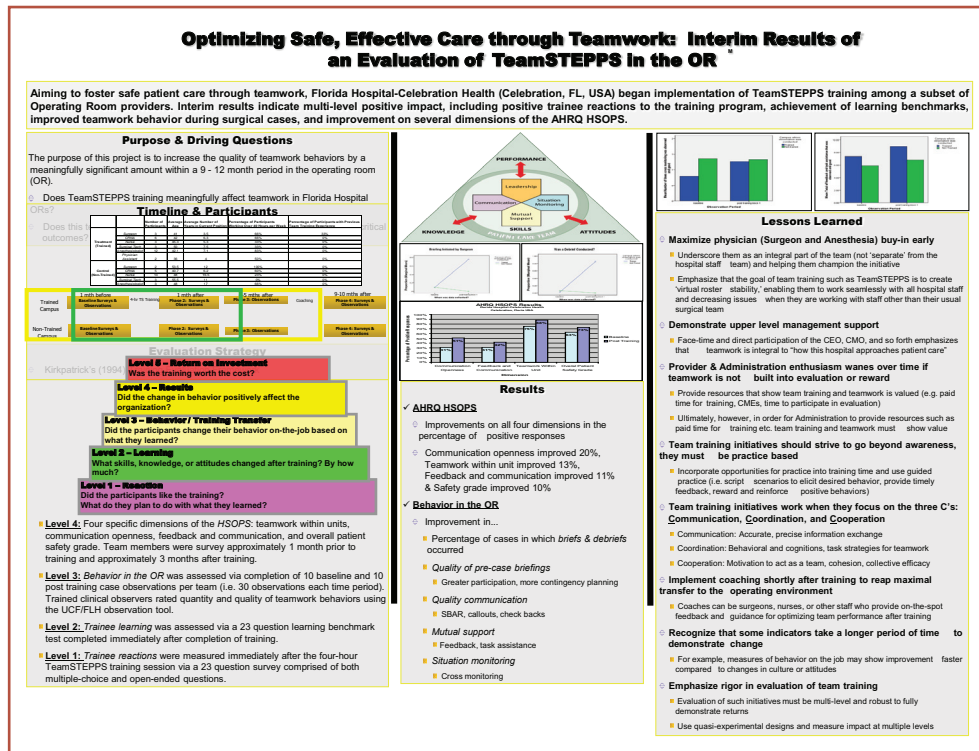
In 2009, a large integrated health care system in southeastern United States began a comprehensive overhaul of handoffs and transitions in care practices, keeping in mind the core components listed above.

A common nurse (RN)-physician (MD) and MD-MD communications tab was created in the electronic health record. Communication processes were redesigned and are being implemented between the following core groups: MD-MD, MD-RN, RN-RN, RN-patient, and RN-patient transporter. RN care guidelines were embedded into a new “ticket-to-ride” transport handoff process that included closed-loop communication and documentation thereof upon return of a patient from a diagnostic or surgical procedure to the inpatient unit.

Figure 2 displays the recently published results of the initial research on team training in the operating room setting in one of our facilities.<sup>11</sup> One of the study’s aims was to use team training techniques to promote a flattened hierarchy and to facilitate more open exchange of information among all care providers.

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**Figure 2. Optimizing Safe, Effective Care through Teamwork: Interim Results of an Evaluation of TeamSTEPS in the OR**



For more information, see: Weaver SJ, Rosen MA, DiazGranados D, et al. Does teamwork improve performance in the operating room? A multilevel evaluation. *Jt Comm J Qual Patient Saf.* 2010;36(3):133-142.

This large integrated health care delivery system demonstrated an 11% improvement in the HSOPSC domain of handoffs and transitions in care on the 2009 AHRQ survey. AHRQ considers any improvement greater than 5% to be significant and meaningful per their established standards of measurement.

Is this a blueprint for success?

## Conclusion

In reference to health care systems, Jim Conway, IHI Senior Fellow and the former Vice President and Chief Operating Officer of the Dana-Farber Cancer Institute, has been quoted as saying, "Our systems are too complex

to expect merely extraordinary people to perform perfectly 100 percent of the time. We as leaders have a responsibility to put in place systems to support safe practice."<sup>12</sup> It is our responsibility to our patients, to our staff, and to the US health care system to use the foundational elements listed above to create handoff communication processes that facilitate safer, more effective inpatient transitions in care.

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## Pharmacists: Part of the Transitions of Care Team in the Ambulatory Setting

By Mary Ann Kliethermes, BS, PharmD

As the health care community continues to grapple with problems plaguing our health system, including transitions of care, it becomes increasingly important that we achieve optimal utilization of the resources already present in the system. The skill and knowledge of the ambulatory pharmacist is an example of a resource that is currently underutilized.

### The Evolving Role of Pharmacists

Pharmacist training and the practice of pharmacy have changed dramatically over the past 40 years, from a concentration on drug dispensing to a clinical pharmacy approach that focuses on the patient and his or her optimal use of medications.

Clinical patient care services by pharmacists to optimize medication use are solidly established in the institutional setting. Ample evidence demonstrates the value of hospital-based pharmacists in reducing adverse drug events, and improving medication adherence, knowledge, and appropriateness.<sup>1,2</sup> Because the majority of medications are used by patients in the ambulatory setting, similar medication-related needs are changing the roles of pharmacists practicing in the community.

For transitions of care to occur with the desired level of patient safety, multidisciplinary collaboration among all health professionals directly involved with patients and their medications is necessary. Of the many health care providers on the team, pharmacists are most likely to have a complete view of a patient's medications - those that are ordered by a patient's various health care providers as well as over-the-counter or herbal medications

a patient may consume. Trained to provide clinical patient care services, pharmacists are well positioned to perform key elements of the medication reconciliation process as they work with other members of the team.

The most visible service provided by ambulatory pharmacists is processing and dispensing prescriptions. Tied closely to this service is counseling patients on their medications. Although this is a required service, it is not always effective and does not occur consistently for a number of reasons including the patient's right to refuse such counseling.

Simple improvements in prescription communication could greatly enhance the ability of the dispensing pharmacist to assist patients during transitions of care. For instance, providers' prescriptions written in institutional settings include information such as: stop drug X, change dose to X mg, or switch therapy to X medication. If providers wrote prescriptions in the ambulatory setting in a similar fashion, the pharmacist could assist the patient in following physician orders. Without communication from the physician, the dispensing pharmacist has no knowledge of the physician's intent to stop one medication and start another and is therefore unable to reinforce the instruction with the patient. Such small, simple "fixes" have the potential for a strong, positive impact.

Improving patient education and knowledge at every step is important in the process of understanding how to use medications. Disease and its therapy are complex concepts that are difficult to learn, especially for those who already

feel poorly or those with poor health literacy. Because repetition is important in such learning, routine counseling regarding medications could serve to reinforce understanding and identify areas where patients may be confused about their therapy. Again, the more information the pharmacist has regarding patients' medical conditions and goals of therapy, the greater the benefit from the counseling process. It follows that the larger the perceived benefit from counseling the more likely this service will be demanded and provided.

### Medication Therapy Management

A growing number of pharmacists in the ambulatory setting are providing clinical patient care services such as those encompassed by medication therapy management (MTM). MTM is a group of ongoing, comprehensive, and coordinated services to optimize medication use, particularly for patients with chronic conditions and those with complex or expensive medications.<sup>3</sup> MTM is geared toward the needs of a single patient and may include any of the services listed in Table 1.

MTM is mandated by the Medicare Modernization Act of 2003 ( Medicare Part D benefit) and is a feature of the innovative initiatives mandated in the 2010 health reform legislation such as the Patient-Centered Medical Home (PCMH).<sup>4</sup> A major goal of MTM services is to reduce medication-related problems, making medication reconciliation an essential component of any MTM program.

Pharmacists providing MTM patient-focused services have greater knowledge of patients' conditions, therapy goals,

*(continued on page 10)*

and other health needs. In this role, they may provide the greatest benefit to patients during transitions of care. With some tweaking and resolution of existing barriers, medication-related transitions of care can be improved by the pharmacist while providing any of the above services.

Pharmacists may provide MTM services through affiliation with an outpatient or community pharmacy, or these services may be provided in more innovative settings. The number of pharmacists practicing and providing MTM services within physician offices and medical clinics is likely to increase as physician groups and health care organizations realign to adopt the PCMH model of patient care. Providing MTM services within a patient’s home - another cutting-edge MTM model - may be the optimal method of providing MTM to the frail or most vulnerable patients.<sup>5</sup>

Personal experience providing MTM services at an urban university outpatient pharmacy-based clinic underscored the prevalence and seriousness of medication discrepancies in an indigent, elderly population with multiple conditions, multiple providers, and multiple prescription medications.<sup>6,7</sup> Problems occurred following multiple provider visits as well as during transitions from institutions.

Despite the availability of an integrated electronic medical record to all providers, including the MTM clinic and pharmacy, medication discrepancies were numerous and common. The MTM pharmacist’s role was to identify the medication discrepancy and serve as a knowledgeable communicator between multiple providers to resolve the medication problem. Consequently, medication reconciliation and providing patients with up-to-date medication lists became an integral and expected service of the clinic.

**Table 1. Medication Therapy Management Services**

1. Assisting patients with access to medications and care
2. Assisting patients with medication adherence
3. Performing medication reconciliation
4. Performing or obtaining necessary assessments of the patient’s health status
5. Coordinating care among a patient’s providers with regard to medications
6. Performing a comprehensive medication review
7. Identifying medication-related problems
8. Formulating a medication treatment plan
9. Selecting, initiating, modifying, or administering therapy under a collaborative practice agreement
10. Monitoring and evaluating the patient’s response to therapy, including safety and effectiveness
11. Providing patient education and training designed to enhance patient understanding and appropriate use of medications
12. Documenting and communicating care to other providers.

**Table 2. Pharmacy Quality Alliance Medication Reconciliation Measures**

- Percent of patient encounters during which a patient’s personal medication list is available
- Percent of patients for whom a documented personal medication list was created among patients without documented personal medication lists
- Proportion of pharmacist-patient encounters where a patient’s personal medication list is reviewed, updated, and reconciled
- Percent of the patient’s personal medication list discrepancies resolved per patient encounter compared to the patient’s personal medication list discrepancies identified per patient encounter
- Percent of patient encounters during which the patient is provided with a reconciled personal medication list compared to the number of patient encounters
- Percent of high-risk patients with a new prescription or renewal of a prescription whose medications were reconciled \*

\* High-risk refers to a Medicare Part D beneficiary who takes 8 or more chronic medications or who receives an oral high-risk medication as defined by Institute for Safe Medication Practices.

Very little research exists in the area of ambulatory pharmacists and their roles in medication reconciliation in the community setting. A recent study in an internal medical clinic associated with an urban safety net hospital

measured accuracy of a nurse-completed medication reconciliation form for 90 clinic patients before and after a pharmacist-led 20-minute education session.<sup>8</sup> The in-service session focused on the importance, process, and

organizational policy of medication reconciliation. The researchers found that errors in the nurse-completed medication reconciliation forms were common (only 14.4% of completed forms were correct) and the 20-minute education intervention increased the accuracy by a mere 4.5% to 18.9%.

A second study - a retrospective review of 100 patients in a family practice center affiliated with a university health system - compared the pharmacy's and the physician office's patient medication lists<sup>9</sup> with the goal of describing the types and frequencies of medication discrepancies between the 2 sites. Patient usage of physicians and the pharmacy within the center was high. Researchers found an average of 6 medication discrepancies per patient. The top reasons for discrepancies were inactive medications, medications excluded, dose mismatch, and therapeutic duplication.

Although these studies add to our knowledge of the issues pertaining to medication use and reconciliation in the community setting, they do not evaluate the role and benefit of the ambulatory pharmacist in the medication reconciliation process.

Despite the lack of evidence, it is reasonable to assume that the services provided by an ambulatory or community pharmacist would likely mirror the evidence that exists for the hospital pharmacist. However, additional barriers in the community setting must be resolved. The average community or ambulatory pharmacist often practices in isolation with little information about the patient and the purpose and goals of the prescribed medication(s). This greatly impedes the pharmacist's ability to contribute at an optimal level within the multidisciplinary team. Connecting the pharmacist to the medical practice as proposed in the PCMH model is one way to overcome this barrier.

A lack of standard communication methods among the multidisciplinary team members is another impediment. It is difficult to resolve medication discrepancies identified for a patient if team members are unable to communicate in an efficient and timely manner.

Because MTM programs are fairly new, the number of programs with trained pharmacists may be insufficient to adequately address the prevalence of the problem and the number of patients who could benefit from the service.

Finally there is little or no reimbursement for MTM or medication reconciliation, placing the growth and sustainability of these needed services at risk.

The substantial medication needs of patients in the community require each member of the care team to participate fully to improve medication transitions of care. This premise is a key tenet of the Pharmacy Quality Alliance (PQA), a collaborative of key stakeholders including pharmacy organizations (representing pharmacists in all areas of practice), the federal government, insurers, industry, and other health care providers whose purpose is to improve health care quality and patient safety.

The Medication Reconciliation Cluster Group, convened by the PQA, was charged with developing quality measures pertaining to medication reconciliation in the community (2008) and developing a research concept proposal to utilize ambulatory pharmacists as part of the health care team involved in medication reconciliation (2010). The group has developed a set of 5 measures to comprehensively evaluate the medication reconciliation process, as well as a smaller, more focused, measure geared toward measurement of the process in a high-risk cohort (Table 2).

Development of the concept paper is well under way.

We all recognize that, of the many problems facing patients in our health care system, medication problems are among the most prevalent. It will take a team of all involved health care providers, working efficiently in tandem and at their highest levels, to provide the best quality and safest care for our patients.

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