AGENDA

Quality, Patient Care and Patient Experience Committee Meeting of the El Camino Hospital Board

Monday, April 4th, 2016, 5:30 p.m.
El Camino Hospital, Conference Room A & B
2500 Grant Road, Mountain View, California

Purpose: The purpose of the Quality, Patient Care, and Patient Experience Committee ("Quality Committee") is to advise and assist the El Camino Hospital (ECH) Board of Directors ("Board") in constantly enhancing and enabling a culture of quality and safety at ECH, and to ensure delivery of effective, evidence-based care for all patients. The Quality Committee helps to assure that excellent patient care and exceptional patient experience are attained through monitoring organizational quality and safety measures, leadership development in quality and safety methods and assuring appropriate resource allocation to achieve this purpose.

AGENDA ITEM	PRESENTED BY		
1. CALL TO ORDER	David Reeder, Chair Quality Committee		5:30 – 5:31 p.m.
2. ROLL CALL	David Reeder, Chair Quality Committee		5:31 – 5:32
3. POTENTIAL CONFLICT OF INTEREST DISCLOSURES	David Reeder, Chair Quality Committee		5:32 – 5:33
4. CONSENT CALENDAR ITEMS: Any Committee Member may pull an item for discussion before a motion is made.	David Reeder, Chair Quality Committee	*public comment*	**Motion Required** 5:33 – 5:38
Approval: a. Minutes of Quality Committee Meeting - February 29, 2016 b. Draft FY17 Quality Committee Meeting Calendar c. Environment of Care Policies *i. New Policies – (0 Policies)* *ii. Policies with Major Revisions- (1 Policies)* - *6.04 Utility Systems – Equipment Inventory* *iii. Policies with Minor Revisions (8 Policies)* *iv. Policies with no Revisions – Reviewed (5 Policies)* *v. Policies to Archive (1 Policy)* **Information:** d. Pacing Plan e. Patient Story f. Research Article **ATTACHMENT 4**			
5. REPORT ON BOARD ACTIONS	David Reeder, Chair Quality Committee		**Discussion** 5:38 – 5:43

A copy of the agenda for the Regular Committee Meeting will be posted and distributed at least seventy-two (72) hours prior to the meeting. In observance of the Americans with Disabilities Act, please notify us at 650-988-7504 prior to the meeting so that we may provide the agenda in alternative formats or make disability-related modifications and accommodations.

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April 4, 2016

AGENDA ITEM	PRESENTED BY		
6. COMMITTEE CHARTER **ATTACHMENT 6**	David Reeder, Chair Quality Committee		**Discussion** 5:43 – 5:48
7. FINALIZE FY17 COMMITTEE GOALS **ATTACHMENT 7**	David Reeder, Chair Quality Committee	*public comment*	**Possible Motion** 5:48 – 5:58
8. DRAFT FY17 ORGANIZATIONAL GOALS **ATTACHMENT 8**	Daniel Shin, MD, Medical Director of Quality Assurance		**Discussion** 5:58 – 6:08
9. FY16 EXCEPTION REPORT **ATTACHMENT 9**	Daniel Shin, MD, Medical Director of Quality Assurance		**Discussion** 6:08 – 6:28
10. PATIENT AND FAMILY CENTERED CARE THEME **ATTACHMENT 10**	Daniel Shin, MD, Medical Director of Quality Assurance		**Discussion** 6:28 – 6:48
12. PUBLIC COMMUNICATION	David Reeder, Chair Quality Committee		**Information** 6:48 – 6:51
13. ADJOURN TO CLOSED SESSION			6:51 – 6:52
14. POTENTIAL CONFLICT OF INTEREST DISCLOSURES	David Reeder, Chair Quality Committee		6:52 – 6:53
15. CONSENT CALENDAR Any Committee Member may pull an item for discussion before a motion is made.	David Reeder, Chair Quality Committee		**Motion Required** 6:53 – 6:56
Approval: Meeting Minutes of the Closed Session *Gov't Code Section 54957.2.* - February 29, 2016 **Information:** Report related to the Medical Staff quality assurance matters, *Health and Safety Code Section 32155.* - Meeting Minutes of Quality Council February 3, 2016			
16. Report related to the Medical Staff quality assurance matters, *Health and Safety Code Section 32155.* Red Alert and Orange Alert Update	Daniel Shin, MD, Medical Director of Quality Assurance		**Discussion** 6:56 – 7:11
17. Report related to the Medical Staff quality assurance matters, *Health and Safety Code Section 32155.* Greeley Project - Peer Review	Dave Francisco, MD, Medical Director of Obstetrical Services		**Discussion** 7:11 – 7:26

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AGENDA ITEM	PRESENTED BY		
18. RECONVENE OPEN SESSION/REPORT OUT	David Reeder, Chair Quality Committee		7:26 – 7:29
To report any required disclosures regarding permissible actions taken during Closed Session.			
19. ADJOURNMENT	David Reeder, Chair Quality Committee		7:30p.m.

FY 16 Quality Committee Meetings

- **May 2, 2016**
- **June 1, 2016**

a. Minutes of Quality Committee Meeting - February 29, 2016

Minutes of the Open Session of the
Quality, Patient Care and Patient Experience Committee Meeting of the
El Camino Hospital Board
Monday, February 29th, 2016
El Camino Hospital, Conference Rooms A&B
2500 Grant Road, Mountain View, California
Katherine Anderson participated via teleconference from the following address:
Alpha Motoazabu 3-8-48, Motoazabu, Minatu-ku, Tokyo

Members Present	Members Absent	Members Excused
Dave Reeder; Peter Fung, MD; Diana Russell, RN; Jeffrey Davis, MD; Nancy Carragee, Mikele Bunce, Wendy Ron, Alex Tsao, Melora Simon, and Katie Anderson (via teleconference).	Lisa Freeman	Robert Pinsker, MD

A quorum was present at the El Camino Hospital Quality, Patient Care and Patient Experience Committee on the 29th day, February, 2016 meeting.

Agenda Item	Comments/Discussion	Approvals/Action
1. CALL TO ORDER	The meeting of the Quality, Patient Care and Patient Experience Committee of El Camino Hospital (the "Committee") was called to order by Committee Chair Dave Reeder at 5:36p.m.	***None***
2. ROLL CALL	Chair Reeder asked Stephanie Iljin to take a silent roll call.	***None***
3. POTENTIAL CONFLICT OF INTEREST DISCLOSURES	Chair Reeder asked if any Committee member or anyone in the audience believes that a Committee member may have a conflict of interest on any of the items on the agenda. No conflict of interest was reported.	***None***
4. CONSENT CALENDAR ITEMS	Chair Reeder asked if any Committee member wished to remove any items from the consent calendar for discussion. None were noted. **Motion:** To approve the consent calendar (Open Minutes of the February 1, 2016 Meeting and Environmental Policies were approved). **Movant:** Davis **Second:** Russell **Ayes:** Anderson, Davis, Fung, Russell, Bunce, Reeder, Carragee, Simon, Tsao, and Ron. **Noes:** None **Abstentions:** None **Absent:** Freeman	***The Open Minutes of the February 1, 2016 Meeting and Environmental Policies were approved.***

Agenda Item	Comments/Discussion	Approvals/Action
	Excused: Pinsker **Recused:** None	
5. CMO TRANSITION	Chair Reeder updated the Committee on the CMO Transitional Plan & Medical Leadership Team, and clarified the role transfers throughout Dr. Pifer's transition. Dr. Dan Shin will assume all Quality and Patient Centered Care areas, Dr. Dave Francisco will assume On Call and Medical Directors areas, and Dr. Shreyas Mallur, our new Associate Chief Medical Officer, will oversee Quality and Medical Directors at our Los Gatos Campus. Chair Reeder expressed his thanks and appreciation to Dr. Pifer for his diligence in serving the Quality Committee and his steadfast focus on Patient Safety.	
6. REPORT ON BOARD ACTIONS	Chair Reeder reported that the Board is currently focused on the recent land purchase in South San Jose, and the recent Board approval of opening 5 Urgent Care Facilities within the Silicon Valley.	***None***
7. PROPOSED FY17 COMMITTEE GOALS	Dr. Pifer, Chief Medical Officer, reviewed the Proposed FY17 Committee Goals to include: 1. Review the hospital's organizational goals and scorecard and ensure that those metrics and goals are consistent with the strategic plan and set at an appropriate level as they apply to the Quality, Patient Care, and Patient Experience Committee. 2. Biannually review peer review process and medical staff credentialing process. 3. Develop a plan to review exceptions for goals that are being monitored by the management team and report those exceptions to the El Camino board of directors. 4. Review and oversee a plan to ensure the safety of the medication delivery process. The plan should include a global assessment of adverse events and it should include optimizations to the medication safety process using the new iCare tool. Dr. Pifer asked the Committee for feedback and discussion ensued. The Committee asked for the addition of a goal addressing further development of the Patient and Family Centered Care plan.	***None***
8. FY 16 EXCEPTION REPORT	Dr. Pifer, Chief Medical Officer, reviewed the exception report and noted that most metrics have remained stable	***None***

Agenda Item	Comments/Discussion	Approvals/Action
	or improved. Falls improved in December and January and specimen labeling errors remain low. However, surgical site infections increased in November and the metric that remains a priority is medication errors. The exception report showed that December has improved, but medication errors should remain a top priority. Dr. Pifer reported that he and Cheryl Reinking continue to chair weekly medication safety meetings with a large multi-disciplinary team. This team is working on system improvements with medication workflow. Dr. Pifer submitted the Weekly Medication Safety minutes to reflect the current action plans in place. Dr. Pifer asked the Committee for feedback and discussion ensued. * Dr. Pifer asked that Dr. Kemper and Catherine Nalesnik be invited to the April 4th Committee meeting in order to speak to the Surgical Site Infections.	
9. PATIENT AND FAMILY CENTERED CARE UPDATE	Mick Zdeblick, Chief Operating Officer, gave a brief overview of the Patient and Family Centered Care Plan. Mr. Zdeblick reported that since the last Quality Committee meeting senior management held a FY16 & FY17 Priority Setting Retreat. At this retreat all of the efforts required to successfully close out FY16 were reviewed. Major strategic efforts were also outlined. The consensus of the discussion was that now may not be the best time to launch a new endeavor focused on Patient Family Centered Care. Mr. Zdeblick asked the Committee for feedback and discussion ensued. The Committee voiced concern and requested further investigation and development of the Patient and Family Centered Care theme with anticipated implementation by end of FY17.	***None***
10. GREELEY PROJECT REVIEW	Dr. Pifer presented the Greeley Project to the Committee. He further explained that the Greeley Company has been retained to conduct our peer review, and assessment of our Enterprise Scope of Services. Dr. Pifer asked the Committee for feedback and discussion ensued.	
11. PUBLIC COMMUNICATION	None	***None***
12. ADJOURN TO CLOSED SESSION	**Motion:** To adjourn to closed session at 7:12 p.m. **Movant:** Freeman **Second:** Carragee	***A motion to adjourn to closed session at 7:12 p.m. was approved.***

Agenda Item	Comments/Discussion	Approvals/Action
	Ayes: Anderson, Davis, Fung, Russell, Bunce, Reeder, Carragee, Simon, Tsao, and Ron. **Noes:** None **Abstentions:** None **Absent:** Freeman **Excused:** Pinsker **Recused:** None	
13. AGENDA ITEM 18 RECONVENE OPEN SESSION/ REPORT OUT	*Agenda Items 15 – 17 were reported in closed session.* Chair Reeder reported that the February 1, 2016 Quality Committee Closed Minutes were approved. Chair Reeder also noted the upcoming Quality Committee Meeting dates, and upcoming Semi-Annual Board and All Committee Meeting on March 23, 2016.	***None***
14. AGENDA ITEM 19 ADJOURNMENT	There being no further business to come before the Committee, the meeting was adjourned at 7:28p.m.	***None***

Attest as to the approval of the Foregoing minutes by the Quality Committee and by the Board of Directors of El Camino Hospital:

_____

Dave Reeder
Patient Experience Committee

b. Draft FY17 Quality Committee Meeting Calendar

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Mountain View, CA 94040-4378
Phone: 650-940-7000
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Draft #1 - FY 17 Quality Committee Meeting Calendar

Recommended Quality Committee Date	Corresponding Hospital Board Date
No Meeting	July 2016 – No Meetings
August 1, 2016	August 10, 2016
September 5, 2016	September 14, 2016
October 3, 2016	October 12, 2016
**Monday October 31, 2016 or Wednesday, November 2, 2016*	November 9, 2016
December 5, 2016	December 2015 – No meetings
No Meeting	January 11, 2017
January 30, 2017	February 8, 2017
February 27, 2017	March 8, 2017
April 3, 2017	April 12, 2017
May 1, 2017	May 10, 2017
June 5, 2017	June 14, 2017

Environment of Care Policies

SUMMARY OF POLICIES/PROTOCOLS FOR REVIEW AND APPROVAL

NEW POLICIES				
Policy Number	**Policy Name**	**Department**	**Date**	**Summary of Policy Changes**
POLICIES WITH MAJOR REVISIONS				
Policy Number	**Policy Name**	**Department**	**Review or Revised Date**	**Summary of Policy Changes**
	Utility Systems- Equipment Inventory	Utility Management	3/16	Redefining of equipment inventory to high-risk and non-high risk categories
POLICIES WITH MINOR REVISIONS				
Policy Number	**Policy Name**	**Department**	**Review or Revised Date**	**Summary of Policy Changes**
	Fire Safety Management Work Group Responsibilities	Safety Management	3/16	Revised A3
	Employees Responsibility for Fire Prevention	Safety Management	3/16	Included contractors and volunteers to the statement
	Code Red- Fire Response	Safety Management	3/16	Updated locations to include Cedar Pavilion
	Fire Protection Plan	Safety Management	3/16	Wording and location updated to match current building configurations
	Interim Life Safety Measures	Safety Management	3/16	Removed reference to additional fire drills in areas of construction exceeding 3 months
	Fire Drills	Safety Management	3/16	updated language to match current equipment and building configurations
	Reporting Utility Systems or Equipment Failures	Utility Management	3/16	Removal of references to Evergreen and Rose Garden Dialysis
	Utilities Systems or Equipment Failure Response	Utility Management	3/16	Change location where policies are stored to online locations
POLICIES WITH NO REVISIONS - REVIEWED				
Policy Number	**Policy Name**	**Department**	**Review or Revised Date**	
	Fire Safety Management Plan Development	Safety Management	3/16	
	Fire Watch	Safety Management	3/16	
	Utilities Management Plan	Utility Management	3/16	
	Utilities Management Work Group	Utility Management	3/16	
	Employees Responsibilties for Utilities Management	Utility Management	3/16	
POLICIES TO ARCHIVE				
Policy Number	**Policy Name**	**Department**	**DATE ARCHIVE**	
	Reducing Organizational Acquired Illness	Utility Management	3/16	Necessary sections are covered in another policy under Infection Control

- 6.04 Utility Systems – Equipment Inventory

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TITLE:	Utility Management - 6.04 Utility Systems - Equipment Inventory
CATEGORY:	Safety – Environment of Care
LAST APPROVAL:	05/2012

TYPE:	☑ Policy	☐ Protocol	☐ Scope of Service/ADT	
	☐ Procedure	☐ Standardized Process/Procedure		
SUB-CATEGORY:	Utility Management			
OFFICE OF ORIGIN:	Facilities Services			
ORIGINAL DATE:	06/1998			

I. COVERAGE:

All El Camino Hospital staff, medical staff, and volunteers.

II. PURPOSE:

To ensure utility systems and fixed equipment that have an impact on the care of a patient is included in the inventory and are inspected and maintained in a manner consistent with best practices, organizational experience and applicable codes and standards

III. POLICY STATEMENT:

The inventory of utility systems and equipment is to include all building systems and fixed building equipment that supports the care of the patient.

IV. PROCEDURE:

A. The following utility system categories are included in the utilities management plan:
   1. Domestic Water Systems
   2. Electrical - Emergency Power Systems
   3. Electrical - Normal Power Systems
   4. Elevators, Dumbwaiters and Pneumatic Tube Systems
   5. Fire Detection, Alarm, Control & Communication Systems
   6. Heating, Ventilation and Air Conditioning Systems
   7. Medical Information Data Systems
   8. Medical Gas & Vacuum Systems
   9. Natural Gas Systems
   10. Nurse Call Systems
   11. Sewer Systems
   12. Steam Boiler Systems
   13. Telephone & Paging Systems

B. The detailed inventory of Utility Systems and Equipment is maintained according to the department specific policies and procedures in the Facilities Services Engineering Management Database Program.

C. The hospital establishes and uses risk criteria for identifying, evaluating, and creating an inventory of operating components. These criteria address the following:

- High Risk (including Life Support equipment

  The hospital identifies High Risk operating components of utility systems on the inventory for which there is a risk of serious harm or death to a patient or staff member should the component fail. High risk components include life support equipment.

- Infection Control

  The hospital identifies Infection Control operating components of utility systems on the inventory for which there is a risk of infection or harm to a patient or staff member should the component fail.

- Non-High Risk~~Support of the Environment~~

  The hospital identifies Non High Risk operating components of utility systems on the inventory for which there is no risk or harm to a patient or staff member should the component fail.

- ~~Equipment Support~~
- ~~Communication~~

~~D. This Risk Criteria format resides within the TMS Maintenance Management system in Facilities Services. The layout and values are as follows:~~

~~**Utilities Management Asset Risk Criteria**~~

~~**Equipment Support Categories (E)**~~

- ~~Non-Patient Related (Miscellaneous) .....(1)~~
- ~~Communications .....(2)~~
- ~~Climate/ Comfort (Support of the Environment) .....(3)~~
- ~~Patient Related (Miscellaneous) .....(4)~~
- ~~Infection Control .....(5)~~
- ~~Fire/ Life Safety .....(6)~~
- ~~Life Support .....(7)~~

~~**Likelihood of Failure (F)**~~

- ~~Greater Than Five Years .....(1)~~
- ~~Approximately Three Years .....(2)~~
- ~~Approximately One Year .....(3)~~
- ~~Approximately Six Months .....(4)~~

~~- Less Than Three Months .....(5)~~

~~**Impact on the Environment of Care (Failure) (I)**~~

~~- Very Low .....(1)~~
~~- Low .....(2)~~
~~- Medium .....(3)~~
~~- High .....(4)~~
~~- Very High .....(5)~~

~~**Preventive Maintenance Requirement (P)**~~

~~- Not Required .....(1)~~
~~- Annually .....(2)~~
~~- Semi-Annually .....(3)~~
~~- Quarterly .....(4)~~
~~- Monthly .....(5)~~
~~- Bi-Weekly .....(6)~~
~~- Weekly .....(7)~~

~~**Environmental Use Classification (U)**~~

~~- Non-Patient Care Areas .....(1)~~
~~- Treatment/ Procedure/ Support/ Exam Areas .....(2)~~
~~- General Patient Care Areas .....(3)~~
~~- Critical Care Areas/ Emergency Services .....(4)~~
~~- Surgical Areas .....(5)~~

V. APPROVAL:

APPROVING COMMITTEES AND AUTHORIZING BODY	APPROVAL DATES
Utility Management Work Group	01/2016
Central Safety Committee:	02/09/2016
ePolicy Committee:	
Operations Committee:	
Board of Directors:	
Historical Approvals:	*4/01, 11/03, 8/06, 06/09, 04/12*

Pacing Plan

QUALITY, PATIENT CARE AND PATIENT EXPERIENCE COMMITTEE

FY2016 PACING PLAN (Revised 4.4.16)

FY2016: Q1		
JULY - No Meeting	**AUGUST 3, 2015**	**AUGUST 31, 2015**
Routine Consent Calendar Items: ▪ Approval of Minutes ▪ FY 2016 Committee Goal Completion Status ▪ Pacing Plan ▪ Quality Council Minutes ▪ Patient Story ▪ Research Article	▪ Review and discuss quality summary with attention to risks and overall performance ▪ Corporate scorecard trending **Standing Agenda Items:** ▪ Consent Calendar ▪ Exception Report ▪ Patient Centered Care Plan ▪ Drilldown on Quality Program ▪ Red and Orange Alert as Needed **Info: Research Article & Patient Story**	▪ APPROVE FY 2016 Organizational Goals (Metrics) ▪ Approve FY 15 Organizational Goal Achievements ▪ Update on PaCT Plan ▪ Year-end review of RCA **Standing Agenda Items:** ▪ Consent Calendar ▪ Exception Report ▪ Patient Centered Care Plan ▪ Drilldown on Quality Program ▪ Red and Orange Alert as Needed **Info: Research Article & Patient Story**
FY2016: Q2		
OCTOBER 5, 2015	**NOVEMBER 2, 2015**	**DECEMBER 7, 2015**
▪ Safety Report for the Environment of Care (consent calendar) **Standing Agenda Items:** ▪ Consent Calendar ▪ Exception Report ▪ Patient Centered Care Plan ▪ Drilldown on Quality Program ▪ Red and Orange Alert as Needed **Info: Research Article & Patient Story**	▪ Committee Goals for FY16 Update ▪ ICare Update **Standing Agenda Items:** ▪ Consent Calendar ▪ Exception Report ▪ Patient Centered Care Plan ▪ Drilldown on Quality Program ▪ Red and Orange Alert as Needed **Info: Research Article & Patient Story**	▪ iCare Update **Standing Agenda Items:** ▪ Consent Calendar ▪ Exception Report ▪ Patient Centered Care Plan ▪ Drilldown on Quality Program ▪ Red and Orange Alert as Needed **Info: Research Article & Patient Story**

QUALITY, PATIENT CARE AND PATIENT EXPERIENCE COMMITTEE

FY2016 PACING PLAN (Revised 4.4.16)

FY2015: Q3		
JANUARY – No Meeting	**FEBRUARY 1, 2016**	**FEBRUARY 29, 2016**
	▪ Patient and Family Centered Care ▪ Service Line Update ▪ Top Risk Case Review **Committee Members to complete on-line self-assessment tool.* **Standing Agenda Items:** ▪ Consent Calendar ▪ Exception Report ▪ Patient Centered Care Plan ▪ Drilldown on Quality Program ▪ Red and Orange Alert as Needed **Info: Research Article & Patient Story**	▪ Begin Development of FY 2017 Committee Goals (3-4 goals) ▪ Peer Review/Care Review Process ▪ Top Risk Case Review **Standing Agenda Items:** ▪ Consent Calendar ▪ Exception Report ▪ Patient Centered Care Plan ▪ Drilldown on Quality Program ▪ Red and Orange Alert as Needed **Info: Research Article & Patient Story**
FY2016: Q4		
APRIL 4, 2016	**MAY 2, 2016**	**JUNE 1, 2016**
▪ Finalize FY 2017 Committee Goals ▪ Proposed Committee meeting dates for FY2017 ▪ Review DRAFT FY2017 Organizational Goals ▪ Annual Review of Committee Charter ▪ Top Risk Case Review **Standing Agenda Items:** ▪ Consent Calendar ▪ Exception Report ▪ Patient Centered Care Plan ▪ Drilldown on Quality Program ▪ Red and Orange Alert as Needed **Info: Research Article & Patient Story**	▪ Review DRAFT FY17 Organizational Goals (as needed) ▪ Set proposed committee meeting calendar for FY 2017 ▪ Review Committee Assessment Results ▪ Top Risk Case Review **Standing Agenda Items:** ▪ Consent Calendar ▪ Exception Report ▪ Patient Centered Care Plan ▪ Drilldown on Quality Program ▪ Red and Orange Alert as Needed **Info: Research Article & Patient Story**	▪ PFAC Update (6 months since Jan) ▪ Review and Discuss Self-Assessment Results ▪ Develop Pacing Calendar for FY17 ▪ Top Risk Case Review **Standing Agenda Items:** ▪ Consent Calendar ▪ Exception Report ▪ Patient Centered Care Plan ▪ Drilldown on Quality Program ▪ Red and Orange Alert as Needed **Info: Research Article & Patient Story**

Patient Story

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Patient Story

An elderly patient was brought in to the Emergency Department one evening by his family and was seen by Dr. Ryan Collins. The patient could be released to go home because the initial clinical (physical) exam was not otherwise striking, though his lab work did have a slight abnormality. After examining the patient again and speaking with the family, Dr. Collins stated that "there's something about you and I don't feel comfortable sending you home." The patient was adamant about going back to his family and wanted to go home. He stated, "I do not take directions from anyone!" Dr. Collins responded to the patient "I am not leaving here until you agree to stay" and talked to the patient until midnight. Dr. Collins was successful in convincing his to stay; after 12 hours in the Emergency Department, the patient's blood culture came back positive for Staphylococcus aureus and was diagnosed with sepsis and an infected hip prosthesis.

It is truly wonderful to have such a dedicated (and patient-centric) physician in our Emergency Department, we cannot imagine the progression of the disease if the patient left the ED and had to be brought to another hospital with full-blown sepsis!

Sepsis is a serious medical condition caused by an overwhelming immune response to infection. Immune chemicals released into the blood to combat the infection trigger widespread inflammation, which leads to blood clots and leaky vessels. This results in impaired blood flow, which damages the body's organs by depriving them of nutrients and oxygen. If sepsis progresses to septic shock, blood pressure drops dramatically, which may lead to death. Anyone can develop sepsis, but it's most common and most dangerous in older adults or those with weakened immune systems. Diagnosing sepsis can be difficult because its signs and symptoms can be very similar to other disorders. Often times, sepsis presents with minimal symptoms and sign.

El Camino has a Sepsis Program aimed at early identification of sepsis, and using evidence-based standardized procedures for the prevention and treatment of sepsis. We also have the advanced ability to use noninvasive cardiac output monitoring (NICOM) — a mobile electronic device with stick-on sensors for the chest — to detect changes in blood flow and determine whether tissues are getting enough oxygen. This type of monitoring allows clinicians to quickly determine specific interventions necessary for the patient, such as intravenous (IV) fluid or medications to maintain blood pressure.

The Emergency Department is one window into our Sepsis Program that has made a difference in the health and outcomes of our patients. While most hospitals report sepsis

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mortality rates of more than 20 percent, our rate has consistently been below that for more than five years.

Research Article

PSNet
PATIENT SAFETY NETWORK

Patient Safety Primer Last Updated: March 2015

Medication Errors

Background and definitions

Prescription medication use is widespread, complex, and increasingly risky. Clinicians have access to an armamentarium of more than 10,000 prescription medications, and nearly one-third of adults in the United States take 5 or more medications. Advances in clinical therapeutics have undoubtedly resulted in major improvements in health for patients with many diseases, but these benefits have also been accompanied by increased risks. An adverse drug event (ADE) is defined as harm experienced by a patient as a result of exposure to a medication, and ADEs account for nearly 700,000 emergency department visits and 100,000 hospitalizations each year. ADEs affect nearly 5% of hospitalized patients, making them one of the most common types of inpatient errors; ambulatory patients may experience ADEs at even higher rates. Transitions in care are also a well-documented source of preventable harm related to medications.

As with the more general term adverse event, the occurrence of an ADE does not necessarily indicate an error or poor quality care. A *medication error* refers to an error (of commission or omission) at any step along the pathway that begins when a clinician prescribes a medication and ends when the patient actually receives the medication. *Preventable adverse drug events* result from a medication error that reaches the patient and causes any degree of harm. It is generally estimated that about half of ADEs are preventable. Medication errors that do not cause any harm—either because they are intercepted before reaching the patient, or by luck—are often

called *potential ADEs*. An *ameliorable ADE* is one in which the patient experienced harm from a medication that, while not completely preventable, could have been mitigated. Finally, a certain percentage of patients will experience ADEs even when medications are prescribed and administered appropriately; these are considered *adverse drug reactions* or *non-preventable ADEs* (and are popularly known as *side effects*).

For example, the intravenous anticoagulant heparin is considered one of the highest-risk medications used in the inpatient setting. Safe use of heparin requires weight-based dosing and frequent monitoring of tests of the blood's clotting ability, in order to avoid either bleeding complications (if the dose is too high) or clotting risks (if the dose is inadequate). If a clinician prescribes an incorrect dose of heparin, that would be considered a medication error (even if a pharmacist detected the mistake before the dose was dispensed). If the incorrect dose was dispensed and administered, but no clinical consequences occurred, that would be a potential ADE. If an excessively large dose was administered and was detected by abnormal lab results, but the patient experienced a bleeding complication due to clinicians failing to respond appropriately, it would be considered an ameliorable ADE (that is, earlier detection could have reduced the level of harm the patient experienced).

Risk factors for adverse drug events

There are patient-specific and drug-specific risk factors for ADEs. Polypharmacy—taking more medications than clinically indicated—is likely the strongest risk factor for ADEs. Elderly patients, who take more medications and are more vulnerable to specific medication adverse effects, are particularly vulnerable to ADEs. Pediatric patients are also at elevated risk, particularly when hospitalized, since many medications for children must be dosed according to their weight. Other well-documented patient-specific risk factors include limited health literacy and numeracy (the ability to use arithmetic operations for daily tasks), both of which are independently associated with ADE risk. It is important to note that in ambulatory

care, patient-level risk factors are probably an under-recognized source of ADEs. Studies have shown that both caregivers (including parents of sick children) and patients themselves commit medication administration errors at surprisingly high rates.

The Institute for Safe Medication Practices maintains a list of high-alert medications—medications that can cause significant patient harm if used in error. These include medications that have dangerous adverse effects, but also include look-alike, sound-alike medications, which have similar names and physical appearance but completely different pharmaceutical properties. The Beers criteria, which define certain classes of medications as potentially inappropriate for geriatric patients, have traditionally been used to assess medication safety. However, the newer STOPP criteria (Screening Tool of older Person's inappropriate Prescriptions) have been shown to more accurately predict ADEs than the Beers criteria, and are therefore likely a better measure of prescribing safety in the elderly.

Though there are specific types of medications for which the harm generally outweighs the benefits, such as benzodiazepine sedatives in elderly patients, it is now clear that most ADEs are caused by commonly used medications that have risks, but offer significant benefits if used properly. These medications include antidiabetic agents (e.g., insulin), oral anticoagulants (e.g., warfarin), and antiplatelet agents (such as aspirin and clopidogrel). Together, these four medications—which are not considered inappropriate by the Beers criteria—account for nearly 50% of emergency department visits for ADEs in Medicare patients. Focusing on improving prescribing safety for these necessary but higher-risk medications may reduce the large burden of ADEs in the elderly to a greater extent than focusing on use of potentially inappropriate classes of medications.

Prevention of adverse drug events

The pathway between a clinician's decision to prescribe a medication and the patient actually receiving the medication consists of several steps:

- Ordering: the clinician must select the appropriate medication and the dose and frequency at which it is to be administered.
- Transcribing: in a paper-based system, an intermediary (a clerk in the hospital setting, or a pharmacist or pharmacy technician in the outpatient setting) must read and interpret the prescription correctly.
- Dispensing: the pharmacist must check for drug–drug interactions and allergies, then release the appropriate quantity of the medication in the correct form.
- Administration: the correct medication must be supplied to the correct patient at the correct time. In the hospital, this is generally a nurse's responsibility, but in ambulatory care this is the responsibility of patients or caregivers.

While the majority of errors likely occur at the prescribing and transcribing stages, medication administration errors are also quite common in both inpatient and outpatient settings. Preventing medication errors requires specific steps to ensure safety at each stage of the pathway (Table).

Table. Strategies to prevent adverse drug events

STAGE	SAFETY STRATEGY
Prescribing	• Avoid unnecessary medications by adhering to conservative prescribing principles • Computerized provider order entry, especially when paired with clinical decision support systems • Medication reconciliation at times of transitions in care
Transcribing	• Computerized provider order entry to eliminate handwriting errors

Dispensing	• Clinical pharmacists to oversee medication dispensing process • Use of "tall man" lettering and other strategies to minimize confusion between look-alike, sound-alike medications
Administration	• Adherence to the "Five Rights" of medication safety (administering the Right Medication, in the Right Dose, at the Right Time, by the Right Route, to the Right Patient) • Barcode medication administration to ensure medications are given to the correct patient • Minimize interruptions to allow nurses to administer medications safely • Smart infusion pumps for intravenous infusions • Patient education and revised medication labels to improve patient comprehension of administration instructions

Although each of the strategies enumerated in the Table can prevent ADEs when used individually, fundamentally, improving medication safety cannot be divorced from the overall goal of reducing preventable harm from all causes. Analysis of serious medication errors invariably reveals other underlying system flaws, such as human factors engineering issues and impaired safety culture, that allowed individual prescribing or administration errors to reach the patient and cause serious harm. Integration of information technology solutions (including computerized provider order entry and barcode medication administration) into "closed-loop" medication systems holds great promise for improving medication safety in hospitals, but the potential for error will remain unless these systems are carefully implemented and these larger issues are addressed.

Current Context

Preventing ADEs is a major priority for accrediting and regulatory agencies. The Joint Commission has named improving medication safety as a National Patient Safety Goal for both hospitals and ambulatory clinics, and more recently, the Partnership for Patients has included ADE prevention as one of its key goals for improving patient safety. The Partnership for Patients has set a goal of reducing preventable ADEs in

hospitalized patients by 50% by 2013, estimating that more than 800,000 ADEs could be prevented if this goal is met.

Editor's Picks

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May I Have Another?—Medication Error

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Multifactorial Medication Mishap

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Finding Fault With the Default Alert

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Bad Writing, Wrong Medication

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Medication Overdose

JOURNAL ARTICLE › STUDY

Characterising the complexity of medication safety using a human factors approach: an observational study in two intensive care units.

Carayon P, Wetterneck TB, Cartmill R, et al. BMJ Qual Saf. 2014;23:56-65.

JOURNAL ARTICLE › STUDY

Classification of medication incidents associated with information technology.

Cheung KC, van der Veen W, Bouvy ML, Wensing M, van den Bemt PM, de Smet PA. J Am Med Inform Assoc. 2014;21:e63-e70.

JOURNAL ARTICLE › STUDY

Potentially inappropriate medications defined by STOPP criteria and the risk of adverse drug events in older hospitalized patients.

Hamilton H, Gallagher P, Ryan C, Byrne S, O'Mahony D. Arch Intern Med. 2011;171:1013-1019.

JOURNAL ARTICLE › STUDY

Adverse drug events in U.S. adult ambulatory medical care.

Sarkar U, López A, Maselli JH, Gonzales R. Health Serv Res. 2011;46:1517-1533.

JOURNAL ARTICLE › STUDY

Effect of bar-code technology on the safety of medication administration.

Poon EG, Keohane CA, Yoon CS, et al. N Engl J Med. 2010;362:1698-1707.

JOURNAL ARTICLE › STUDY

Medication use leading to emergency department visits for adverse drug events in older adults.

Budnitz DS, Shehab N, Kegler SR, Richards CL. Ann Intern Med. 2007;147:755-765.

JOURNAL ARTICLE › STUDY

Adverse drug events in ambulatory care.

Gandhi TK, Weingart SN, Borus J, et al. N Engl J Med. 2003;348:1556-1564.

JOURNAL ARTICLE › STUDY

The incidence and severity of adverse events affecting patients after discharge from the hospital.

Forster AJ, Murff HJ, Peterson JF, Gandhi TK, Bates DW. Ann Intern Med. 2003;138:161-167.

JOURNAL ARTICLE › STUDY

Medication errors and adverse drug events in pediatric inpatients.

Kaushal R, Bates DW, Landrigan C, et al. JAMA. 2001;285:2114-2120.

JOURNAL ARTICLE › STUDY

Incidence and preventability of adverse drug events in hospitalized patients.

Bates DW, Leape LL, Petrycki S. J Gen Intern Med. 1993;8:289-294.

JOURNAL ARTICLE › STUDY

Incidence of adverse drug events and potential adverse drug events: implications for prevention.

Bates DW, Cullen DJ, Laird N, et al; ADE Prevention Group. JAMA. 1995;274:29-34.

LEGISLATION/REGULATION › ORGANIZATIONAL POLICY/GUIDELINES

Preventing pediatric medication errors.

Sentinel Event Alert. April 11, 2008;(39):1-5.

BOOK/REPORT

Preventing Medication Errors: Quality Chasm Series.

Committee on Identifying and Preventing Medication Errors, Aspden P, Wolcott J, Bootman JL, Cronenwett LR, eds. Washington, DC: The National Academies Press; 2007.

Risk-Based Patient Safety Metrics

Matthew C. Scanlon, MD; Ben-Tzion Karsh, PhD; Kelly A. Saran, MS, RN

Abstract

Patient safety programs require meaningful metrics. Dominant frameworks are based on two safety metrics: one that seeks to identify, measure, and eliminate error and one that seeks to identify, measure, and eliminate injuries. However, non-health care safety programs suggest a third framework, hazard- or risk-based measurement. Error measurement has many limitations, including the issues of error identification, hindsight bias, outcome-based judgment, and reinforcement of blame. Although injury-based metrics might aid the prevention of harm, limitations include poor discrimination of preventability, resulting in misdirected interventions, missed opportunities, and disregard for the systems-based nature of unsafe health care. In contrast, work in safety science allows for a third framework: risk-based patient safety metrics that are consistent with systems thinking in health care. These metrics focus on identifying the underlying hazards or risks in the system that ultimately lead to errors and injuries. In this article we explore the strengths and limitations of these frameworks and describe a practical application of risk-based patient safety metrics.

Introduction

A valid, reliable, and usable system of metrics is integral to any patient safety program. Data related to patient safety can be used for a range of purposes, including the selection of improvement initiatives, measurement of the success of safety improvement efforts, enhanced transparency by public reporting, organizational accreditation, and even contracting and reimbursement. With the increase in patient safety data applications, the importance of the data has increased commensurately.

Several data attributes should be considered in the context of patient safety metrics. First, are the data feasible to collect? Are the collected data reliable and valid? Do the data support their intended use? What is the rationale for using a given patient safety metric? It is the rationale for using a given patient safety metric that underlies the focus of this article. The mere creation or use of patient safety measures does not assure that they will be useful for improving safety and reducing harm. Even worse, invalid measures can lead to poor decisionmaking, whereas measures that do not lead to safety improvements can be viewed as lost opportunity costs.

The two dominant frameworks for patient safety metrics focus on measurement of errors and measurement of injuries.[1, 2] While arguably there is a role for including both of these frameworks, a third model—i.e., metrics focused on hazards or risks—is based on safety science and human factors engineering.[3]

The following discussion explores the strengths and limitations of these frameworks with practical suggestions for the range of patient safety data consumers.

Error-Based Patient Safety Metrics

The work of James Reason and others has clearly identified the role of errors in preventable harm to patients. In the context of patient safety, errors are defined as a failure of a planned action to be completed as intended—i.e., an error of execution—or the use of a wrong plan to achieve an aim ——i.e., an error of planning.[4, 5, 6] These definitions are based on the premise that the goal of health care is to successfully execute the correct plan of care for any given patient. Thus, error-based metrics seek to identify deviations from this health care goal.

The measurement of errors in health care might appear like a reasonable means of assessing safety. First, errors in the delivery of health care are common. Studies of both pediatric and adult populations reveal that medication errors occur in 3.0 to 6.9 percent of inpatients.[7, 8, 9, 10, 11, 12] The relatively high frequency of errors leads to a second potential advantage of measuring errors in health care: errors seem easy to identify and measure. Finally, errors can guide improvements. If errors are the source of unsafe health care, then one needs to prevent the errors.

There are, however, significant limitations inherent in efforts to measure errors. One of the important limitations is the inability to create a meaningful metric or rate. To have a rate that is valid, reliable, and ultimately meaningful, both a numerator and denominator are necessary. In the context of errors, denominators are not necessarily problematic. Medication error rates might utilize denominators of patient days, number of medications dispensed, or number of patient admissions. However, it is entirely possible that an appropriate denominator might not be readily available for calculating an error rate. For instance, any attempt to measure the error rate in infusion pump programming requires a choice between potential denominators, including number of medications infused, number of pumps programmed, number of programmers involved, number of steps in programming process, or even the number of key punches involved in programming.

A greater limitation of error rates in patient safety is the inability to identify a valid and reliable numerator. If an error rate is:

$$\frac{\textbf{Identified errors}}{\textbf{Potential opportunities for that error to occur}}$$

then, the numerator is only as valid and reliable as the means of identification. Unfortunately, there is no valid and reliable means for identifying all errors.

Voluntarily reported events provide one means of identifying errors as a potential numerator. Yet, reported events, by definition, reflect only those events that individuals recognized as an error and then reported. Errors could go unrecognized, particularly by the person committing the error.[13, 14, 15] Reporting itself depends on the ease of use of a reporting system, the organizational culture and its attitude toward reporting of errors (including any consequences of reporting), and the competing demands on a potential reporter.[16] For example, nurses with multiple patient care demands might not realistically have time to report, independent of her/his belief in the importance of reporting.

Cultural issues are also critical to reporting rates. The fear of reprisal or legal action might lead to underreporting.[17, 18] Subsequently, any error metric that used reported events as a numerator would therefore be a rate of reporting and not a true rate of medical error occurrence.[16]

Two other means of identifying errors in health care have been described in the health care setting, although typically, these methods are limited to detecting medication errors and not other types of health care delivery errors: chart review and direct observation of the provision of care in different settings. Chart review has been used in a number of studies to identify errors as a numerator. In order for chart review to identify all errors, the following sequence of events must occur:

Error occurs
→ Every error is recognized by a health care provider.
→ Every error is documented by the provider.
→ Chart in which errors were documented is reviewed.
→ Reviewer recognizes each documented event during review.
→ Error is attributed correctly.

The need for each of these additional steps to occur perfectly makes it less likely that chart review would provide a true numerator to establish an error rate.

Error identification by means of direct observation of health care workers has been reported as successful.[19] Similar to error identification through chart review, correct determination of a numerator of error rates through direct observation is contingent on another sequence of events:

Error occurs
→ Every error occurrence during the observation period is witnessed by an observer.
→ All errors are recognized by the observer as errors.
→ Observer correctly attributes event as error.

The limited likelihood of absolute ascertainment of errors through direct observation suggests this method is also incapable of establishing a true numerator for error rates.

Two important findings have been made when reporting events and chart reviews, and direct observations of the medication process have been compared. First, the different techniques seemed to yield different results based on the phase of the medication process that was being measured.[20, 21, 22] Second, the events found by reporting, chart review, and direct observation appeared to be complementary, rather than redundant.

Ultimately, no valid or reliable method for establishing error rates is available in most health care settings. Therefore, patient safety programs that leverage error rates as their principal safety metric are operating on flawed data that could lead to incorrect prioritization of safety improvement efforts.

Multiple issues are associated with error-based metrics. “Hindsight bias” leads to simplified attributions of the cause of errors.[23, 24] Furthermore, incorrect or inadequate attribution of causality may create the potential for misguided actions to “solve” the wrong problem, resulting in more complicated and less safe systems.[25] This might result in what Cook has called the

"cycle of error," or the medical equivalent of the arcade game "whack-a-mole"——events occur, inadequate evaluation leads to incorrect actions, which gives the misperception of fixing a problem until a new event, potentially created by the actions, pops up in a new setting.[23]

Steps can be taken to minimize hindsight bias, and there are positive benefits of this phenomenon in adaptive learning.[24] However, the use of retrospective analyses colored by hindsight could inadvertently increase a system's complexity. As a result, "improvements" intended to decrease the risk of patient harm might only prevent the same adverse event from recurring, rather than improving overall system safety.

Another limitation of error-based metrics is "judgment based on the outcome of the events." The perception of a sequence of events associated with the administration of anesthesia can be significantly influenced by the outcome of the case, regardless of the actual actions and judgments of the provider.[26] The fact that knowledge of an outcome might influence evaluations of the quality of a decision has very real implications for identifying errors as potential metrics.[24]

Another major limitation of error-based metrics is the emphasis on the performance of individuals without consideration of the larger system in which care is provided. As illustrated by the Systems Engineering Initiative in Patient Safety (SEIPS) model for systems in health care, providers are merely one of five systems elements.[27] Providers (1) attempt to perform tasks (2) using tools and technology (3) in a given environment (4) within the larger context of an organization (5). Any system outcome, whether it is an error or safe care, results from the performance of and interaction between the five system elements, and not solely the performance of the provider. Although an error may be proximally associated with an individual clinician, organizational factors create the circumstances in which the failure occured.[25] These organizational factors have been identified as latent errors that foster an environment in which an active error is more likely to occur.[28, 29]

Error-based metrics can also be influenced by the psychological concept of attribution theory.[30] Well known biases, such as the self serving bias and fundamental attribution error, make it more likely that those in power are likely to blame the clinician on the "sharp end" when patient harm or an error occurs. At the same time, the clinician on the "sharp end" tends to blame the situation or circumstances surrounding the event.[31] Despite any disclaimer that unsafe health care is a "systems problem" of care delivery, the tendency to blame people for errors underscores a final reason why patient safety programs should move beyond a pure focus on error-based metrics.[3]

Finally, any discussion of error-based metrics would be incomplete without recognizing that the concept of "human error" is socially constructed and, therefore, may not be meaningful in many circumstances.[32] Indeed, people attribute causes of unwanted outcomes to "human error," and people make such attributions with all of their biases and under different kinds of pressures. Therefore, calling something "human error" or "error" might not be factually meaningful. Full exploration of this perspective is beyond the scope of this article, but interestingly, it has led some safety scholars to call for "ditching human error."[33, 34]

Despite these limitations, the identification of errors does hold value for a patient safety program. Identified errors can serve several important roles. First, trends in reported events, while not valid as rates of event occurrence, are a potential reflection of an organization's patient safety

culture. Second, identified errors are learning opportunities that might allow for intervention prior to future harm to patients. It should be noted that even if a given hospital chooses to focus on error-based metrics in the face of the discussed limitations, the National Coordinating Council for Medication Error Reporting and Prevention issued a formal statement that there is no value in using error rates to compare hospitals and health care organizations.[35]

Injury-Based Patient Safety Metrics

The second major framework for patient safety metrics focuses on patient injuries. It has been argued that because errors and harm are often unrelated in a cause-effect manner, a patient safety program should focus on the elimination of harm.[1]

Several organizations have proposed indicators that are intended to identify injuries. Following administrative database analysis, the Agency for Healthcare Research and Quality (AHRQ) put forth a set of potential in-hospital complications that might represent patient safety events.[36] Similarly, the Institute for Healthcare Improvement's *100K Lives Campaign* focused specifically on strategies to reduce the incidence of specific patient injuries, including in-hospital cardiac arrest, acute myocardial infarction, adverse drug events, surgical site infection, central venous line infection, and ventilator-associated pneumonia.[37]

The goal of eliminating patient injuries makes injury-based metrics very attractive to a patient safety program. However, injury-based patient safety measures are not without shortcomings. By definition, identification, measurement, and analysis of injuries are reactive, taking place after an injury occurs. Consequently, they are subject to the same limitations as error-based patient safety metrics, including hindsight bias, incorrect attribution, blaming, and failure to consider the complexities of systems.

Additionally**,** not all patient harm is preventable. Unless a tool for identifying injuries is highly predictive for preventable events, resources might be spent identifying, analyzing, and trying to eliminate unpreventable injuries. There is scant literature on the positive predictive value of widely used injury-based measures, such as the AHRQ Patient Safety Indicators (PSIs). Study of these measures in a pediatric population led to AHRQ eliminating several measures from use in children and modifying other of the remaining measures.[38] These shortcomings illustrate an unintended consequence of injury-based metrics, which include events that are not preventable and thus not affected by improvement. In light of the pay-for-performance movement, evaluating hospitals by injury-based metrics—which include false-positive events—may cost the hospitals reimbursement dollars and lead them to misdirect improvement efforts, resulting in lost opportunity costs. For instance, if an injury-based metric identifies a falsely high rate of decubitus ulcers at a hospital, planned changes to Medicare reimbursement would have direct negative influence through incorrectly lowered payments.[39]

The risk to health care providers resulting from the use of injury-based metrics and pay-for-performance reinforces the problem of incorrect attribution of causation. The identification of many of these events depends on documentation and hospital coding in administrative data sets. Therefore, a hospital might admit a patient, preventable harm might occur, and then the patient might be discharged without accurate documentation and coding to reflect the harm event. If this patient were either transferred or admitted to a second hospital that correctly identified the event,

it would be this second hospital that would receive "credit" for causing harm. This limitation of incorrect attribution may disappear since Medicare has implemented a new billing form, the UB-04, to replace the prior UB-92 form and, with this change, a "Present on Admission" indicator has been added.[40] However, until this change in coding practices is fully implemented, hospitals that accept patients from other care facilities are at risk for having harm to patients incorrectly attributed to them.

These issues of false-positive/false-negative identification and incorrect attribution of causality potentially undermines the value of using injuries as a patient safety metric. Ideally, a patient safety program would use injury-based metrics to calculate an injury rate that could be trended. That rate would be:

$$\frac{\textbf{Identified injuries}}{\textbf{Potential opportunities for those injuries to occur}}$$

As with error measures, correct identification of injuries as a numerator may be inherently problematic. Similarly, defining potential opportunities as a reliable denominator may be challenging. Thus, changes in the rate might reflect true changes in the rate of injury occurrence or simply changes in the way the numerator or denominator are collected. The potential lost opportunity costs and inappropriately lower reimbursement under a pay-for-performance system illustrate very practical concerns about the value of injury-based metrics to a patient safety program.

The final criticism of measuring patient harm as a primary metric for patient safety efforts might be viewed as philosophical in nature. By design, the measurement of injuries requires that before anything can be measured and improved, a patient must first be injured. Medical injury is very much a reality in health care, but it is worth raising the question as to whether health care metrics should be based on waiting for harm to occur, rather than attempting to proactively prevent patient injury.

Despite the numerous limitations, the desire to eliminate preventable harm to patients reinforces the need to understand the limitations of injury-based metrics while still learning from injuries. A strategy that couples the improvement opportunities identified by error-based metrics with those identified with injury-based metrics might outweigh the limitations inherent to either method.

Hazard- or Risk-Based Patient Safety Metrics

The term "risk" is used widely in health care. When obtaining informed consent for a procedure, risks may be presented as the chance of undesirable outcomes during the procedure. Risk ratios are used in epidemiology and medical literature to represent the likelihood of a disease or event occurring relative to an exposure. For instance, the risk of a central venous line-associated infection can be presented relative to whether sterile procedure was used during placement. Risk management is an intrinsic part of hospitals and health care organizations, although traditionally its focus has been on protecting organizations from financial loss.[41, 42] However, with a few notable exceptions, the concept of risk and risk-based metrics as understood by human factors engineers and safety scientists remains relatively unexplored in the specific context of patient safety.[3, 43, 44]

The lack of explicit recognition of risk in the context of patient safety does not mean examples are not available. One example that has been identified in both the medical and popular literature relates to central venous line-associated bloodstream infections (CVL BSI).[45, 46] These infections are costly, common, and result in significant harm, lending themselves to a potential injury metric. Historically, CVL BSIs were viewed as largely unpreventable, although a handful of interventions were known to decrease the risk of infection. By treating failure of compliance with these interventions as a risk factor for infections and by implementing a checklist to drive compliance with this "central line bundle," significant reduction of CVL BSIs has been achieved.[46, 47]

Many other known patient safety errors and injuries can be reframed similarly in terms of risks. Other hospital-acquired infections result from lack of proper hand hygiene. Thus, poor hand hygiene is a patient safety risk factor that can be reduced with a resultant decrease in infections. Wrong site surgeries are known to be preventable through use of the universal protocol.[48] Failure to comply with this protocol is a recognizable yet preventable risk; compliance, on the other hand, can reduce or prevent harm.

Outside of health care, safety risk factors are called hazards[49, 50] or the causes of, or circumstances leading to, unwanted outcomes, not the unwanted outcomes themselves (e.g., error or injury). The hazard identification and control approach is the preferred safety approach in non-health care safety programs, with injury surveillance as an important and complementary component. Although not typically viewed from this perspective, health care situations readily lend themselves to a similar risk identification and control approach.

Hazard identification and control is the basis for safety planning procedures for manufacturing. These procedures state, "The design phase of the proposed ISO (1991) safety strategy includes: (1) specification of the limits of parameters of the system, (2) application of a safety strategy, (3) identifications of hazards, (4) assessment of the associated risk, and (5) removal of the hazards or limitations of the risk, as much as practicable."[51]

According to the U.S. Occupational Safety and Health Administration (OSHA), which enforces employee health and safety regulations for all industries, including health care, a successful safety program has four components: (1) management leadership and employee involvement, (2) worksite analysis, (3) hazard prevention and control, and (4) safety and health training. Regarding hazard prevention and control, OSHA states, "Management must provide the resources and authority so all personnel can find the hazards in the worksite and, once found, to eliminate or to control those hazards."[52] Applying these approaches to a health care context, it follows that systematic efforts to identify risk of harm, assess these risks and, whenever possible, eliminate or reduce these risks are a necessary activity for patient safety programs.

As previously mentioned, the concept of identifying risks in health care with subsequent design or redesign is not new to the patient safety literature. Prior publications have focused on the need to leverage these concepts of hazard and risk to achieve sustainable safety improvements.[3, 53] To fully understand these concepts, it is helpful to frame errors, injuries, and risks in the context of health care systems (Figure 1). Both errors and injuries are possible outcomes of the performance of, and interactions between, the five aforementioned systems elements. That is, while a provider attempts to perform a task using tools and technology in a given health care environment within

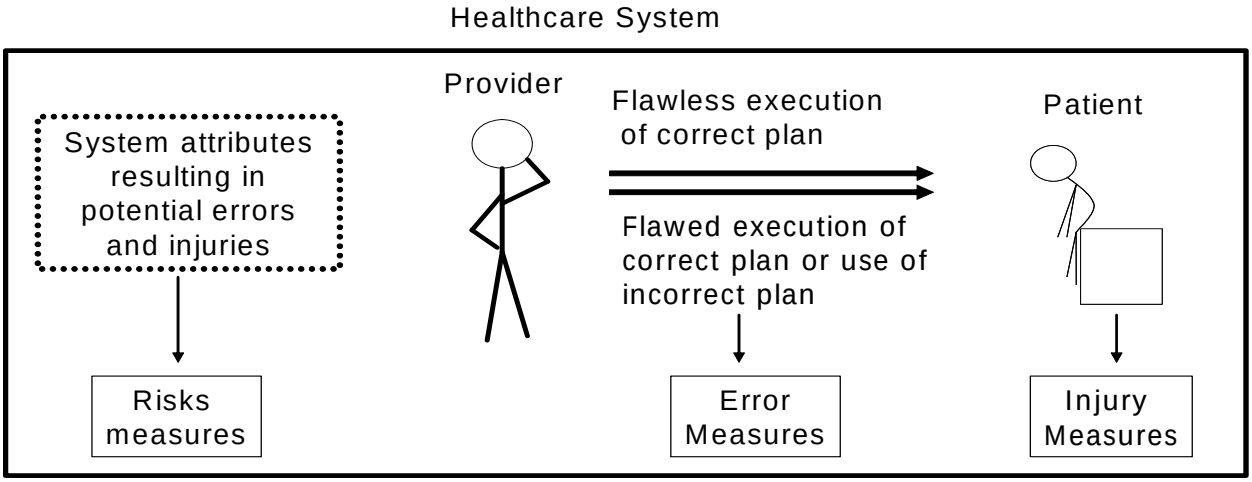

Figure 1. Error, injury, and risk measures in the context of health care systems.

the larger context of an organization, the provider might commit an error that, in some circumstances, causes an injury to a patient.

Another clinical example that illustrates the relationship between systems, risks, errors, and injuries is the use of concentrated potassium on patient care units (Figure 2). A nurse might be directed to administer a diuretic to a patient who is in congestive heart failure on a medical unit. While attempting to obtain the dose of diuretic, the nurse might inadvertently obtain a dose of potassium chloride. Administration of this potentially lethal electrolyte could lead to a life threatening cardiac arrhythmia and cardiac arrest. In this scenario, a specific error might be measured—i.e., incorrectly obtaining and administering potassium chloride rather than a diuretic. Additionally, an injury occurred that might be measured—i.e., the cardiac arrest. However,

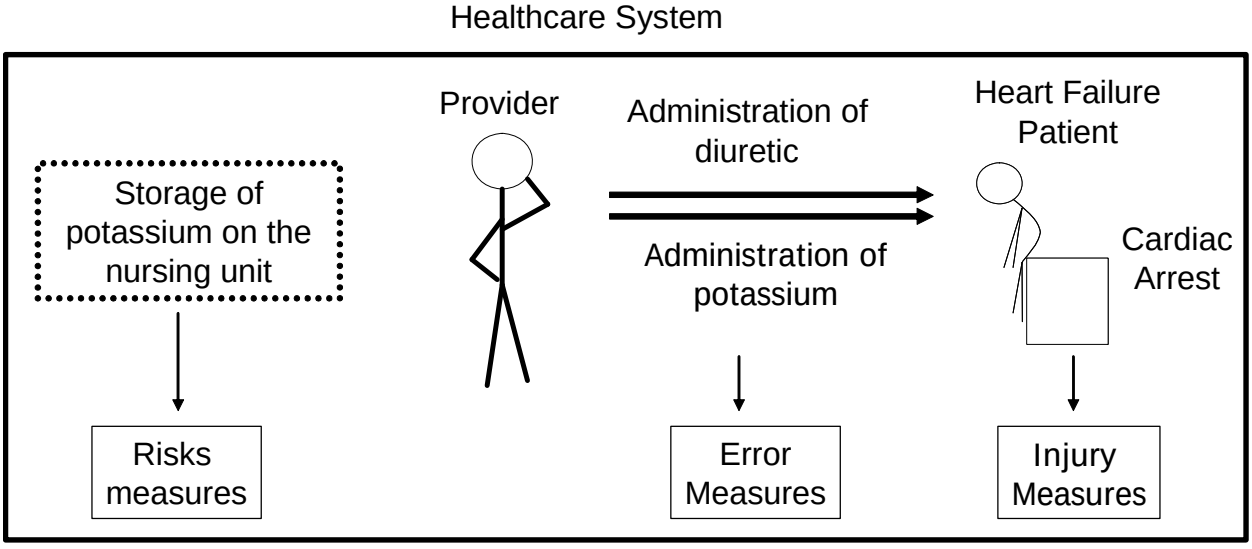

Figure 2. Clinical illustration of systems, errors, injuries, and risks.

patients with congestive heart failure may experience a cardiac arrest independent of medication dosing, and thus, the injury might not ever be correctly associated with the preceding error. Similarly, not every administered dose of potassium chloride will necessarily lead to an arrest. Thus, the error might occur and go undiscovered and unmeasured.

Central to this clinical scenario is the fact that the storage of concentrated potassium on patient care units presents a potential danger to patients, independent of whether a given hospital experiences and identifies a medication error of this nature and the resultant patient injury. That is, the design of a system of health care delivery that results in the storage of potassium on patient care units creates a potentially preventable risk that could be identified, analyzed, and eliminated, regardless of whether a hospital ever experienced either potassium-related errors or injuries.

A shift "upstream" from injuries and errors to safety risk factors (i.e., hazards) provides an alternative rate to the error and injury rates described previously. The risk-based metrics become:

$$\frac{\text{Assessed risks}}{\text{Identified risks}} \quad \textbf{and} \quad \frac{\text{Eliminated risks}}{\text{Assessed risks}} \quad \textbf{resulting in} \quad \frac{\text{Eliminated risks}}{\text{Identified risks}}$$

In the first statement, the denominator is limited only by identification of risks that are relevant to that organization. The numerator is clearer relative to those in error and injury rates. Either a risk has been assessed or not. In the second statement, all assessed risks become the denominator, with a numerator consisting of those assessed risks that have been eliminated. For the sake of simplicity, the first two statements can be combined to create the simple metric of eliminated risks over identified risks at a given health care organization.

Consistent with the limitations of error and injury rates, the denominators in these risk relationships are subject to the limitations of any discovery process used by a patient safety program and, therefore, will never represent all potential risks. The intent of this metric is different from those of errors or injuries. In the case of errors and injuries, the previously discussed metrics are attempts to reflect all errors or harm in a hospital. In the case of the proposed risk metric, the fact that the denominator is "identified risks" clearly suggests that there are other unknown risks. Rather than attempting to represent all risks, this measure instead emphasizes the need to first understand and then eliminate risks in a proactive manner.

Multiple potential implications are involved in adopting such a risk-based metric. First, in keeping with OSHA safety guidelines, organizations are charged with identifying and assessing potential risks. The identification of risks can be accomplished by use of a wide range of data sources. Errors—whether identified by report, chart review, and/or observation—can provide information on potential organizational risks. This is particularly true of "near-miss" and "no-harm" errors, which do not cause harm and yet might herald significant potential harm to patients. Identified injuries also become a source of risk identification, regardless of whether or not the injury is preventable. In using errors and injuries as sources for identifying risk, the rates of errors and injuries are irrelevant. Instead, in keeping with the work of Woods and Cook, [43] the stories behind errors and injuries can be explored with the intent of finding underlying risks.

Other potential sources of risk identification include the published literature, alerts of sentinel events, medical device recalls, and even anecdotal reports from colleagues. One potential source heavily leveraged in non-health care industries is the safety inspection by a safety expert.[49, 50] In other industries, safety and human factors engineers are routinely employed, and part of their job is to conduct periodic and formal hazard inspections, in which the goal is to identify hazards or risk factors for error and injury (e.g., potassium chloride on the unit or a difficult-to-navigate barcoded medication administration system). Health care delivery organizations have yet to embrace such a model.

Risk-based patient safety metrics also have other implications. Adoption of a risk-based metric shifts the focus from reactively evaluating errors and injuries (with all their associated limitations) to proactively seeking out and evaluating risks that might exist. Another implication is the potential value of involving frontline staff who could become part of the process for proactively looking for potential risks.[54] This strategy requires no education of employees of error taxonomies or classification systems of injury severity. At the level of senior management and leadership, using risk-based metrics has a potential psychological benefit. By their nature, the risk-based metrics have a positive connotation; the numerator represents positive acts that have ideally resulted in enhanced safety through the elimination of risk. In contrast, both error- and injury-based metrics essentially provide a count of organizational failures. It is not a great leap to imagine leaders who might value a metric emphasizing and reinforcing improvement over one that provides a reminder of system failures. In turn, shifting any culture of blame to one more consistent with high-reliability organizations has at least a hypothetical benefit.[55]

In each case, an organization can assess each identified potential risk for its relevance to their institution. This assessment might require additional data collection to verify whether the risk exists in the health care delivery setting, as in the case of determining whether a national infusion pump recall is a viable risk to their organization. Additionally, this assessment would likely require the involvement of clinical content experts. In the case of public reports of a type of bacterial infection outbreak in newborn nurseries, the clinical content experts might include infectious disease experts, neonatologists, and infection control specialists. In the case of a medication recall, the content experts might be the ambulatory clinic manager and clinic staff charged with tracking medication samples. Without the involvement of the clinical content experts, an organization might incorrectly determine that a specific risk was present. If a risk did not exist, the organization would have no further action to take beyond periodic surveillance to assure that the risk is not introduced later.

When a risk has been identified and assessed to be relevant to a health care organization, then the next step is elimination of the risk. The science of safety improvement is beyond the scope of this discussion. However, the human factors literature clearly indicates the need to design solutions into the care delivery system to achieve sustained elimination of risks.[3, 53] Although redesigning health care delivery systems is no small undertaking, a patient safety program that incorporated a risk-based approach to measuring and improving safety would be consistent with the existing safety science used in non-health care industries.

A risk-based framework might be nearly universal outside health care, but evidence that it has been attempted in health care is limited. As a result, the conventional wisdom of focusing on errors and/or injuries might win out over what could be viewed as a theoretical argument for

broadening the approach to address risks. However, one illustration of the benefit of systematically focusing on hazards or risk has been published.[54] In this study, the use of a traditional incident reporting system over 5 years yielded a total of 200 reported events, all of which came from nursing. In contrast, a system of identifying hazards (safety risk factors) on the same study units resulted in 359 reports in 12 weeks. At the same time, the range of types of problems reported using the hazard-based system increased significantly, with much greater physician involvement: zero physician reports of incidents during the 5-year period, compared with 29 percent physician reports when the system was changed to a hazard-reporting system. Although generating more reports was not the goal *per se*, the incorporation of a risk-based framework led to greater proactive identification of problems in their hospitals, which in turn, by preventing future harm, allowed for a positive effect.

Additional Applications of Risk-Based Patient Safety Metrics

The proposal of using risk-based patient safety metrics is entirely consistent with learning from identified errors and focusing on the elimination of injuries. As described, a patient safety program that adopts a risk-based approach is also consistent with the science of human factors. However, there are additional potential applications for an organization that adopts a patient safety framework centered on the identification, assessment, and reduction of risk.

One practical application of adopting a risk-based framework is the refocusing of all patient safety activities. Specifically, the primary functions of a patient safety program then become:

1. Identifying risks.
2. Assessing risk through analysis and clinical interpretation.
3. Reducing and eliminating risk through a range of efforts.

Any activity undertaken by the patient safety program can be evaluated in light of these three functions. Education of staff and patients is entirely consistent with risk identification and reduction. Noncompliance with accreditation requirements, such as the Joint Commission's National Patient Safety Goals or the Leapfrog criteria, is also an organizational risk. Thus, assessment of a hospital's performance relative to these goals and steps to correct any deficiencies are entirely consistent with the risk-based framework.

A second practical application of the risk-based approach to a patient safety program is the implementation of patient safety competencies among hospital staff and physicians. A set of patient safety competencies that has been introduced at multiple organizations reinforces the risk-based framework (Personal communication, Nancy Kimmel, PharmD, March 2004). The competencies include: (1) report what you find; (2) fix what you can; and (3) communicate to your supervisor those things you cannot fix.

Essentially, health care staff are encouraged to actively seek out potential risks, even though those risks might not have led as yet to an error or injury; communicate the risks; and eliminate them whenever possible. The competencies can be readily evaluated as part of employee performance review, simply through statements such as, "Tell me about something you reported in the last 3 months"; or "Tell me about a time when you fixed a risk to patients, families, or employees." The continual reinforcement of this process of risk identification, assessment, and

reduction at the individual employee level arguably is consistent with high-reliability organizations.

A final application or benefit of risk-based metrics is reinforcing the alignment between patient safety, risk management, and quality activities at an organization. The coordination of safety, risk management, and quality activities might be unclear within any given health care organization.[56] A patient safety program built around identifying, assessing, and eliminating risks is consistent with existing models of quality improvement and might result in more efficient use of organizational resources.

Conclusion

The practice of patient safety improvement has evolved significantly over the last decade. This evolution reflects both primary patient safety research in the health care setting and a growing appreciation for safety science developed in non-health care settings. In turn, the health care community has applied safety research findings from health care and non-health care settings through changes in care delivery and the introduction of patient safety-oriented technologies. Arguably, sufficient evidence is available to merit similar advancements in the practice of patient safety metrics, with a move beyond reactive measures of systems outcomes (i.e., errors and injuries) to measures of systems risks that ultimately cause the undesirable systems outcomes.

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References

1. Layde PM, Cortes LM, Teret SP, et al. Patient safety efforts should focus on medical injuries. JAMA 2002; 287: 1993-1997.
2. McNutt RA, Abrams R, Aron DC. Patient safety efforts should focus on medical errors. JAMA 2002; 287: 1997-2001.
3. Karsh B, Holden RJ, Alper SJ, et al. A human factors engineering paradigm for patient safety – designing to support the performance of the health care professional. Qual Saf Health Care 2006; 15(Suppl I): i59-i65.
4. Reason J. Human error. New York: Cambridge University Press; 1990.
5. Reason J. Human error: Models and management. Br Med J 2000; 320: 768-770.

6. Reason J. Beyond the organisational accident: The need for "error wisdom" on the frontline. Qual Saf Health Care 2004; 13: 28-33.

7. Brennan TA, Leape LL, Laird NM, et al. Incidence of adverse events and negligence in hospitalized patients. N Engl J Med 1991; 324: 370-376.

8. Dean BD, Allan EL, Barber ND, et al. Comparison of medication errors in an American and British hospital. Am J Hosp Pharm 1995; 52: 2543-2549.

9. Lesar TS, Briceland L, Stein DS. Factors related to errors in medication prescribing. JAMA 1997; 277: 312-317.

10. Bates DW, Boyle DL, Vander VM, et al. Incidence of adverse drug events and potential adverse drug events: Implications for prevention. JAMA 1995; 274: 29-34.

11. Nelson KM, Talbert RL. Drug-related hospital admissions. Pharmacotherapy 1996; 16: 701-707.

12. Folli HL, Poole RL, Benitz WE, et al. Medication error prevention by clinical pharmacists in two children's hospitals. Pediatrics 1987; 79: 718-722.

13. Blavier A, Rouy E, Nyssen A-S, et al. Prospective issues for error detection. Ergonomics 2005; 48: 758-781.

14. Kanse L, Van der Schaaf TW, Vrijland ND et al. Error recovery in a hospital pharmacy. Ergonomics 2006; 49: 503-516.

15. Kontogiannis T. User strategies in recovering from error in man-machine systems. Safety Sci 1999; 32: 49-68.

16. Holden RJ, Karsh B. A review of medical error reporting system design considerations and a proposed cross-level system research framework. Hum Factors 2007; 49: 257-276.

17. Wu AW, Folkman S, McPhee SJ, et al. Do house officers learn from their mistakes? JAMA 1991; 265: 2089-2094.

18. Hobgood C, Weiner B, Tamayo-Sarver JH. Medical error identification, disclosure, and reporting: Do emergency medicine provider groups differ? Acad Emerg Med 2006; 13: 443-451.

19. Barker KN, Flynn EA, Pepper GA, et al. Medication errors observed in 36 health care facilities. Arch Intern Med 2002; 163: 1897-1903.

20. Barker KN, McConnel WE. The problems of detecting medication errors in hospitals. Am J Hosp Pharm 1962; 19: 360-369.

21. Shannon RC, De Muth JE. Comparison of mediation error detection methods in the long term care facility. Consult Pharm 1987; 2:148–151.

22. Flynn EA, Barker KN, Pepper GA, et al. Comparison of methods for detecting medication errors in 36 hospitals and skilled-nursing facilities. Am J Health Syst Pharm 2002; 59: 436-446.

23. Cook RI. A brief look at the new look at complex system failure, error, safety, and resilience. Chicago, IL: Cognitive Technologies Laboratory; 2005. Available at ctlab.org/documents/BriefLookAtTheNewLookVerAA.doc.pdf. Accessed March 25, 2008.

24. Henriksen K, Kaplan H. Hindsight bias, outcome knowledge and adaptive learning. Qual Saf Health Care 2003; 12: 46-50.

25. Karsh B, Brown R. The impact of organizational hierarchies on the design and analysis of medical error research. Proceedings of Human Factors in Organizational Design and Management-VIII; Santa Monica, CA: IEA Press; 2005. p. 293-298.

26. Caplan RA, Posner KL, Cheney FW. Effect of outcome on physician judgments of appropriateness of care. JAMA 1991; 265: 1957-1960.

27. Carayon P, Hundt AS, Karsh B, et al. Work system design for patient safety: The SEIPS model. Qual Saf Health Care 2006; 15(Suppl I): i50-i58.

28. Reason J. Understanding adverse events: Human factors. Qual Health Care 1995; 4: 80-89.

29. Reason J. Safety in the operating theatre - Part 2: Human error and organisational failure. Qual Saf Health Care 2005; 14: 56-60.

30. Kelley HH, Michela JL. Attribution theory and research. Ann Rev Psych 1980; 31: 457-501.

31. DeJoy DM. Managing safety in the workplace: An attribution theory analysis and model. J Safety Res 1994; 25: 3-17.

32. Hollnagel E. Why “human error” is a meaningless concept. Position paper for NATO Conference on Human Error; Bellagio, Italy; 1983. Available at www.ida.liu.se/~eriho/Bellagio_M.htm. Accessed March 25, 2008.

33. Kohn LT, Corrigan JM, Donaldson MS. To err is human: Building a safer health System. Washington, DC: National Academies Press; 2000.

34. Hollnagel E. Human reliability assessment in context. Nuc Eng Tech 2005; 37: 159-166.

35. Council recommendations: Statement from NCCMERP - Use of medication error rates to compare health care organizations is of no value. National Coordinating Council for Medication Error Reporting and Prevention; 2002. Available at www.nccmerp.org/council/council2002-06-11.html. Accessed March 25, 2008.

36. Patient safety indicators overview. AHRQ quality indicators. Rockville, MD: Agency for Healthcare Research and Quality; 2006. Available at: www.qualityindicators.ahrq.gov/psi_overview.htm. Accessed March 25, 2008.

37. The 5 Million Lives Campaign. Cambridge, MA: Institute for Healthcare Improvement. Available at www.ihi.org/IHI/Programs/Campaign/. Accessed March 25, 2008.

38. Scanlon MC, Miller M, Harris JM, et al. Targeted chart review of pediatric patient safety events identified by the AHRQ PSI methodology. J Patient Saf 2006; 2: 191-197.

39. CMS announces payment reforms for inpatient hospital services in 2008. Baltimore, MD: Center for Medicare & Medicaid Services. [Press release]. www.cms.hhs.gov/apps/media/press/release.asp?Counter=2335&intNumPerPage=10&checkDate=&checkKey=&srchType=1&numDays=3500&srchOpt=0&srchData=&srchOpt=0&srchData=&keywordType=All&chkNewsType=1%2C+2%2C+3%2C+4%2C+5&intPage=&showAll=&pYear=&year=&desc=false&cboOrder=date. Accessed March 25, 2008.

40. Are You Ready for the UB – 04? Chicago, IL: Health Information and Management Systems Society. Available at: www.himss.org/content/files/200612_UB-04_FAQs.pdf. Accessed March 25, 2008.

41. Bryant JM, Hagg-Rickert S. Development of a risk management program. In: Carroll R, ed. Risk management handbook for health care organizations, 3rd edition. San Francisco, CA: Jossey-Bass; 2001. p. 46.

42. Vincent C. Introduction. In: Vincent C, editor. Clinical risk management. 2nd edition. London, UK: Br Med J Books; 2001. p. 1.

43. Woods D, Cook RI. Nine steps to move forward from error. Cognition Tech Work 2002; 4: 137-144.

44. Cook RI, Woods D, Miller C. A tale of two stories: Contrasting views of patient safety. National Health Care Safety Council of the National Patient Safety Foundation at the AMA; 1998. p.1-86. Available at www.ctlab.org/documents/A%20Tale%20of%20Two%20Stories.pdf. Accessed March 25, 2008.

45. Gawande A. The checklist. The New Yorker; 2007 Dec 10; 1-8. Available at www.newyorker.com/reporting/2007/12/10/071210fa_fact_gawande. Accessed March 25, 2008.

46. Pronovost P, Needham D, Berenholtz S, et al. An intervention to decrease catheter-related bloodstream infections in the ICU. N Engl J Med 2006; 355: 2725-2732.

47. Berenholtz SM, Pronovost PJ, Lipsett PA, et al. Eliminating catheter-related bloodstream infections in the intensive care unit. Crit Care Med 2004; 32: 2014-2020.

48. Universal protocol for preventing wrong site, wrong procedure, wrong person surgery. Oakbrook Terrace, IL: The Joint Commission; 2003. Available at www.jointcommission.org/NR/rdonlyres/E3C600EB-043B-4E86-B04E-CA4A89AD5433/0/universal_protocol.pdf. Accessed March 25, 2008.

49. Smith MJ, Carayon P, Karsh B. Design for occupational health and safety. In: Salvendy G, ed. Handbook of industrial engineering: Technology and operations management 3rd ed. New York: John Wiley and Sons; 2001. p. 1156-1191.

50. Smith MJ, Karsh B, Carayon P, et al. Controlling occupational safety and health hazards. In: Quick JC, Tetrick LE, editors. Handbook of occupational health psychology. Washington, DC: American Psychological Association; 2003. p. 35-68.

51. Karwowski W, Warnecke HJ, Hueser M, et al. Human factors in manufacturing. In: Salvendy G, ed. Handbook of human factors and ergonomics, 2nd ed. New York: John Wiley and Sons; 1997. p. 1899-1900.

52. Safety and health management systems e-tool. Overview of system components. U.S. Department of Labor, Occupational Safety & Health Administration Available at: www.osha.gov/SLTC/etools/safetyhealth/components.html. Accessed March 25, 2008.

53. Battles JB, Lilford RJ. Organizing patient safety research to identify risks and hazards. Qual Saf Health Care 2003; 12: 2-7.

54. Morag I, Gopher D. A reporting system of difficulties and hazards in hospital wards as a guide for improving human factors and safety. Paper presented at the Human Factors and Ergonomics Annual Meeting. San Francisco, CA; 2006.

55. Weick KE, Sutcliffe KM. Managing the unexpected. San Francisco, CA: Jossey-Bass; 2001.

56. Institute of Medicine. Crossing the quality chasm. Washington, DC: National Academies Press; 2001.

Journal of Pharmacy Practice
2014, Vol. 27(1) 61-64

DOI: 10.1177/0897190013504959
jpp.sagepub.com
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Improving Medication Safety Through the Use of Metrics

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Abstract

Purpose: Describe medication safety metrics used at University HealthSystem Consortium (UHC) institutions and recommend a meaningful way to report and communicate medication safety information across an organization. *Methods:* A cross-sectional study was conducted using an electronically distributed, open-ended survey instrument. *Results:* Twenty percent of the UHC institutions responded to our survey. Seventy-seven percent of those institutions responding to our survey reported their organization has defined metrics to measure medication safety; an additional 21% of the institutions were still in the process of defining metrics. Of metrics that were reported, 33% were true medication safety metrics. Results are distributed to a wide variety of institutional venues. *Conclusion:* Institutions should take several actions related to medication safety including defining local metrics; building metrics addressing preventable adverse drug events, medication errors, and technology; and reporting results to a variety of venues in order to design specific interventions to improve local medication use.

Keywords

medication safety, medication errors, adverse drug events, metrics

Introduction

According to the Institute of Medicine (IOM) report, *Preventing Medication Errors*, approximately 10% of medication orders are subject to an error, and preventable adverse drug events (ie, harm due to a medication error) occur in up to 2% of hospital admissions.[1] The concept of medication safety in hospital settings refers to the prevention, detection, reporting, and response to both medication errors and adverse drug reactions. When either a medication error or an adverse drug reaction contributes to patient harm, it can also be considered an adverse drug event.

Medication errors can occur at any step of the medication management process, with a reported 75% of the errors causing harm occurring during medication prescribing or administration.[2] Medication error reporting and trending have been recognized as crucial elements in raising awareness, identifying system failures, and implementing preventative solutions.[3-5] Realizing the resource requirement for an objective, observation-based error detection system, most organizations opt for voluntary reporting as the primary vehicle for trending medication errors. Voluntary reporting may contribute to variation in reporting rates due to factors such as fear of retribution, ease of reporting, and varied perceived value of reporting. It is important for organizations to identify appropriate metrics (ie, standard aggregate data measurements that assess key issues related to medication safety) that account for the variability in voluntary reporting (eg, not simply reporting the total medication error reports per month or per quarter).[6] Both the Agency for Healthcare Research and Quality (AHRQ) and National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) recommend that medication safety metrics be designed to promote a culture of openness and used to initiate specific changes in the medication use process in order to improve safety.[6,7]

Once meaningful (ie, valuable to the mission and goals of the organization) metrics are identified, all individuals involved in the care of patients should collaborate to understand, identify, and address areas requiring improvement and action. Barriers to effective collaboration may include poor communication among hospital departments and lack of a means to analyze medication safety gaps. Medication safety dashboards may serve as a solution by providing an interdepartmental communication tool

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highlighting high-risk medication practices, allowing for issue identification and action planning.

Many hospitals across the nation have created medication safety dashboards or have included medication safety metrics in their organization's performance score cards. Many factors, including availability and validity of data, intended use of data, and local trends and variability as well as others, must be considered when selecting and communicating metrics.[6] While the use of metrics to assess institutional pharmacy operations, costs, productivities, and clinical activities has been widely described,[8-11] an extensive literature search revealed little specific original research published to date, describing the best practices using metrics to monitor medication safety.

The objective of this project was to survey University HealthSystem Consortium (UHC) hospitals in order to describe current practices in medication safety metrics and, based on the results, recommend a meaningful way to report and communicate medication safety information across institutions by utilizing medication safety metrics.

Methods

UHC, an alliance of academic medical centers focused on performance improvement, consists of 116 academic medical centers, along with their affiliated hospitals, located in 42 states and the District of Columbia. A research group was formed as a subcommittee of the UHC Pharmacy Council Practice Advancement Committee (PPAC) in the spring of 2011.

The research group developed a survey questionnaire over the course of several telephone conferences, which then received peer evaluation and feedback from the PPAC and UHC. Although originally containing more survey items, the resulting 3-item survey questionnaire was designed to be brief and open ended in order to solicit as much feedback and participation as possible. It was determined that the 3 key questions were (1) has your hospital/health-system defined specific medication safety metrics to be reported and trended? (2) where are your medication safety metrics presented? and (3) what medication safety metrics have you found most useful/meaningful within your organization?

For item 2, a number of potential institutional venues (eg, Pharmacy and Therapeutics Committee, Medication Safety Committee) were provided with the option of adding a free-text response. Responders could select as many answers as applied. Item 3 consisted of an open-ended field available to allow responders to list the most meaningful metrics, in their opinion. We grouped responses to item 3 into 1 of 4 domains: adverse drug events, medication errors, technology, and other. Responders were also encouraged to electronically attach their institution's metrics. Finally, individual responder contact information was collected.

The survey questionnaire was distributed electronically to all pharmacy representatives (eg, registered pharmacist employee) of the 227 UHC member institutions during summer 2011. Two reminder e-mails were distributed. Reported survey data were analyzed using Microsoft Excel® 2010. In our data analysis, "true medication safety metrics" were defined as those with a quantifiable numerator and denominator (other than time alone) inherently related to optimizing medication safety (eg, number of bedside bar code scans per number of administered doses).

Results

Representatives from 45 (20%) of the 227 health systems completed the survey. Three additional responders completed the survey without including contact information during the survey time frame; no indicators of duplication (ie, very similar responses between anonymous and self-identified responders) were identified among responses. The completed response represented 27 of the 42 states containing member institutions.

The majority (77%) of the responders indicated that medication safety metrics have been defined at their institution; 21% of the responders indicated that although medication safety metrics have not been defined at their institution, they were in the process of defining those metrics. One (2%) responder reported that their institution has not defined medication safety metrics and has no plans to do so.

Representatives from 34 health systems responded that they are currently reporting metrics to a range of 1 to 8 unique groups per institution. Metrics were most commonly reported at interdisciplinary committees (eg, Medication Safety Committee [97%], Patient Safety Committee [59%], Risk Management [56%], and Quality Committee [47%]), medical staff committees (eg, Pharmacy and Therapeutics Committee [85%]), hospital administration (eg, Medical Executive Committee [44%] and other [38%]) and to the pharmacy department (71%).

When asked which measures of medication safety were the most meaningful for their institution, approximately 33% of these measures represented true medication safety metrics, by our definition; however, these metrics varied greatly among institutions. Table 1 provides a breakdown of medication safety metrics valued at various institutions.

Of the reported useful measures, 67% may not be considered true medication safety metrics based on the definition used in this study; of these, 71% were classified as raw medication error or adverse event data (e.g., total medication errors experienced over a time period) and 11% were more focused on clinical quality improvement, not medication safety explicitly (eg, percentage of patients receiving discharge medication counseling). The remainder was distributed between indirect measures of patient safety (eg, use of unapproved abbreviations), AHRQ Patient Safety Network Measures, and raw adverse drug reaction data.

Discussion

We attempted to describe the use of true medication safety metrics for several reasons. The primary reason is that there is little published information regarding best practice for medication safety metric reporting in general; we also hoped to

Table 1. Medication Safety Metrics.[a]

Metric	Hospitals (no.)
Technology	14
Bar code scans per administered dose	2
Cabinet overrides per relevant order	6
Smart pump use per relevant order	6
Medication errors	7
Medication errors per patient days	3
Medication errors per number of admissions	1
Harmful medication errors per total medication errors	1
Near miss medication errors per number of doses	1
Number of days with no harm from a medication error	1
Adverse drug events	5
Adverse drug events per patient days	3
Adverse drug events per number of admissions	1
Adverse drug events per number of doses	1
Other	4
Medication reconciliation performed per patient	2
Patient Safety Network events per patient days	1
Pharmacist interventions per total orders reviewed	1

[a] Adverse drug event: injury resulting from the use of a drug, may be preventable or nonpreventable; medication error: inappropriate use of a medication on the part of a health care professional, may be harmful or nonharmful.

identify some of the most valued metrics. Previous studies have focused on using metrics to assess institutional pharmacy operations, costs, productivity, and clinical activities[8-11]; this report is novel in that it focuses on describing metrics specific to medication safety. In our experience, we have found those metrics with an identifiable numerator and denominator to provide the most value to organizations in terms of the ability to track and benchmark trends over time. Only 33% of the metrics reported in this study fit this definition.

The NCC MERP does not recommend using medication error rates or metrics for comparison between organizations due to potential differences in culture, definitions, patient populations, and variety in detection and reporting strategy.[7] Rather, medication safety data should be monitored in order to identify specific opportunities for improving the local medication use system. It was interesting to note that many of the identified metrics, particularly those falling into the medication error domain, may be in conflict with NCC MERP recommendations depending on how this information is used. Additionally, the purpose of each metric must be considered. For example, ''near miss medication errors per number of doses'' can be a strong metric if assessed appropriately. This number should ideally increase over time, as health systems improve their culture of reporting. Similarly, metrics focusing on adverse drug events would ideally focus on those where a systems-based initiative may reduce patient risk (ie, preventable adverse drug events).

Departments of pharmacy have employed medication safety officers in order to track and trend medication errors and implement system solutions to prevent future adverse drug events, recognizing the limitations of voluntary reporting. Medication safety officers become even more vital when nonvoluntary means of gathering data (e.g., direct observation, retrospective chart review) are employed. Since the 2006 publication of *Preventing Medication Errors*, hospitals have experienced a significant influx of automation and information technology that guides the medication use process.[1] In light of this trend, and the increased proliferation of medication safety officers, it is essential to reexamine traditional error reporting and determine how we detect, report, and interpret errors in a modern age. Recommendations from AHRQ and NCC MERP support these principles.[6,7] Both AHRQ and NCC MERP suggest building metrics with the intention of promoting a culture of openness and that the data collected should be used to initiate specific changes to the medication use process in order to improve safety.

Several limitations decrease the applicability of these results. First, this study was intended to be qualitative in nature. Our goal was to gather subjective information regarding medication safety metrics that are perceived to have the most value by institutions. Many terms (eg, adverse event, medication error) were not defined in the survey instrument. We did not ask respondents to list every medication safety metric used at their institution in an attempt to increase participation; however, our participation rate still represented only 20% of UHC institutions. When we isolated results that were considered to be true metrics, we found that a very low portion of respondents reported finding value in those items; it is possible that many of the organizations are using these metrics but did not report that information. Finally, the values expressed in survey results are limited to those of the individual completing the survey instrument and may not reflect the entire organization.

Conclusion

Of the UHC institutions responding to our survey, 77% reported their organization has defined metrics to measure medication safety; an additional 21% of the institutions were still in the process of defining metrics. Of metrics that were reported, 33% were true medication safety metrics.

Based on our results, as well as recommendations from AHRQ and NCC MERP, we recommend that institutions consider the following actions:

- Define true medication safety metrics to track medication safety at a local level.
- Build metrics that reflect information from at least the following domains: preventable adverse drug events, medication errors, and technology.
- Metrics should be reported for the purpose of designing specific interventions to improve the local medication use process.
- Report results to a variety of venues, including medical staff committees (eg, Pharmacy and Therapeutics Committee), interdisciplinary committees (eg, Medication Safety Committee, Patient Safety Committee), hospital administration, and pharmacy personnel.

- Design strategic operational interventions to improve safety based upon results.

Acknowledgment

The information contained in this article is based in part on data maintained by UHC. © 2012 UHC. All rights reserved.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Ross W. Thompson has served on advisory boards for McKesson Corporation and AMAG Pharmaceuticals.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

1. Committee on Identifying and Preventing Medication Errors. *Preventing Medication Errors: Quality Chasm Series*. Washington, DC: National Academies Press; 2006.
2. Leape LL, Bates DW, Cullen DC, et al. Systems analysis of adverse drug events. *JAMA*. 1995;274(1):35-43.
3. Kohn LT, Corrigan JM, Donaldson MS, eds. *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press; 1999:1-8.
4. Krahenbuhl-Melcher A, Schlienger R, Lampert M, et al. Drug-related problems in hospitals: a review of the recent literature. *Drug Saf*. 2007;30(5):397-407.
5. Bates DW, Boyle DL, Vander Vliet MB, et al. Relationship between medication errors and adverse drug events. *J Gen Intern Med*. 1995;10(4):199-205.
6. Scanlon MC, Karsh B-T, Saran KA. *Risk-Based Patient Safety Metrics*. Rockville, MD: Agency for Healthcare Research and Quality. http://www.ahrq.gov/downloads/pub/advances2/vol1/Advances-Scanlon_62.pdf. Accessed October 31, 2012.
7. National Coordinating Council for Medication Error Reporting and Prevention. Statement from NCC MERP: Use of medication error rates to compare health care organizations is of no value. http://www.nccmerp.org/council/council2002-06-11.html. Accessed June 14, 2012.
8. Rough SS, McDaniel M, Rinehart JR. Effective use of workload and productivity monitoring tools in health-system pharmacy, part 1. *Am J Health Syst Pharm*. 2010;67(4):300-311.
9. Rough SS, McDaniel M, Rinehart JR. effective use of workload and productivity monitoring tools in health-system pharmacy, part 2. *Am J Health Syst Pharm*. 2010;67(5):380-388.
10. Nowak MA, Nelson RE, Breidenbach JL, et al. Clinical and economic outcomes of a prospective antimicrobial stewardship program. *Am J Health Syst Pharm*. 2012;69(17):1500-1508.
11. Pawloski P, Cusick D, Amborn L. Development of clinical pharmacy productivity metrics. *Am J Health Syst Pharm*. 2012;69(1):45-54.

ATTACHMENT 6

Quality, Patient Care and Patient Experience Committee Charter

Purpose

The purpose of the Quality, Patient Care and Patient Experience ("Quality Committee") committee is to advise and assist the El Camino Hospital Board of directors in constantly enhancing and enabling a culture of quality and safety at ECH. The committee will work to ensure that the staff, medical staff and management team are aligned in operationalizing the tenets described in the El Camino strategic plan related to delivering high quality healthcare to the patients that we serve. High quality care is defined as care that is:

- Culture of safety that mitigates risk and utilizes best practice risk prevention strategies
- Patient-centered
- Delivered in an efficient and effective manner
- Timely
- Delivered in an equitable, unbiased manner

The organization will measure the degree to which we have achieved high quality healthcare using the CMS value based purchasing program among other measures.

Authority

All governing authority for ECH resides with the Hospital Board except that which may be lawfully delegated to a specific Board committee. The Committee will report to the full Board at the next scheduled meeting any action or recommendation taken within the Committee's authority. In addition, the Committee has the authority to select, recommend engagement, and supervise any consultant hired by the Board to advise the Board or Committee on issues related to clinical quality, safety, patient care and experience, risk prevention/risk management and quality improvement.

Voting members of the Committee shall include the directors assigned to the Committee and external (non-director) members appointed to the Committee.

The Committee, by resolution, may adopt a temporary advisory committee (ad hoc) of less than a quorum of the members of the Committee. The resolution shall state the total number of members, the number of board members to be appointed, and the specific task or assignment to be considered by the advisory committee.

Membership

- The Quality Committee shall be comprised of two (2) or more Hospital Board members. The Chair of the Committee shall be appointed by the Board Chair, subject to approval by the Board. All members of the Committee shall be eligible to serve as Chair of the Committee.
- The Quality Committee may also include (A) no more than nine (9) external (non-director) members who possess knowledge and expertise in assessing quality indicators, quality processes (e.g., LEAN), patient safety, care integration, payor industry issues, customer service issues, population health management, alignment of goals and incentives, or medical staff matters, and members who have previously held executive positions in other hospital institutions (e.g., CNO, CMO, HR); and (B) no more than two (2) patient advocate members who have had significant exposure to ECH as a patient and/or family member of a patient. Approval of the full Board is required if more than nine external members are recommended to serve on this committee.
- All Committee members shall be appointed by the Board Chair, subject to approval by the Board, for a term of one year expiring on June 30th each year, renewable annually.
- It shall be within the discretion of the Chair of the Committee to appoint a Vice-Chair from among the members of the Committee. If the Chair of the Committee is not a Hospital Board member, the Vice-Chair of the Committee shall be a Hospital Board member.

Staff Support and Participation

The CMO shall serve as the primary staff support to the Committee and is responsible for drafting the committee meeting agenda for the Committee Chair's consideration. Additional clinical representatives as well as senior members of the ECH staff may participate in the Committee meetings upon the recommendation of the CMO and subsequent approval from both the CEO and Committee Chair. These may include the Chiefs/Vice Chiefs of the Medical Staff.

General Responsibilities

The Committee's primary role is to develop a deep understanding of the organizational strategic plan, the quality plan and associated risk management/prevention and performance improvement strategies and to advise the management team and the Board on these matters. With input from the Committee and other key stakeholders, the management team shall develop dashboard metrics that will be used to measure and track quality of care and outcomes, and patient satisfaction for the Committee's review and subsequent approval by the Board. It is the management team's responsibility to develop and provide the Committee with reports, plans, assessments, and other pertinent materials to inform, educate, and update the Committee, thereby allowing Committee members to engage in meaningful, data-driven discussions. Upon careful review and discussion and

with input from management, the Committee shall then make recommendations to the Board. The Committee is responsible for:

- Ensuring that performance metrics meet the Board's expectations
- Align those metrics and associated process improvements to the strategic plan and organizational goals and quality plan
- Ensuring that communication to the board and external constituents is well executed.

Specific Duties

The specific duties of the Quality Committee include the following:

- Oversee management's development of a multi-year strategic quality plan (PaCT) to benchmark progress using a dashboard
- Oversee management's development of Hospital's goals encompassing the measurement and improvement of safety, risk, efficiency, patient-centeredness, patient satisfaction, and the scope of continuum of care services
- Review reports related to ECH-wide quality and patient safety initiatives in order to monitor and oversee the quality of patient care and service provided. Reports will be provided in the following areas:
    a. ECH-wide performance regarding the quality care initiatives and goals highlighted in the strategic plan
    b. ECH-wide patient safety goals and hospital performance relative to patient safety targets
    c. ECH-wide patient safety surveys (including the culture of safety survey), sentinel event and red alert reports and risk management reports
    d. ECH-wide LEAN management activities and cultural transformation work
    e. ECH-wide patient satisfaction and patient experience surveys
- Ensure the organization demonstrates proficiency through full compliance with regulatory requirements, to include, but not be limited to, The Joint Commission (TJC), Department of Health and Human Services, and Office of Civil Rights
- In cooperation with the Compliance Committee, review results of regulatory and accrediting body reviews and monitor compliance and any relevant corrective actions with accreditation and licensing requirements
- Review sentinel events and red alerts as per the hospital and board policy
- Oversee organizational performance improvement for both hospital and medical staff activities and ensure that tactics and plans, including large-scale IT projects that target clinical needs, are appropriate and move the organization forward with respect to objectives described in the strategic plan
- Ensure that ECH scope of service and community activities and resources are responsive to community need.

Committee Effectiveness

The Committee is responsible for establishing its annual goals, objectives and work plan in alignment with the Board and Hospital's strategic goals. The Committee shall be focused on continuous improvement with regard to its processes, procedures, materials, and meetings, and other functions to enhance its contribution to the full Board. Committee members shall be responsible for keeping themselves up to date with respect to drivers of change in healthcare and their impact on quality activities and plans. Annually, the committee should do a self-evaluation to determine the degree to which we have achieved our specific objectives related to quality of care.

Meetings and Minutes

The Committee shall meet at least once per quarter. The Committee Chair shall determine the frequency of meetings based on the Committee's annual goals and work plan. Minutes shall be kept by the assigned staff and shall be delivered to all members of the Committee when the agenda for the subsequent meeting is delivered. The approved minutes shall be forwarded to the Board for review and approval.

Meetings and actions of all committees of the Board shall be governed by, and held and taken in accordance with, the provisions of Article VI of the Bylaws, concerning meetings and actions of directors. Special meetings of committees may also be called by resolution of the Board and the Committee Chair. Notice of special meetings of committees shall also be given to any and all alternate members, who shall have the right to attend all meetings of the Committee. Notice of any special meetings of the Committee requires a 24 hour notice.

Approved as Revised: 11/12/14; 4/8/15

ATTACHMENT 7

Quality, Patient Care and Patient Experience Committee
Goals for FY 2017 - PROPOSED

Purpose

The purpose of the Quality, Patient Care and Patient Experience Committee ("Quality Committee") is to advise and assist the El Camino Hospital (ECH) Hospital Board of Directors ("Board") in constantly enhancing and enabling a culture of quality and safety at ECH, to ensure delivery of effective, evidence-based care for all patients, and to oversee quality outcomes of all services of ECH. The Quality Committee helps to assure that exceptional patient care and patient experience are attained through monitoring organizational quality and safety measures, leadership development in quality and safety methods and assuring appropriate resource allocation to achieve this purpose.

Staff: Eric Pifer, MD, CMO

The CMO shall serve as the primary staff support to the Committee and is responsible for drafting the committee meeting agenda for the Committee Chair's consideration. Additional clinical representatives may participate in the Committee meetings upon the recommendation of the CMO and subsequent approval from both the CEO and Committee Chair. These may include the Chiefs/Vice Chiefs of the Medical Staff, VP of Patient Care Services, physicians, nurses, and members from the Community Advisory Councils or the community-at-large. The CEO is an ex-officio of this Committee.

Goals	Timeline by Fiscal Year (Timeframe applies to when the Board approves the recommended action from the Committee, if applicable.)	Metrics
1. Review the hospital's organizational goals and scorecard and ensure that those metrics and goals are consistent with the strategic plan and set at an appropriate level as they apply to the Quality, Patient Care, and Patient Experience Committee.	▪ Q1 – Goals ▪ Q3 - Metrics	▪ Review, complete, and provide feedback given to management, the governance committee, and the board.
2. Biannually review peer review process and medical staff credentialing process.	▪ Every other year	
3. Develop a plan to review exceptions for goals that are being monitored by the management team and report those exceptions to the El Camino board of directors.	▪ Q3	

Goals	Timeline by Fiscal Year (Timeframe applies to when the Board approves the recommended action from the Committee, if applicable.)	Metrics
4. Review and oversee a plan to ensure the safety of the medication delivery process. The plan should include a global assessment of adverse events and it should include optimizations to the medication safety process using the new iCare tool.	▪ Q2	Review the plan and approve.
5. Further investigate Patient and Family Centered Care and develop an implementation plan.	▪ Q2	Review the plan and approve.

Submitted by:
Dave Reeder, Chair, Quality Committee
Daniel Shin, MD, Executive Sponsor, Quality Committee

ATTACHMENT 8

El Camino Hospital
THE HOSPITAL OF SILICON VALLEY

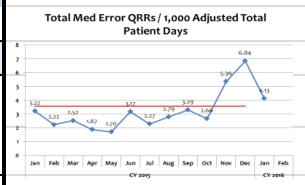
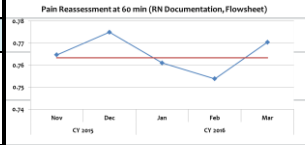
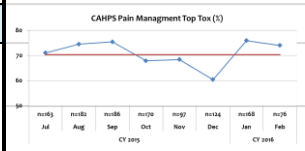
Performance Measurement

Organizational Goals FY17: Draft	Benchmark	2016 ECH Baseline	Minimum	Target	Maximum	Weight	Evaluation Timeframe
Threshold Goals							
Joint Commission Accreditation	Standard Threshhold	Full Accreditation	Full Accreditation			Threshold	FY 17
Budgeted Operating Margin	90% threshold recommended by Exec Comp Consultant (FY16)	TBD	90% of Budgeted			Threshold	FY 17
Patient Safety & iCare							
Exploring one goal from the following: Pain Management, Med Rec at Admission, Medication Safety (Quality Committee will finalize in April)						34%	FY17
Achieve Medicare Length of Stay Reduction while Maintaining Current Readmission Rates for Same Population	Internal Improvement	TBD	.05 Day Reduction from FY16 Target, Readmission at or below FY16 Target	.10 Day Reduction from FY16 Target, Readmission at or below FY16 Target	.20 Day Reduction from FY16 Target, Readmission at or below FY16 Target	33%	FY17
Smart Growth							
Targeted Growth, &/or Geographic Expansion (3/14-15 Strategic Retreat to address potential goals)						33%	FY 17
					TOTAL:	100%	

El Camino Hospital
THE HOSPITAL OF SILICON VALLEY

DRAFT – For Board Quality Discussion

Note the baselines may change, and or the targets

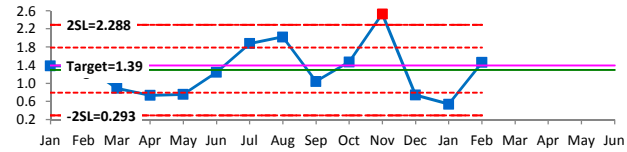
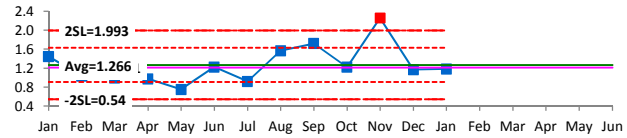
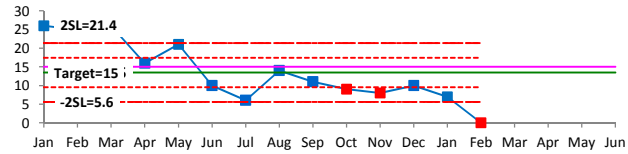
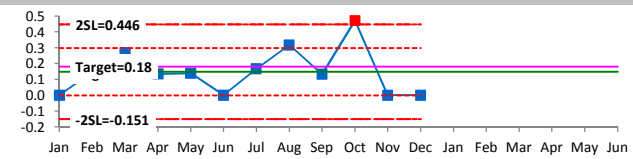
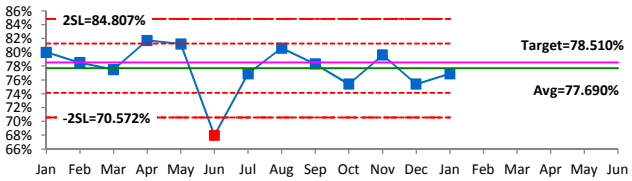
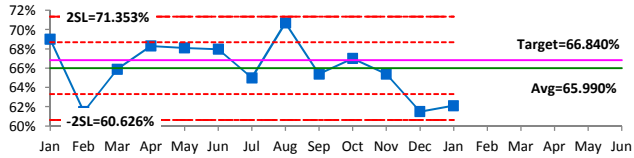
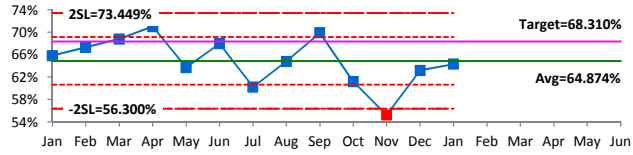
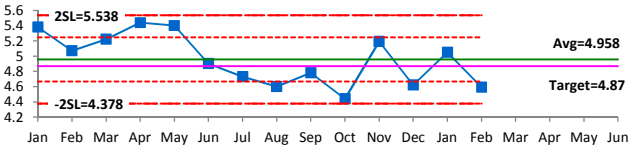
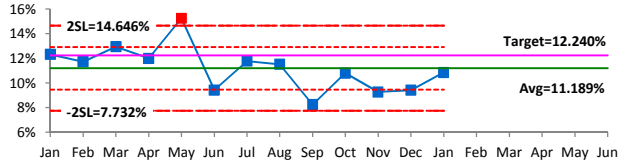
Organizational Goals FY17: Draft	Benchmark	2016 ECH Baseline	Minimum	Target	Maximum	Weight	Evaluation Timeframe	Baseline Trend
Patient Safety and iCare Goal Options								
Option 1: Medication Safety Indicator		*CY 2016*						
Med Errors (Total Medication Error QRRs / 1,000 Adjusted Total Patient Days)	Internal Improvement	3.56	3.49 2% decrease	3.42 4% decrease	3.35 6% decrease	34%	FY 17	
Option 2: Pain Management Indicator		*Post Go-Live*						
Pain Reassessment (% Pain Reassessment Documented within 60 min on RN Flowsheet)	Internal Improvement	76.3%	80.2% 5% increase	82.4% 8% increase	84.0% 10% increase	34%	FY 17	
		FY 2016 Q1-2						
Patient Satisfaction Pain Management Score (% Scored Top Box for CMS CAHPS - Pain Management)	Internal Improvement	70.3%	71.7% 2% increase	74.5% 6% increase	75.9% 8% increase	34%	Jul 2016 - May 2017	

ATTACHMENT 9

El Camino Hospital
THE HOSPITAL OF SILICON VALLEY

Quality and Safety Dashboard (Monthly)

Date Reports Run: 3/17/2016

		Performance		Baseline	FY16 Goal	Trend
SAFETY EVENTS				FY2015	FY2016	
1	**Patient Falls** *Med / Surg / CC Falls / 1,000 CALNOC Pt Days* *Date Period: February 2016*	8/5475	1.46	1.39	1.39	
2	**Medication Errors** *Errors / 1000 Adj Total Patient Days* *Date Period: January 2016*	17/14386	1.18	1.21	1.21	
3	**Specimen Labeling Errors** *# Specimen Labeling Errors / Month* *Date Period: February 2016*	0	0	23	15	
COMPLICATIONS		**Performance**		**FY2015**	**FY2016**	
4	**Surgical Site Infection (SSI)** *SSI per 100 Surgical Procedures* *Date Period: December 2015*	0/623	0.00	0.19	0.18	
SERVICE		**Performance**		**FY2015**	**FY2016**	
5	**Communication with Nurses** *(HCAHPS Score)* *Date Period: January 2016 (still open until end March)*	164/213	76.9%	78.5%	78.5%	
6	**Responsiveness of Hospital Staff** *(HCAHPS Score)* *Date Period: January 2016 (still open until end March)*	120/194	62.1%	66.8%	66.8%	
7	**Communication About Medicines** *(HCAHPS Score)* *Date Period: January 2016 (still open until end March)*	93/144	64.3%	68.3%	68.3%	
EFFICIENCY		**Performance**		**Jan-Jun 2015**	**Jan-Jun 2016**	
8	★Organizational Goal **Average Length of Stay (days)** *(Medicare definition, MS-CC, ≥ 65, inpatient)* *Date Period: February 2016*	**FYTD 3326** **01-06/16 1009**	**FYTD 4.78** **01-06/16 4.9**	5.17	5.07 (Min) 4.97 (Target) 4.87 (Max)	
9	★Organizational Goal **30-Day Readmission (Rate, LOS-Focused)** *(ALOS-Linked, All-Cause, Unplanned)* *Date Period: January 2016*	**FYTD 2719** **01-06/16 46/424**	**FYTD 10.22%** **01-06/16 10.85%**	12.24%	At or below 12.24	

Definitions and Additional Information

Measure Name	Definition Owner	Work Group	FY 2015 Definition	FY 2016 Definition	Source
Patient Falls	Joy Pao; Cheryl Reinking	Falls Committee	All Med/Surg/CC falls reported to CALNOC per 1,000 CALNOC (Med/Surg/CC) patient days CALNOC Fall Definition: The rate per 1,000 patient days at which patients experience an unplanned descent to the floor (or extension of the floor, e.g., trash can or other equipment, including bedside mat). All falls are reported and described by level of injury or no injury, and circumstances (observed, assisted, restrained at the time of the fall). Include Assisted Falls (when staff attempts to minimize the impact of the fall, it is still a fall). *Excludes Intentional Falls: When a patient (age 5 or older) falls on purpose or falsely claims to have fallen, it is considered an Intentional Fall and is NOT included. It is NOT considered a fall according to the CALNOC definition.*		**QRR Reporting and Staff Validation**
Medication Errors	Cheryl Reinking; Poopak Barirani Joy Pao; Chris Tarver	Medication Safety Committee; P&T Committee	5 Rights MEdication Errors: [# of Med Errors (includes: Duplicate Dose, Omitted Dose, Incorrect Patient, Incorrect Medication, and Incorrect Route.) divided by Adjusted Total Patient Days (includes L&D & Nursery)]* 1,000 *Excludes: Wrong Time, ADR, Contrast Reaction, Incorrect Dose, "Not Yet Rated" Med errors, No risk identified and near miss*		**QRR Reporting and Staff Validation**
Mislabeled Specimens	Edwina Sequeira; Cheryl Reinking	QIPSC	Number of blood and nonblood Laboratory specimens collected by non-Lab staff that are unlabeled or contain incomplete or incorrect information for patient ID, specimen source/site, date/time, collector initials. Soft ID GoLive in May 2015 for select units, MCH full GoLive date after iCare implementation in Nov 2015.		**Staff Manual Tracking (Thara Trieu, Laboratory)**
Surgical Site Infection	Catherine Nalesnik; Joy Pao; Carol Kemper, MD	Infection Control Committee	(Number of Deep Organ Space infections divided by the # of all sugery cases)*100 counted by the month procedure under which infection was attributed to and not by the month it was discovered. All Surgery Cases in the 29 Surgical Procedural Categories required by the California Department of Public Health.		**IC Surveillance and NHSN Data Reporting**
Communication with Nurses	RJ Salus; Meena Ramchandani; Cheryl Reinking	Patient Experience Committee	Percent of inpatients responding "Always" to the following 3 questions [% Top Box]: 1. *During hospital stay, how often did the nurses treat you with courtesy and respect?* 2. *During hospital stay, how often did nurses listen carefully to you?* 3. *During hospital stay, how often did nurses explain things in a way you can understand?* CMS Qualified values are pulled from the Avatar website.Note: A complete month's data is available on the first Monday following 45 days after the end of the month.		**Press Ganey Tool**
Responsiveness of Hospital Staff	Dan Shin, MD; Dave Francisco, MD; RJ Salus	Patient Experience Committee	Percent of inpatients responding "Always" to the following 2 questions [% Top Box]: 1. *During hospital stay, after you pressed the call button, how often did you get help as soon as you wanted it?* 2. *How often did you get help in getting to the bathroom or in using a bedpan as soon as you wanted (for patients who needed a bedpan)?* CMS Qualified values are pulled from the Avatar website.Note: A complete month's data is available on the first Monday following 45 days after the end of the month.		**Press Ganey Tool**
Communication About Medicines	RJ Salus; Cheryl Reinking; Bob Blair	Patient Experience Committee	Percent of inpatients (who received meds) responding "Always" to the following 2 questions [% Top Box]: 1. Before giving you any new medicine, how often did hospital staff tell you what the medicine was for? 2. Before giving you any new medicine, how often did hospital staff describe possible side effects in a way you could understand? CMS Qualified values are pulled from the Avatar website. Note: A complete month's data is available on the first Monday following 45 days after the end of the month.		**Press Ganey Tool**
Average Length of Stay	Michelle Pezzani, MD; Sanjay Agarwal, MD; Mick Zdeblick; Cheryl Reinking; Petrina Griesbach	LOS Steering Committee	Average LOS of Medicare FFS, Paitents discharged from an Acute Care or Intensive Care unit. Excludes expired patients. Includes final coded patients aged 65 an older at the time of the encounter. The baseline period is from Jan-June 2015 and the performance period is from Jan-June 2016.		**EDW Data Pull, Department of Clinical Effectiveness**
30-Day Readmission (LOS-Focused)	Michelle Pezzani, MD; Margaret Wilmer; Cheryl Reinking; Petrina Griesbach	Readmission Committee	Percent of Medicare inpatient discharges return for an unplanned IP stay for any reason within 30 days, aged ≥65. Excludes patients who die, leave AMA or are transferred to another acute care facility; excludes admits to ECH Rehab and Psych admissions and for medical treatment of cancer.		**EDW Data Pull, Department of Clinical Effectiveness**

El Camino Hospital
THE HOSPITAL OF SILICON VALLEY

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SSI Follow-Up Discussion

Submitted by *Carol Kemper, MD, Medical Director, Infection Control*
Catherine Nalesnick, Manager, Infection Control; Dept of Clinical Effectiveness
Joy Pao, Sr. Director, Dept of Clinical Effectiveness

1. **ECH Infection Control Process Highlight:**
   Active Surveillance
   - Daily review of hospital census for diagnosis related to SSI
   - Daily review of all positive lab cultures relating to wound infections
   - Weekly review of all potential SSIs with IC Director
   - QRR: submitted by OR staff on readmission SSI surgeries
   - Monthly: post-discharge surveillance with monthly mailings to physician offices
   - Tracking post-operative infections for 29 different surgical procedures for NHSN (>10,000 procedures per years)
   - Data "normalized" to other hospital, adjusting for varying risk factors within each facility, with the goal of achieving a SIR < 1.0 (i.e., Standardized Infection Ratio)
   - In FY 2015, a total of 13 SSI for 6,685 procedures for Mountain View and a total of 3 SSI for 1,741 procedures at Los Gatos

2. **CDPH SSI Reporting Requirement**[1]: "SSI report deep or organ-space surgical sites, health-care-associated infections…."

   Attachment: CDPH Health and Safety Code (HSC) Section 1288.55

3. **SSI Reporting Time Frame**[2]**:** Surgical Site Infection Criteria – Surveillance Period, 30 versus 90-day Surveillance

   Attachment: CDPH Health and Safety Code (HSC) Section 1288.55

[1] *http://www.cdph.ca.gov/programs/hai/Documents/LNC-AFL-11-32.pdf*
[2] *http://www.cdc.gov/nhsn/PDFs/pscManual/9pscSSIcurrent.pdf*

State of California—Health and Human Services Agency
California Department of Public Health

HOWARD BACKER, MD, MPH
Interim Director

EDMUND G. BROWN JR.
Governor

April 27, 2011

AFL 11-32
(ATTACHMENT A REVISED)

TO: General Acute Care Hospitals

SUBJECT: Requirements for Reporting Surgical Site Infections

AUTHORITY: Health and Safety Code (HSC) Section 1288.55

The purpose of this letter is to notify California general acute care hospitals (GACHs) of new California Department of Public Health (CDPH) guidance for reporting surgical site infections (SSI) as mandated under HSC Section 1288.55.

The statute does not allow for phased-in implementation for reporting of all surgical site infections; therefore, this letter amends the guidance provided in AFL 11-23.

Commencing with surgeries performed on or after June 1, 2011, GACHs must report to CDPH through the Centers for Disease Control Prevention National Healthcare Safety Network (NHSN) all SSI in accordance with HSC section 1288.55 (a) (3):

> "Each health facility shall report quarterly to the department all health-care-associated surgical site infections of **deep or organ space surgical sites**, health-care-associated infections of orthopedic surgical sites, cardiac surgical sites, and gastrointestinal surgical sites designated as clean and clean-contaminated, and the number of surgeries involving deep or organ space, and orthopedic, cardiac, and gastrointestinal surgeries designated clean and clean-contaminated."

NHSN does not specifically categorize surgical procedures according to type of surgery identified in HSC 1288.55. Regulations to clarify the provisions of HSC 1288.55 have not yet been promulgated, and will not be in place for several years. Pending adoption of regulations for reporting of SSIs, CDPH has identified NHSN operative procedures (Attachment A) that are consistent with the requirements of the law.

Each GACH shall declare which reportable operative procedures are performed in their facilities in the *Patient Safety Monthly Reporting Plan* in NHSN. The *Patient Safety*

Monthly Reporting Plan will indicate procedures the facility will be reporting in order to fulfill the reporting requirements of HSC 1288.55. Effective June 1, 2011 and every month thereafter, facilities must update the *Patient Safety Monthly Reporting Plan.*

All facilities must follow NHSN protocols for identifying and reporting these infections, including the use of listed ICD-9 codes to identify SSI. CDPH will publicly report on its website those risk adjusted SSI rates required by HSC 1288.55.

Data must be submitted for each patient undergoing the specified surgical procedures. Information on these NHSN protocols is available at http://www.cdc.gov/nhsn/psc_pa.html, including the importation of procedure data from electronic data files. NHSN will allow importation of procedure data by generating import files from hospital information systems that follow clinical document architecture (CDA) standards as published by NHSN at http://www.cdc.gov/nhsn/CDA_eSurveillance.html, in an ASCII (American Standard Code for Information Interchange) comma delimited text, or are in a CSV (comma separated value) file format. Guidance on the necessary steps to develop CSV importation capabilities is available through the CDPH HAI Liaison Program. Contact information for Liaison Program staff is available at http://www.cdph.ca.gov/hai.

For questions, the point of contact at CDPH is the Healthcare-Associated Infections Program at infectioncontrol@cdph.ca.gov or phone (510) 412-6060.

Sincerely,

Original Signed by Pamela Dickfoss

Pamela Dickfoss
Acting Deputy Director
Center for Health Care Quality

Attachment

Table 2. Surveillance Period for Deep Incisional or Organ/Space SSI Following Selected NHSN Operative Procedure Categories. Day 1 = the date of the procedure.

30-day Surveillance			
Code	**Operative Procedure**	**Code**	**Operative Procedure**
AAA	Abdominal aortic aneurysm repair	LAM	Laminectomy
AMP	Limb amputation	LTP	Liver transplant
APPY	Appendix surgery	NECK	Neck surgery
AVSD	Shunt for dialysis	NEPH	Kidney surgery
BILI	Bile duct, liver or pancreatic surgery	OVRY	Ovarian surgery
CEA	Carotid endarterectomy	PRST	Prostate surgery
CHOL	Gallbladder surgery	REC	Rectal surgery
COLO	Colon surgery	SB	Small bowel surgery
CSEC	Cesarean section	SPLE	Spleen surgery
GAST	Gastric surgery	THOR	Thoracic surgery
HTP	Heart transplant	THYR	Thyroid and/or parathyroid surgery
HYST	Abdominal hysterectomy	VHYS	Vaginal hysterectomy
KTP	Kidney transplant	XLAP	Exploratory Laparotomy
90-day Surveillance			
Code	**Operative Procedure**		
BRST	Breast surgery		
CARD	Cardiac surgery		
CBGB	Coronary artery bypass graft with both chest and donor site incisions		
CBGC	Coronary artery bypass graft with chest incision only		
CRAN	Craniotomy		
FUSN	Spinal fusion		
FX	Open reduction of fracture		
HER	Herniorrhaphy		
HPRO	Hip prosthesis		
KPRO	Knee prosthesis		
PACE	Pacemaker surgery		
PVBY	Peripheral vascular bypass surgery		
VSHN	Ventricular shunt		

Note: Superficial incisional SSIs are only followed for a 30-day period for all procedure types.

ATTACHMENT 10

El Camino Hospital®
THE HOSPITAL OF SILICON VALLEY

Patient and Family Centered Care Update

April 2016

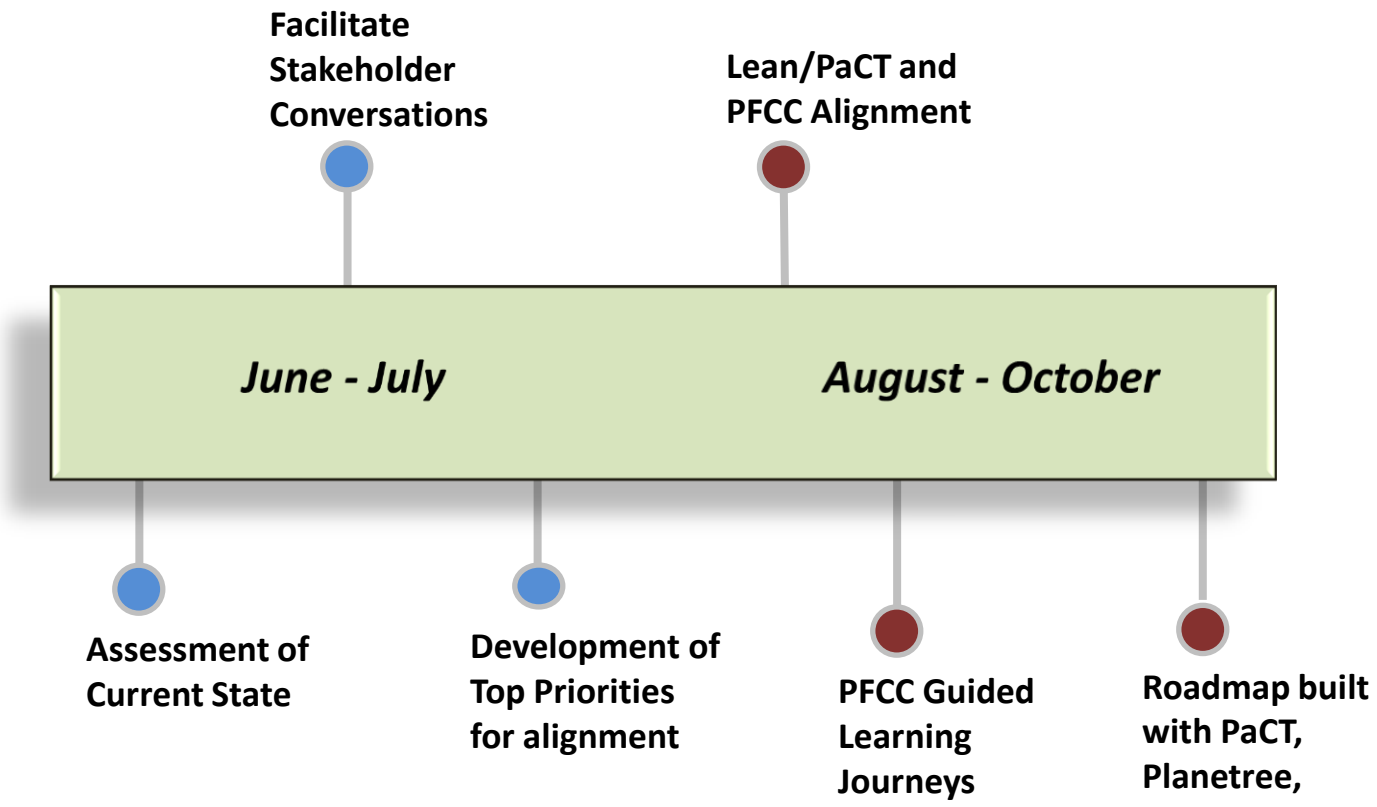
Today's Objective

- Update the Quality Committee on progress
- Confirm the actions we want to undertake in the next 6 - 9 months

Planned Actions

- Define Planetree's role in assessment
- Align current efforts to increase patient-centrism
- Incorporate PaCT (Lean Principles) with PFCC
- Develop a PFCC 12 month roadmap

Timeline


Facilitate Stakeholder Conversations
Lean/PaCT and PFCC Alignment
June - July
August - October
Assessment of Current State
Development of Top Priorities for alignment
PFCC Guided Learning Journeys
Roadmap built with PaCT, Planetree,

Alignment of Projects FY16 forward

PFCC Projects

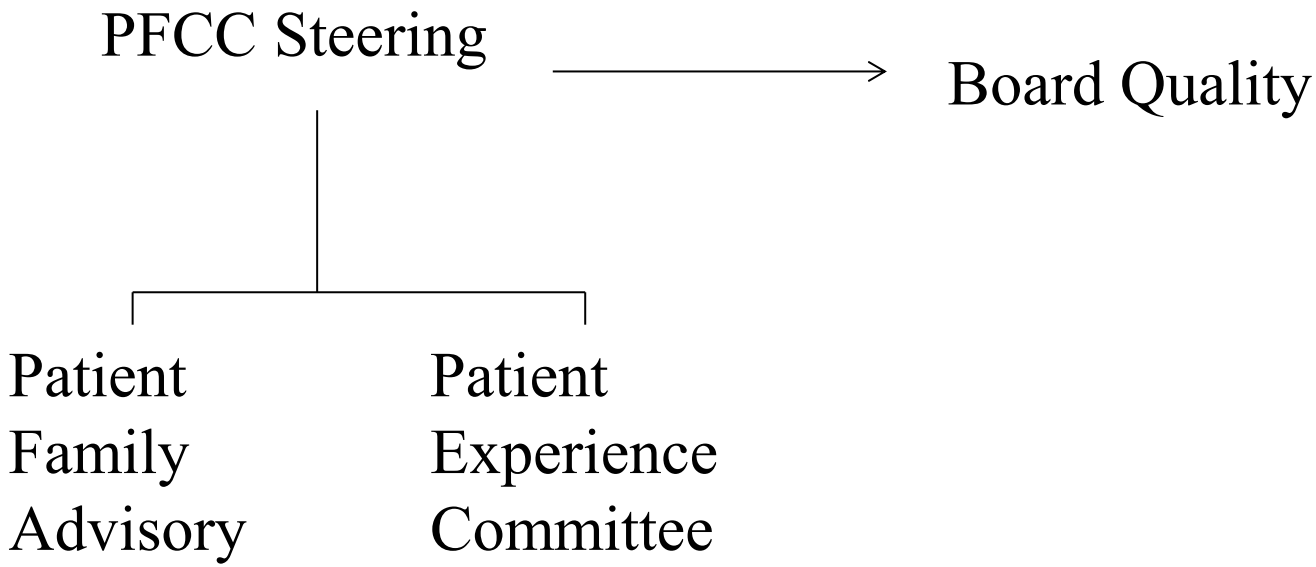
- NICU Family Centered Patient transport
- ED Experience Mapping
- Family housing
- Medication administration
- Patient transport

Indirect-PFCC work to integrate:

- Construction
- iCare
- Integrated Care
- Senior Strategy
- Discharge and LOS
- Pathways
- HR – hiring, education, and culture

Governance – Draft

Finalize through discovery process



PFCC Program Elements in place

- Healing Arts Program – Music, Art, Massage, Dog Therapy
- Leadership rounding and proactive service recovery
- Patient Family Advisory Committee
- Patient Ambassador Program (Chinese)
- Feedback systems – Surveys, Allen Tech TV, Rounding, Comment Cards, Web/Social Media, AnalyticsMD
- Responsiveness and communication tactics via purposeful hourly rounding and medication communication focus
- Care Team Coaching program
- Service Foundations Class and AIDET
- Getting to Know Me Posters
- EMMI – Pre hospitalization engagement