Hahnemann University **HOSPITAL**

Quality and Workflow:

How Novel Medication Reconciliation Software Transformed Communication & Enhanced Patient Safety

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• Safety • Quality • Service

MAGNET RECOGNIZED
AMERICAN NURSES CREDENTIALING CENTER

Hahnemann University **HOSPITAL**

- Part of Tenet Healthcare Corporation (49 Hospitals)
- Academic Teaching Hospital
- Affiliated with Drexel University
- 496 Beds
- Urban Environment – Philadelphia, PA

Level 1 Trauma Center

Hahnemann University **HOSPITAL**

- Ranked one of nation's Top 50 Hospitals for Cardiology & Heart Surgery – *U. S. News & World Report*, 2007, 2010, 2011
- Ranked fourth among 91 hospitals in Philadelphia metro area - *U.S. News & World Report*, 2012
- Ten specialties ranked "high performing" in Philadelphia metro area - *U.S. News & World Report*, 2012
- Ranked fifth among hospitals in Philadelphia area, nine specialties ranked "high performing" - *U.S. News & World Report*, 2011
- FACT Accreditation, Bone Marrow Transplantation, 2011
- Magnet Recognition Facility, ANCC (American Nurses Credential Center), 2009
- Best Places to Work, *Philadelphia Business Journal*, 2008, 2009, 2010, 2011
- Gold Plus Performance Achievement Award for Stroke, American Heart Association, 2010

http://www.hahnemannhospital.com/en-us/aboutus/pages/awards%20and%20designations.aspx

Conference Objective Met

Evaluate effectiveness in Integrating New Technologies that Support Quality Improvement

Learning Objectives

1. Employ workflow redesign utilizing technology to promote safety through enhancing communication among caregivers.
2. Examine evidence-based concepts of medication reconciliation & nursing informatics to promote quality resulting in reduced adverse drug reactions.

Background

- Medication reconciliation is required on admission to acute care facilities to ensure that orders for inpatient medications reflect thoughtful consideration of the patient's home medications, and that medications ordered on admission are adjusted accordingly (The Joint Commission, 2011b).

- Despite the regulatory requirement, many patients do not have an accurate list of medications collected and documented on admission, potentially leading to Adverse Drug Events (ADEs) (Clancy 2006; IHI, 2008; ISMP, 2005; Mansur, n.d; McGaw, Conner, Delate, Chester, & Barnes, 2007; Poole, Chainakul, Pearson, & Graham, 2006; Pronovost et al., 2003; Schnipper et al., 2009; & Stefan, 2010).

Joint Commission Regulations

The goal of medication reconciliation is to:

1. Obtain information on the medications the patient is currently taking when he or she is admitted to the hospital.

2. Compare the medication information the patient brought to the hospital with the medications ordered for the patient by the hospital in order to identify and resolve discrepancies

(The Joint Commission, 2011b)

Joint Commission Regulations

3. Provide the patient (or family as needed) with written information on the medications the patient should be taking when he or she is discharged from the hospital (name; dose; route; frequency; purpose).

4. Explain the importance of managing medication information to the patient when he or she is discharged from the hospital or at the end of an outpatient encounter.

(The Joint Commission, 2011b)

Meaningful Use & Medication Reconciliation

- Despite previous regulatory efforts, patient-centered, technology-enabled medication reconciliation is still not a consistent reality

- Menu-set option in MU1 in order to promote adoption of a technology-enabled process through financial incentives

- Becomes a Core Objective in MU2 with EP & EH needing to demonstrate compliance with 50% of all TOC

Retrieved from:
http://www.healthit.gov/sites/default/files/meaningfulusetablesseries2_110112.pdf

Our Journey

"Old" Process & Workflow - Admission

- RN captures "home" meds on paper Admission Database
  - Source: Typically the patient
- Provider captures "home" meds on H&P
  - Source: Old records, multiple sources
  - Neither discipline sees the other's list
  - Pharmacy never sees either list
- Provider orders inpatient meds via CPOE
  - Pharmacy verifies
  - RN administers meds
- No independent double-check or cross check

Reality of the hand-written chart

H&P Provider Home Med List

"Old" Process & Workflow - Discharge

- Provider writes out list of home medications on middle panel of paper discharge form
- RN re-writes med list on right panel of tri-fold form
  - The provider is to have manually reviewed the H&P & current active order in CPOE to create list
  - The RN is to have verified the provider list & compare to Admission Database, CPOE, & H&P
  - Second RN to verify process

Patient Discharge Med List- Provider

Mission . . . what about Vision?

- Meet the 2006 Joint Commission Medication Reconciliation requirement

- Utilize grant monies to purchase medication reconciliation software and implement

- Roll-out in 2007

- Pharmacy to manage

Early Challenges

- No medication reconciliation software was available for purchase as a stand-alone or add-on solution for the existing CPOE

- Decision was made to create a novel system

- The Joint Commission mandate was delayed as many organizations struggled to meet the mandate

Early Challenges

- Development took 18 months
- Initial product was released in late 2008, clinician validation found user interface cumbersome & redesign was needed
  - The Joint Commission extended the implementation date to January 2009
  - Programmers and pharmacy leaders did not include end-users in design
  - Goal was to meet regulation, *not usability*

Implementation Challenges

- Due to the delay and initial lack of front-line staff input, a pilot was conducted

- Patient safety issues identified during pilot

- Three months spent fixing – pilot again

- Success!!! July of 2011 . . . Just in time?
  - Flaw – No edit feature

Workflow Changes
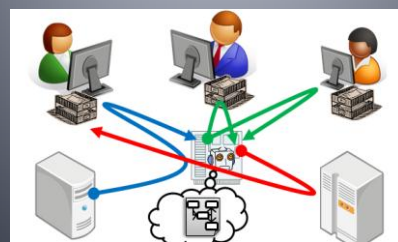
The New Admission Process

Adding Meds – Pick List

Visible "Face-up" Revision Tracking

Attestation - Interdisciplinary

Attestation Complete

Discharge Reconciliation

Final Medication List

Patient-Centered Discharge Form

Outcomes

Medication Reconciliation Adverse Drug Events

	Quarter 1	Quarter 2
2011	25	16
2012	18	12
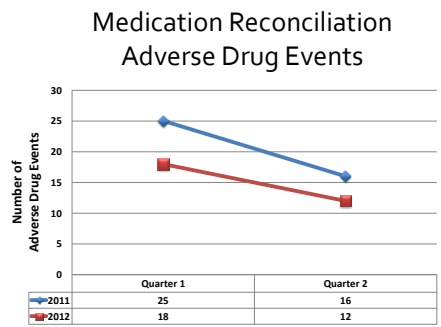
Informatics & the Sociotechnical Process

Informaticians are prepared to influence, contribute to, and mold the realization of an organization's vision for knowledge management.

McLane & Turley, 2011
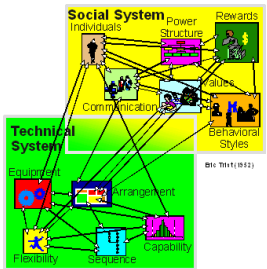
Research – Key Findings

- Communication is essential.
  (AHRQ, 2011; ISMP, 2005; Pronovost; 2003; Poole et al., 2007; Schnipper et al., 2009)
- Interdisciplinary cross-checks, independent redundancy, independent double checks
  (AHRQ, n.d.; Poole, et al. (2006), McGaw et al. (2007), and Schnipper et al. (2009)
- Integrated electronic process is critical
- Focus has been on discharge process, not admission. Complete data on transitions is essential.
  (Greenwald et al, 2010; McGaw et al., 2007; Poole et al., 2007 Schnipper et al., 2009)
- Need more data about environment & process on admission (Poole, 2007; Schnipper et al., 2009)

Cognitive Framework - Analysis

G. Octo Barnett's 10 HIT Commandments

1. **Know what you want to do**
2. Thou shall construct modular systems - given chaotic nature of hospitals
3. Thou shall build a computer system that can evolve in a graceful fashion
4. Thou shall build a system that allows easy and rapid programming development and modification
5. Thou shall build a system that has consistently rapid response time and is easy for the non-computernik to use

(Silverstein, 2011)

Cognitive Framework Analysis

6. Thou shall have duplicate hardware systems
7. **Thou shall build and implement your system in a joint effort with real users in a real situation with real problems**
8. Thou shall be concerned with realities of the cost and projected benefit of the computer system
9. **Innovation in computer technology is not enough; there must be a commitment to the potentials of radical change in other aspects of healthcare delivery, particularly those having to do with organization and manpower utilization**
10. Be optimistic about the future, supportive of good work that is being done, passionate in your commitment, but always guided by a fundamental skepticism.

(Silverstein, 2011)

Conclusions

- Ensuring that usability through direct input from front-line clinical staff is a priority during design phase (ISMP, 2005; Leviss, 2010; Silverstein, 2011)

- Change management with support of administration, clinical informatics, physicians and nurses, and IT are as important, if not more so, than the software or system itself (Greenwald et al., 2010; Koppel & Kreda, 2009; IOM, 2012; Silverstein, 2011; Weir 2009).

- Weir et al. (2009) confirm this view by stating:

 "A sociotechnical perspective is essential. Technology and the institution must be viewed as an indivisible whole and change as an emergent property to properly answer the question of how to transform an institution into a 21st-century health care institution" (p. 391).

Final Thought

- *Computers are incredibly fast, accurate and stupid; humans are incredibly slow, inaccurate and brilliant; together they are powerful beyond imagination." - Author Unknown*

Source: http://www.benshoemate.com/2008/11/30/einstein-never-said-that/

Questions?

References

Agency for Healthcare Research and Quality (2011, April). *Enabling medication management through health information technology: Executive summary* (No. 11-E008-1). Rockville, MD. Retrieved from http://www.ahrq.gov/clinic/tp/medmgttp.htm

Agency for Healthcare Research and Quality (n.d.). TeamSTEPPS® Essentials Course. Retrieved from http://www.ahrq.gov/teamsteppstools/instructor/essentials/index.html

Clancy, C. M. (2006, July/August). AHRQ: Medication reconciliation: Progress realized, challenges ahead. *Patient Safety & Quality Healthcare.* Retrieved from http://www.psqh.com/julaug06/ahrq.html

Greenwald, J. L., Halasyamani, L., Greene, J., LaCivita, C., Stucky, E., Benjamin, B., . . . Williams, M. V. (2010). Making inpatient medication reconciliation patient centered, clinically relevant and implementable: A consensus statement on key principles and necessary first steps. *Journal of Hospital Medicine, 5*(8), 477-485. doi: 10.1002/jhm.849

Institute for Healthcare Improvement (2008, October 1). 5 million lives getting started kit: Preventing adverse drug events (medication reconciliation), how-to guide. Retrieved from http://www.ihi.org/knowledge/Pages/Tools/HowtoGuidePreventAdverseDrugEvents.aspx

Institute for Safe Medication Practices (2005). Medication safety alert: Building a case for medication reconciliation. Retrieved from http://www.ismp.org/newsletters/acutecare/articles/20050421.asp

Institute of Medicine: Committee on Quality of Health Care in America. (1999). *To err is human: Building a safer health system.* Kohn L., Corrigan J., Donaldson M. (Eds.). Washington, DC: National Academies Press.

Institute of Medicine. (2012). *Health IT and Patient Safety: Building Safer Systems for Better Care.* Washington, DC: The National Academies Press.

Koppel, R., & Kreda, D. (2009). Health care information technology vendors' "hold harmless" clause. *JAMA: The Journal of the American Medical Association, 301*(12), 1276-1278. doi: 10.1001/jama.2009.398

Leviss, J. (2010). *H.I.T. or miss: Lessons learned from health information technology implementations.* Chicago: American Health Information Management Association Press.

References

Mansur, J. M. (n.d.). *Enhanced medication safety.* Retrieved from http://www.jointcommissioninternational.org/Medication-Safety-Articles/

McLane, S & Turley, J. P. (2011). Informaticians: How they may benefit your healthcare organization. *Journal of Nursing Administration (41)*1, 29-35.

McGaw, J., Conner, D. A., Delate, T. M., Chester, E. A., & Barnes, C. A. (2007). A multidisciplinary approach to transition care: A patient safety innovation study. *Perm J, 11*(4), 4-9.

National Health Service (2009a). Application of clinical risk management to the manufacture of health software. Retrieved from http://drexel.blackboard.com

National Health Service (2009b). Guidance of the management of clinical risk relating to the deployment and use of health software. Retrieved from http://drexel.blackboard.com

Poole, D. L., Chainakul, J. N., Pearson, M., Graham, L. (2006). Medication reconciliation: a necessity in promoting safe hospital discharge. *Journal for Healthcare Quality, 28*(3), 12-19.

Pronovost, P., Weast, B. . . . Lipsett, P. (2003). Medication reconciliation: a practical tool to reduce the risk of medication errors. *Journal of Critical Care, 18*(4), 201-205. Retrieved from http://ovidsp.ovid.com.ezproxy2.library.drexel.edu/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=ovftf&AN=00009772-200312000-00001

References

Schnipper, J. L., Hamann, C., Ndumele, C. D., Liang, C. L., Carty, M. G., Karson, A. S., . . . Gandhi, T. K. (2009). Effect of an electronic medication reconciliation application and process redesign on potential adverse drug events: a cluster-randomized trial. *Archives of Internal Medicine,* (8), 771-780. Retrieved from http://www.mrw.interscience.wiley.com/cochrane/clcentral/articles/966/CN-00681966/frame.html

Silverstein, S. M. (2011). INFO731 organizational & social issues in medical informatics perspectives on electronic medical records: A review of social issues [PowerPoint Slides] Retrieved from http://drexel.blackboard.com/webapps/portal/frameset.jsp?tab_id=_2_1&url=%2fwebapps%2fblackboard%2fexecute%2flauncher%3ftype%3dCourse%26id%3d_390760_1%26url%3d

Stefan, S. (2010). Evaluation of clinical metrics: Medication reconciliation, problem list, and discharge instructions. *The Journal of Healthcare Information Management, 24*(4), 21-25 Retrieved from http://www.himss.org/ASP/publications_jhim.asp

The Joint Commission (2011a, July). Facts about the National Patient Safety Goals [Fact Sheet]. Retrieved from http://www.jointcommission.org/facts_about_the_national_patient_safety_goals/

The Joint Commission (2011b). Hospital: 2011 National Patient Safety Goals. Retrieved from http://www.jointcommission.org/hap_2011_npsgs/

Weir, C. R., Hicken, B. L., Rappaport, H., Nebeker, J. R. (2006). Crossing the quality chasm: The role of information technology departments. *American Journal of Medical Quality, 21*, 382-393.

References