Using Health IT and Patient Engagement to Improve Patient Outcomes

Center for Patient Safety, Research, and Practice

Brigham and Women's Hospital

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October 2, 2017
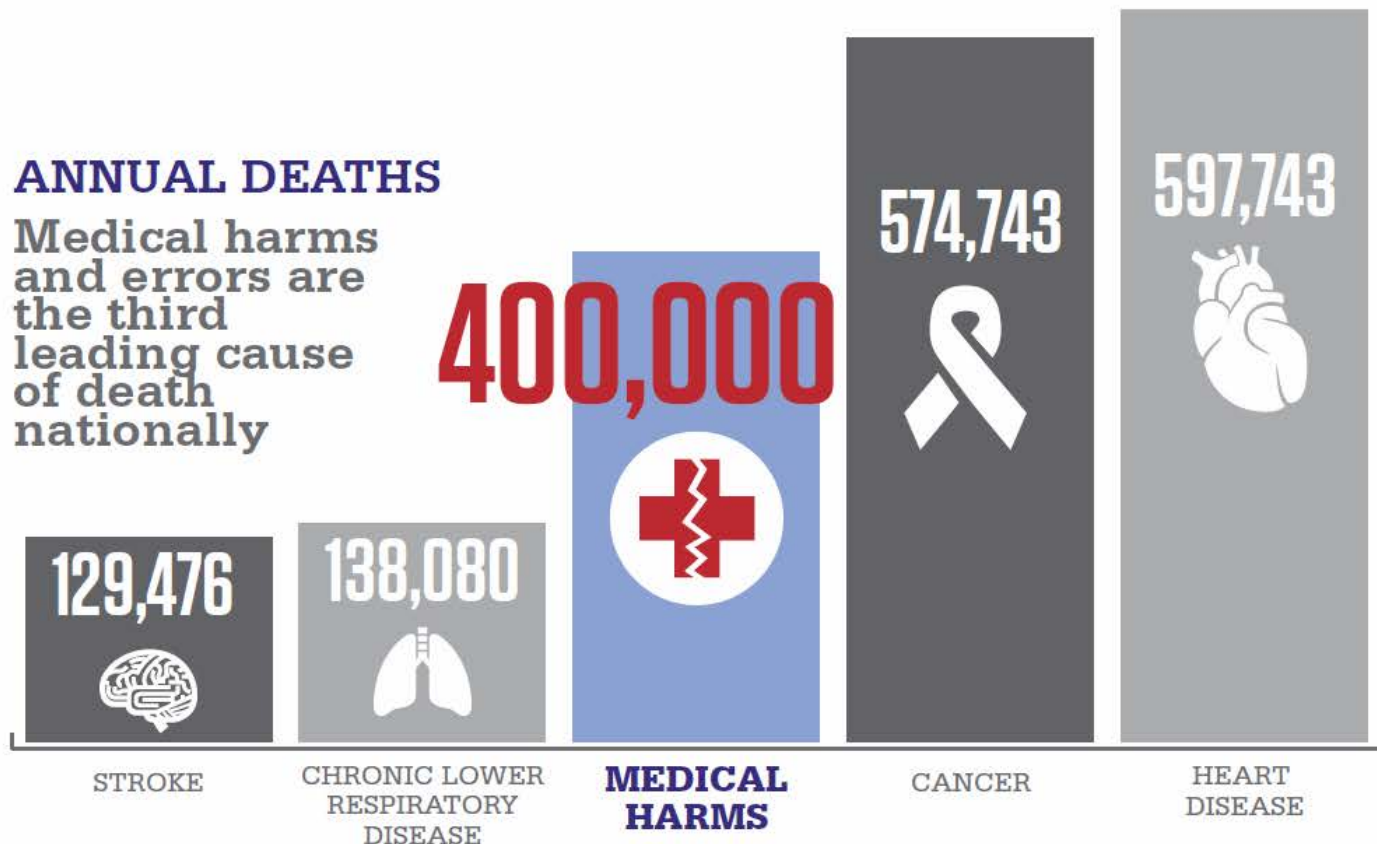
Disclosure Statement

Overview

- Background
  - Review current state of healthcare team communication
  - Define patient engagement
- Describe a series of projects that leverage health IT to improve team communication, patient engagement, and patient safety
- Review lessons learned
- Discussion

First, Do No Harm…

- Ineffective communication is a leading root cause of medical errors

ANNUAL DEATHS

Medical harms and errors are the third leading cause of death nationally

400,000

129,476 — STROKE

138,080 — CHRONIC LOWER RESPIRATORY DISEASE

MEDICAL HARMS

574,743 — CANCER

597,743 — HEART DISEASE

Van Den Bos et. al. (2011) The $17.1 Billion Problem: The Annual Cost Of Measurable Medical Errors *Health Affairs. 30 (4) 596-603* .

Team Communication Challenges

- Multiple handoffs
- Involvement of numerous professional and paraprofessional providers
- Varied communication methods
- Simultaneous parallel conversations
- Information silos
- Inconsistent beliefs re: patient/family role on care team
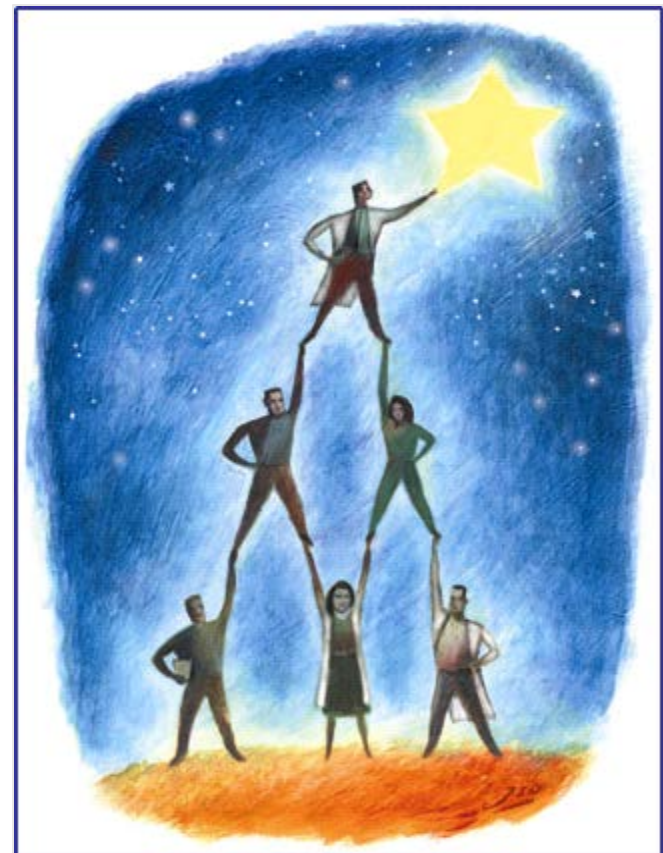
Team Communication is Suboptimal: BWH Baseline Data

- Asked ICU and Oncology patients (or caregiver), bedside RN, and physician from primary team about the patient's overall goal for hospitalization

Goals of Care among Hospitalized Patients (Haberle 2011)

1. Be Cured
2. Live Longer
3. Improve & Maintain Health
4. Be Comfortable
5. Accomplish a personal life goal
6. Provide support for family
7. Other

No. (%) of patients with X unique responses

Category	N=88	%
No. with 1 unique response	21	24%
No. with 2 unique response	44	50%
No. with 3 unique response	23	26%

Patient-centered Care

- "Providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions."

Institute of Medicine, Crossing the Quality Chasm (2001)
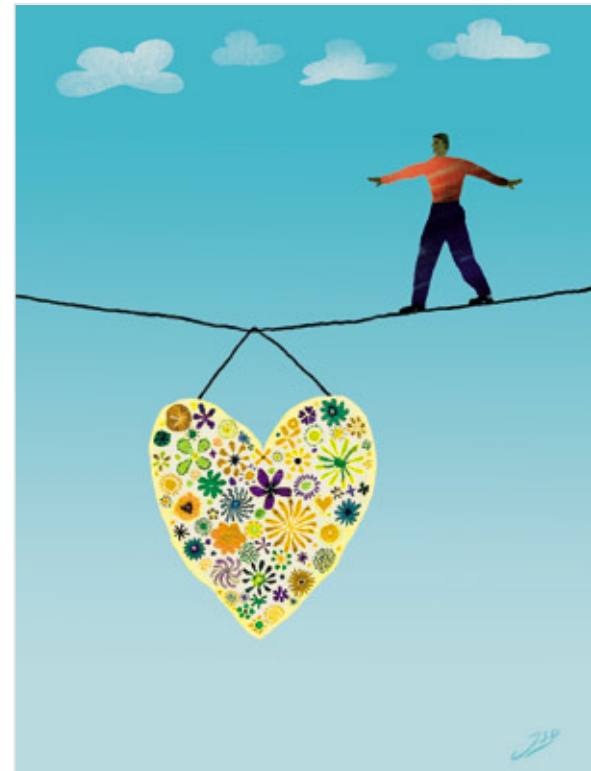
Patient Engagement

Patient Activation

+

Interventions/tools designed to promote activation and positive health behaviors

Precondition for patient-centered care

Activated, Engaged Patients are More likely to…

✓ Engage in preventive behavior (check-ups, screenings, and immunizations)

✓ Engage in healthy behavior such (healthy diet, regular exercise)

✓ Avoid health-damaging behavior (smoking and illegal drug use)

✓ Incur less costs

Hibbard & Green (2013). What The Evidence Shows About Patient Activation: Better Health Outcomes And Care Experiences; Fewer Data On Costs Health Affairs: 32 (2) 207-214

BWH PROSPECT Project
Promoting Respect and Ongoing Safety through Patient Engagement Communication and Technology

- Goal: To transform the intensive care environment through implementation of a patient-centered intervention to engage patients and care partners in the plan of care

Patient-Centered Tool Kit (PCTK) Components

"Patient-facing"

"Provider-facing"
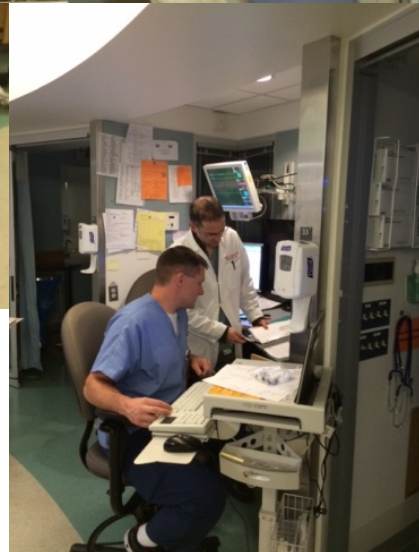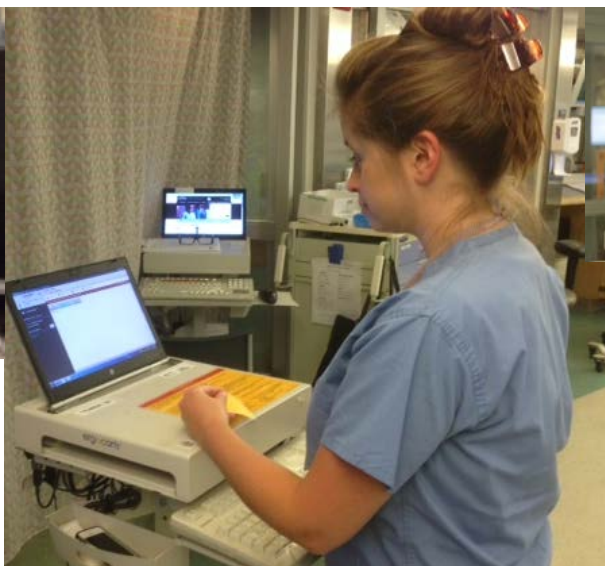
Provider FACING TOOLS

PROSPECT

Safety Checklist

Multidisciplinary Plan of Care Platform

Nursing Plan of Care

Clinical Care Classification System Problems and Outcomes

Patient Plan of Care Problems With Infobuttons

Nursing Plan of Care Documentation

Patient-Centered 'Microblog' Functionality

Patient Portal:
Patient sends a message to the care team.

Provider Portal:
Care team can view and respond using 'patient thread' and 'provider thread'
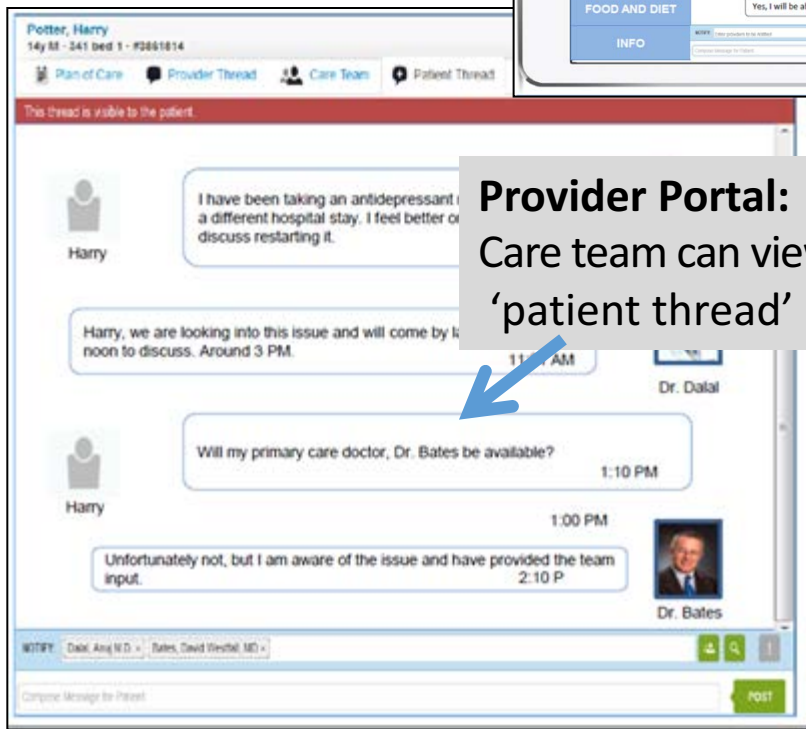
Patient FACING TOOLS

PROSPECT

My Care Team

Zoom
- **+**
BWH

Patti Prospect's Plan of Care
Room #:3B-311 Phone#:

Monday 9/15/2014
58°
Mostly Cloudy

🏠 HOME	Goals	Problems	Schedule

MY CARE TEAM

MESSAGES

SAFETY

TEST RESULTS

MEDICATIONS

FOOD AND DIET

DISCHARGE

INFO

FEEDBACK

LOG OUT

Choose your goals, preferences, and provide feedback on your care.

My Overall Goal:

Be comfortable

My Daily Goal:

Get out of bed

My Care Team is helping me to meet my goals:

Not at All	Somewhat	Completely

My Preferences related to my care:

I would like my sister to be involved in my care

Care Team Goals:

- Improve respiratory status
- Prevent skin breakdown
- Free of pain
- Adequate nutrition

Message Care Team ⌃

Zoom

BWH

Patti Prospect's Plan of Care

Room #:3B-311 Phone#:

Monday 9/15/2014
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Mostly Cloudy

HOME

MY CARE TEAM

MESSAGES

SAFETY

TEST RESULTS

MEDICATIONS

Schedule

Message Care Team

Your care team wants to hear from you. This is meant for non-urgent communications.

Write your message here

Send

eam Goals:

<4
ove skin integrity
<100.5

| Q | W | E | R | T | Y | U | I | O | P | ⌫ |

| A | S | D | F | G | H | J | K | L | return |

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| .?123 | | .?123 | ⌨ |

My Safety Concerns

My Medications

BWH

Patti Prospect's Plan of Care

Room #:3B-311 Phone#:

Monday 9/15/2014
58°
Mostly Cloudy

🏠 **HOME**

MY CARE TEAM

MESSAGES

SAFETY

TEST RESULTS

MEDICATIONS

FOOD AND DIET

DISCHARGE

INFO

FEEDBACK

LOG OUT

My Discharge Checklist:

Please only check the items that you know are complete, it will help you get home safely.
If you have questions, ask your care team or send them a message by clicking the MESSAGES tab.

My
Follow-up Care

My
Medications

My Self-Care

My Plan
of Care
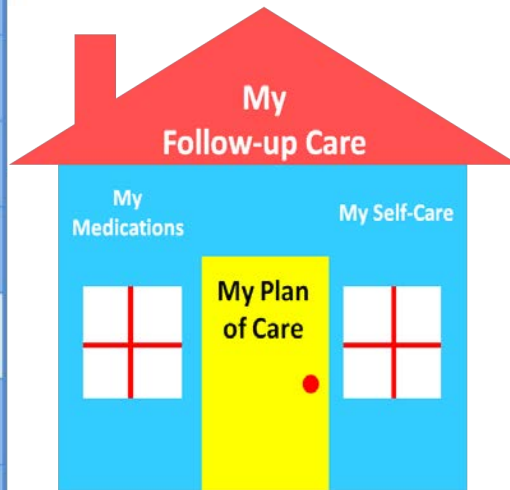
My Follow Up Care

- ☐ I understand where I am going after I leave the hospital.
- ☐ My family or someone close to me knows that I am coming home (leaving the hospital) and is prepared to provide the support I need.
- ☐ I have a follow-up appointment scheduled with my doctor.
- ☐ I will be willing and able to get to and keep that appointment.
- ☐ I have the name and phone number of a person I should contact if a problem arises after I leave the hospital.

My Medications

My Self-Care Management

My Plan of Care

Message Care Team ⌃

PROSPECT Research Question and Study Design

Does the PROSPECT framework positively impact satisfaction, care plan concordance, and lead to reduction in adverse events and healthcare resource utilization and costs?

Pre-Post Design

Data collection (control and intervention units)

PROSPECT Intervention

Pre-implementation Period

7/1/13 – 6/8/14

Post-implementation Period

7/1/14 – 5/29/15

Education & Training

Wash-in Period

6/9/14 – 6/30/14
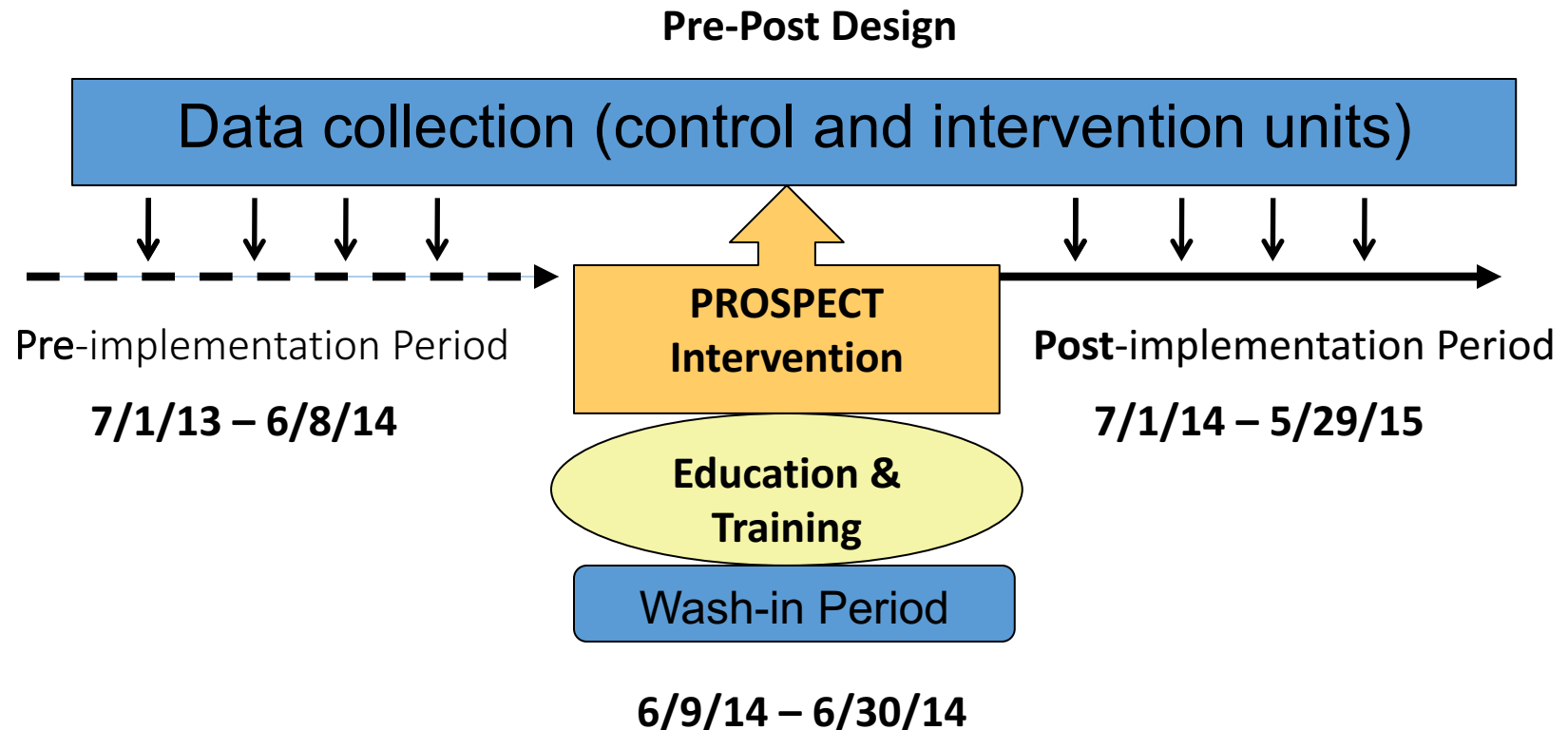
PROSPECT Patient Demographics

- Pre: 1030

- Post: 1075

- Demographics similar pre-post; Post patient less likely to be Caucasian (p=.02)

- Toolkit users: 194 (18%)
  - Mean age: 60
  - More likely to be Caucasian and private pay

Findings

	Pre-intervention	Intervention	P-value
Preventable harms/ 1000 patient days	65.2	46.6	<.001
Overall hospital rating (patient)	71.8%	93.3%	<.001
Overall satisfaction (care partners)	84.3%	90.0%	<.001
Mean global concordance overall goal of hospitalization	26.9%	34.0%	<.001
Resource utilization • Mean (Median) Length of Stay (days) • 30-day hospital readmission	4.9 (2) 19%	5.0 (2) 18.4%	0.61 0.82

Findings*

- Improved patient/care partner satisfaction

- Reduction in adverse events

- No change in care pan concordance

- No change in resource utilization

- Patient Feedback:

  - "It's a really great idea. We're always asking questions so this way we won't have to chase anyone down"

  - *(In response to "My Care Team page)* "These are my friends! I've known them for 7 years. It's nice to see their pictures here"

  - "With something like this, you know what's going on"

  - "This is great! Patients need more info about risks, safety, medications, 'who is my doctor' …"

*Dykes PC, Rozenblum R, Dalal A, Massaro A, Chang F, Clements M, Collins S, Donze J, Fagan M, Gazarian P, Hanna J, Lehmann L, Leone K, Lipsitz S, McNally K, Morrison C, Samal L, Mlaver E, Schnock K, Stade D, Williams D, Yoon C, Bates DW. Prospective Evaluation of a Multifaceted Intervention to Improve Outcomes in Intensive Care: The Promoting Respect and Ongoing Safety Through Patient Engagement Communication and Technology Study. **Critical Care Medicine** 2017 May 03. PMID: 28471886.

PROSPECT Team

BWH Research Investigators

- David Bates – *Principal Investigator*
- Sarah Collins – *Co-Investigator/Nursing Informatics Specialist*
- Anuj Dalal – *Co-Investigator*
- Patricia Dykes – *Co-Investigator/Director*
- Priscilla Gazarian – *Co-Investigator*
- John Hanna – *Research Assistant*
- Jaeho Lee – *Graphical Design*
- Lisa Lehmann – *Co-Investigator*
- Stuart Lipsitz – *Biostatistician*
- Kelly McNally – *Research Assistant*
- Eli Mlaver – *Research Assistant*
- Conny Morrison – *Research Assistant*
- Kumiko Ohashi – *Project Manager*
- Sucheta Ravindran – *Research Assistant*
- Ronen Rozenblum – *Co-Investigator*
- Lipika Samal – *Co-Investigator*
- Diana Stade – *Research Assistant*
- Cathy Yoon – *Data Analyst*
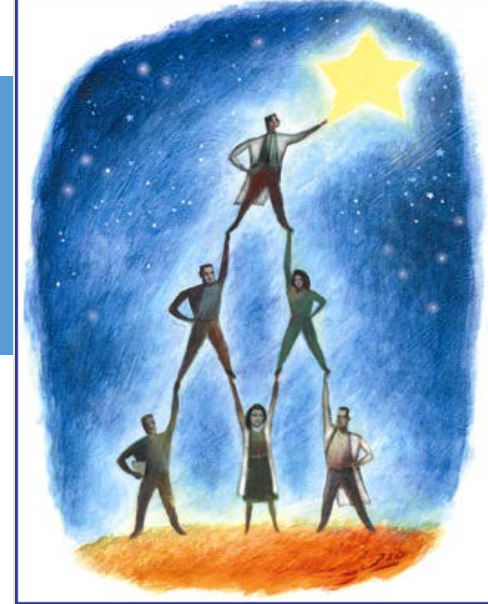
Clinical Leadership

- Oncology
  - Ted Alyea – *Medical Director*
  - Eddy Chen – *Medical Oncologist*
  - Katie Fillipon – *Nursing Director*
  - Marsha Malone – *Nursing Director*
- MICU
  - Kathleen Leone – *Nursing Director*
  - Anthony Massaro – *Medical Director*

Other Collaborators

- Frank Chang – *Developer*
- George Getty – *Developer*
- Deborah Williams – *Database Programmer*
- Maureen Fagan – *Executive Director for Patients and Families*
- Care Thread Inc.

Fall TIPS (Tailoring Interventions for Patient Safety)

Fall TIPS (Tailoring Interventions for Patient Safety)

- 2 year mixed methods study funded by Robert Wood Johnson Foundation:
  - Qualitative phase:
    - why do hospitalized patients fall?
    - what interventions are effective and feasible in hospital settings?
  - Randomized control trial: to test a fall prevention toolkit designed to address issues identified during qualitative phase.

The Fall TIPS Toolkit Requirements

The Fall TIPS Toolkit:
Fall Risk Assessment/Tailored Plan

FALL T.I.P.S.
TAILORING INTERVENTIONS FOR PATIENT SAFETY

PARTNERS HEALTHCARE

BWH BRIGHAM AND WOMEN'S HOSPITAL

Patient Name: Jane Doe **MRN:** 12345678 (BWH) **Location:** I4-10A

Morse Fall Scale: For more info, scroll over each response below

History of Falls-past 3 months:	☑ Yes (25)
Secondary Diagnosis:	☐ Yes (15)
Ambulatory Aid:	○ None / Bed Rest / Nurse Assist (0) ◉ Crutch / Cane / Walker (15) ○ Furniture (30)
IV or Hep Lock Present:	☐ Yes (20)
Gait:	○ Normal / Bed Rest / Wheel Chair (0) ◉ Weak (10) ○ Impaired (20)
Mental Status:	○ Oriented to own ability (0) ◉ Overestimates, forgets limitations (15)
Morse Fall Score:	65

For more information about Fall prevention visit our website.   For Fall TIPS Training Guide   Go To Status Dashboard
For more information about Fall TIPS project contact our team.

Interventions

Safety documentation
☑ *Safety Precautions
☑ Document previous fall
☐ Review Medication List

Consultations
☐ Consult with MD/Pharmacist
☑ PT consult

Assistance with toileting
☐ Toileting schedule using:
  ○ Bed Pan
  ○ Commode
  ○ Assist to bathroom

Print Documents
☑ Bed Poster ☑ Plan of Care

Assistance with ambulating
☑ Provide Ambulatory aid:
  ○ Crutches
  ○ Cane
  ◉ Walker ○ Other Device
☐ IV assistance when walking
☑ Out of bed with assistance:
  ◉ 1 Person
  ○ 2 Persons

Bedside assistance
☑ Bed/Chair alarm turned on
☑ Bed close to nurse station
☑ Frequent checks; re-orientation

Patient Education:
☑ English ☐ Spanish

[Print/Save] [Save]   [Clear Form] [Exit]

Fall risk assessment   **Tailored plan**

FALL T.I.P.S.

TAILORING INTERVENTIONS FOR PATIENT SAFETY

Fall Prevention Plan of Care

Problem: ***Patient is at risk for falls***

Patient Name: Jane Doe   **MRN:** 12345678   **Printed:** March 04, 2009

Patient has a history of falls	☐ Safety Precautions ☐ Document circumstances of previous falls	**History of Falls**
Patient uses ambulatory aid	☐ Place WALKER at bedside	**Ambulatory Aid: Walker**
Patient's gait is Weak	☐ Patient needs AssistX1	① **Out of Bed with Assist**
Patient overestimates ability; forgets limitations	☐ Bed/Chair alarm turned on ☐ Move pt. close to nurse station ☐ Freq Checks; re-orientation; distractions	**Bed/Chair Alarm On**

Total Morse Fall Score: 65

Sign/Credentials _Patricia C. Dykes RN_   **Date/Time** _3/04/09_

Fall T.I.P.S. Research Study Plan of Care Documentation Form October 1, 2008 - June 30, 2009
Medical Record Copy

- Findings:

  – Patient falls were significantly reduced on intervention units.

There were fewer falls in intervention units than in control units

Patients aged 65 or older benefited most from the Fall TIPS toolkit
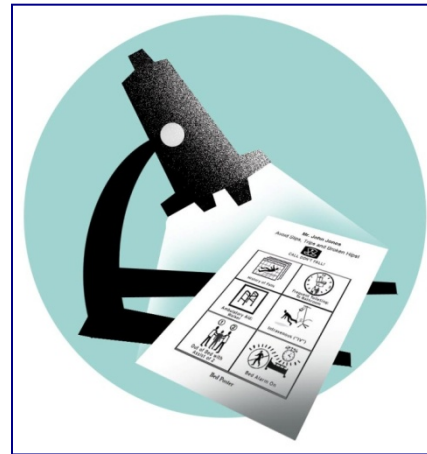
No significant effect was noted in fall related injuries

Fall Prevention Lessons Learned

Fall Prevention is a 3-Step Process*

1. Fall Risk Screening/Assessment

2. Tailored/Personalized Care Planning

3. *Consistent* Preventative Interventions
- Universal Precautions
- Tailored Interventions to address patient-specific areas of risk

3-Step Fall Prevention Process

Strategies and tools to facilitate the 3-step fall prevention process will prevent patients from falling!

Fall Prevention Lessons Learned

- Fall TIPS reduced falls by 25% but >90% of falls are preventable…what happened?
  - Why did some patients with access to the Fall TIPS Toolkit fall?
    - What factors are associated with falls in younger patients?
    - What factors are associated with falls in older patients?
  - Secondary analysis of fallers (cases) n=48 and 144 matched controls exposed to the Fall TIPS toolkit*
  - Found that in all cases, planned interventions were not followed consistently by the patient (most frequently) or the nurse
    - i.e., Out of bed with assistance

How do we get patients to CONSISTENTLY follow their fall prevention plan?

Dykes PC, I-Ching EH, Soukup JR, Chang F, Lipsitz S. A case control study to improve accuracy of an electronic fall prevention toolkit. **AMIA Annu Symp Proc**. 2012; 2012:170-9.

Rationale for Patient Engagement in 3-Step Fall Prevention Process

- Facilitates patient understanding of personal fall risk status and the plan to prevent a fall.

- Promotes patient understanding of their role in fall prevention.

- Facilitates patient (and family) partnership in ensuring that the plan is carried out consistently.

A common reason why patients fall is that planned interventions are not followed consistently by the patient (most frequently) or the team*

*Dykes PC, I-Ching EH, Soukup JR, Chang F, Lipsitz S. A case control study to improve accuracy of an electronic fall prevention toolkit. AMIA Annu Symp Proc. 2012; 2012:170-9.

BWH Patient Safety Learning Lab
Patient-Centered Fall Prevention Toolkit

Primary Aim:

- To engage patients and their family caregivers as well as providers in the design and development of a fall prevention toolkit.

Mixed Methods/Participatory Design Approach

- Surveys, observations, semi-structured interviews
  - Nurses, patients, families
- Interviews recorded, analyzed for themes
- Focus end-user requirements for patient participation in 3-step fall prevention process
- Feedback on prototype tools
  - Electronic
  - Paper

Evaluate

Problem Analysis

Implement

Design
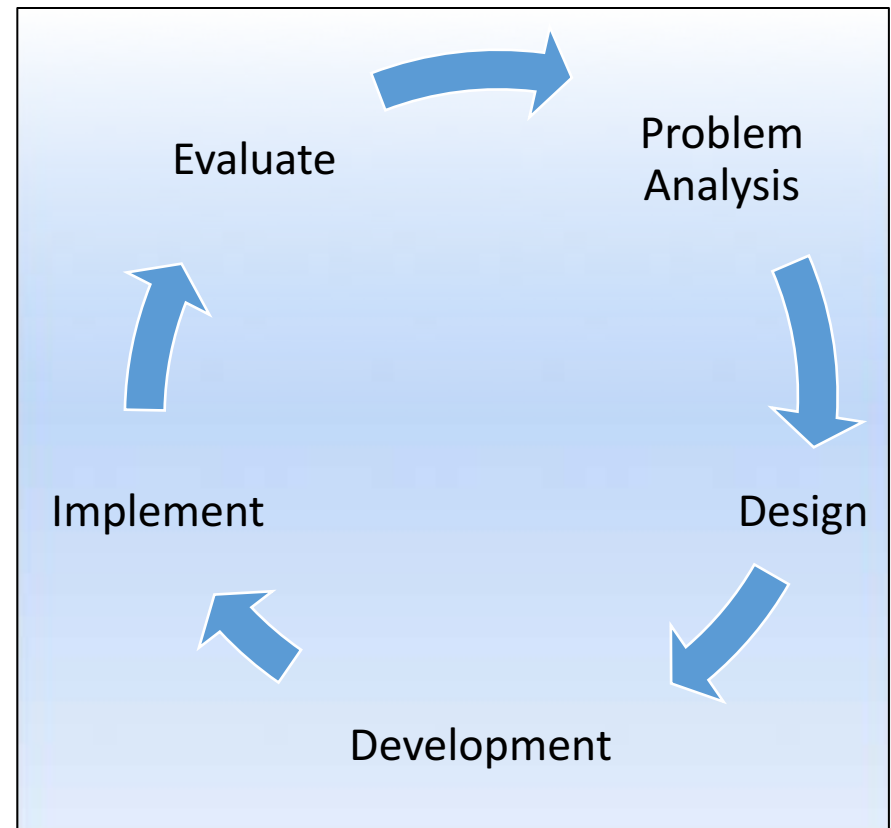
Development

Iterative Design and Development

- **Design phase**
  - Powerpoint mockups by Systems Engineering interns at Northeastern University
  - Qualitative feedback from Patient and Family Advisory Council (PFAC) and patients at bedside
- **Development phase**
  - System and integration software testing
  - Usability testing with patients and providers to refine tools
  - Iterative fall prevention icon development with ongoing patient and clinician validation (patient n=90; clinicians n=59)

Fall TIPS Electronic Tool Prototype

Fall TIPS Paper Tool Prototype

FALL RISK ASSESSMENT

EVIDENCE-BASED FALL INTERVENTIONS

Requirements for Patient Engagement

- Icons: Must be patient friendly
  - Validate with patients
- Electronic tool: Improve visual appeal of user interface, improve ease of use, eliminate double work/documentation
  - Simplify
  - Link with Morse Fall Scale/fall prevention interventions in EHR
- Paper tool: Simplify visual display, optimize for use by patient/family,
  - Add decision support to link areas of risk to interventions
  - Develop Spanish version

Requirement: Validate Icons with Patients

Fall Risks Assessment Concepts	Initial Mean CIV Score (Patient)	Initial Icon	Dislikes	Suggested Improvements	Final Icon	Final Mean CVI Score (Patient)	Final Mean CVI Score (Nurse)
History of Falls	2.8		-looks like a cage -days are too small	-use "January" instead of days as header		3.0	3.2
You have a medical condition and are taking medications that may make you dizzy, unsteady, or cause you to urinate frequently.	3.2		-black background -only a prescription -seemingly unrelated to falls	-eliminate background -perhaps draw patient as well as prescription		3.0	3.1
You need an ambulatory aid (walking aid) to walk safely.	3.7		-only includes one device	-possibly include more devices		3.4	3.6
You have an intravenous ("IV") or other equipment attached to you.	3.1		-shows the act of tripping	-standing patient with IV		3.7	3.7
Your gait is unsteady.	2.6		-looks like someone slipping on wet floor, not unsteady gait	-draw person looking unsteady -lines around arms/legs to indicate unsteadiness -feet misaligned -put stars around head -some iterations too closely resemble dancing		3.0	3.0
You may forget (or refuse) to call for help to get out of bed.	2.3		-suggests deep thoughts rather than desired concept	-draw a patient sitting on bed looking confused -use question marks -include phone or call bell -have person with string tied around finger to indicate remembering -include stop sign		3.1	2.7

Leung WY, Adelman J, Bates DW, Businger A, Dykes JS, Ergai A, Hurley A, Katsulis Z, Khorasani S, Scanlan M, Schenkel L, Rai A, **Dykes PC.** *Validating Fall Prevention Icons to Support Patient-Centered Education*. **J Patient Safety**. 2017 Feb 22. PMID: 28230576.

Fall Risks

(Check all that apply)

Fall Interventions

(Circle selection based on color)

History of Falls ☐

Walking Aid ☐

IV Pole or Equipment ☐

Medication Side Effects ☐

May Forget or Choose Not to Call ☐

Unsteady Walk ☐

Communicate Recent Falls

Use Ambulatory Aid

Crutches   Cane   Walker

IV Assistance When Walking

Toileting Schedule: Every ___ hours

Bed Pan   Commode   Bathroom

Bed Alarm On

Assistance Out of Bed

①   ① ②

None

Laminated Paper Fall T.I.P.S.

Nombre:	Fecha:
Riesgos de Caídas *(Marque todo lo que corresponda)*	**Intervenciones Para Caídas** *(Circule la sección basada en el color)*

Riesgos de Caídas *(Marque todo lo que corresponda)*

- Historia de Caídas previas ☐
- Efectos adversos a medicamentos ☐
- *Ayudante* para caminar ☐
- Equipos para intravenosas (IV) ☐
- Marcha inestable ☐
- Olvida llamar o decide no pedir ayuda ☐

Intervenciones Para Caídas *(Circule la sección basada en el color)*

Comunique caídas recientes

Ayudas para caminar — Muletas · Bastón · Caminador

Ayudante con IV/Equipos para caminar

Horario para ir al baño : Cada ____ horas — Sanitario de cama · Asistencia con la silla sanitaria · Asistencia para llegar al baño

La alerta de la cama está funcionando

Asistencia para salir de la Cama — ① Una persona · ① ② Dos personas

Fall risk assessment	Tailored plan based on patient's determinants of risk

Usability Results: Fall TIPS Paper Tool

Survey Question	Old (N=27)		New (N=27)		p-value
	Mean	Variance	Mean	Variance	
1. I think that I would like to use these tools frequently.	2.333	0.846	3.704	1.217	<.001
2. I find the tools unnecessarily complex.	3.148	1.746	1.667	1.077	<.001
3. I think the tools are easy to use.	2.692	1.502	4.222	0.949	<.001
4. I think that I would need the support of a fall prevention expert to be able to use these tools.	1.852	0.593	1.500	0.660	.112
5. I find the various functions in the tools are well-integrated.	2.593	0.866	3.852	1.131	<.001
6. I think there was too much inconsistency in available tools.	2.704	1.293	2.111	1.179	.06
7. I would imagine that most people would learn to use these tools very quickly.	2.889	1.333	4.296	1.063	<.001
8. I find the tools very cumbersome to use.	3.296	1.755	2.222	1.872	.005
9. I felt very confident using these tools.	3.222	1.103	4.259	1.046	<.001
10. I needed to learn a lot of things before I could get going with these tools.	2.423	1.134	1.852	0.823	.04
11. I am satisfied with the tools to support the fall prevention process at this hospital.	2.481	1.028	3.704	1.293	<.001

System Usability Scale, responses ranged from 1 (strongly disagree) to 5 (strongly agree).

Fall TIPS Poster Pilot Test

- January – June 2016
- Targeted units with fall/injury rates above hospital and state mean

Site/ Number of Units	Service	Number of Beds
Brigham and Women's Hospital/3	Neuroscience Intermediate Care	43
Brigham and Women's Hospital/2	Medical Intermediate Care	31
Brigham and Women's Hospital/2	Oncology	20
Montefiore Medical Center/1	Medical Intermediate Care	36

Fall TIPS Pilot Test Results

Average Fall Rate 2015 vs. 2016 with Average Fall TIPS Completion

Pre-intervention mean fall rate: 3.28

Post-intervention mean fall rate: 2.80
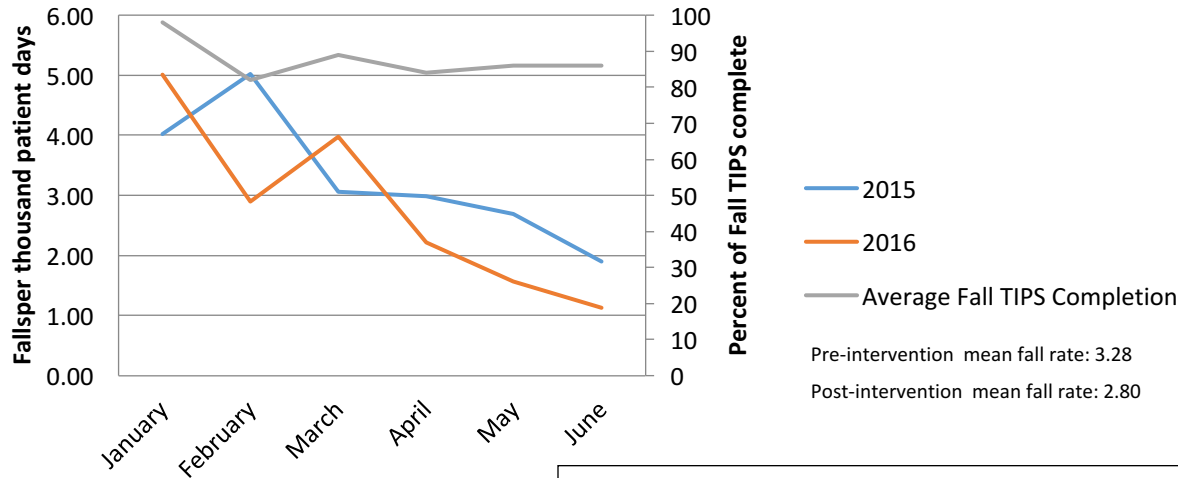
Fall TIPS Adherence: 82%

Pre-Fall TIPS Fall Rate: 3.28

Post Fall TIPS Fall Rate: 2.80

Pre-Fall TIPS Injury Rate: 1.00

Post Fall TIPS Injury Rate: .54

Average Fall Rate with Injury 2015 vs. 2016 with Average Fall TIPS Completion

Pre-intervention mean fall with injury rate: 1.00

Post-intervention mean fall with injury rate: 0.54

Dykes PC, **Duckworth M**, Cunningham S, Dubois S, Driscoll M, Feliciano Z, Ferrazzi M, Fevrin F, Lyons S, Lindros M, Monahan A, Paley M, Jean-Pierre S, Scanlan M. Pilot Testing Fall TIPS (Tailoring Interventions for Patient Safety): a Patient-Centered Fall Prevention Toolkit. **The Joint Commission Journal on Quality and Patient Safety**. Aug 2017

Patient-centered Fall Prevention Tools

- Laminated paper Fall T.I.P.S.

- Web-based and mobile patient portals to access Fall T.I.P.S.

- Patient Safety Plan Screensaver for all members of the care team, including patients and family

Patient Portal (Mobile Application view)–Fall T.I.P.S. displayed
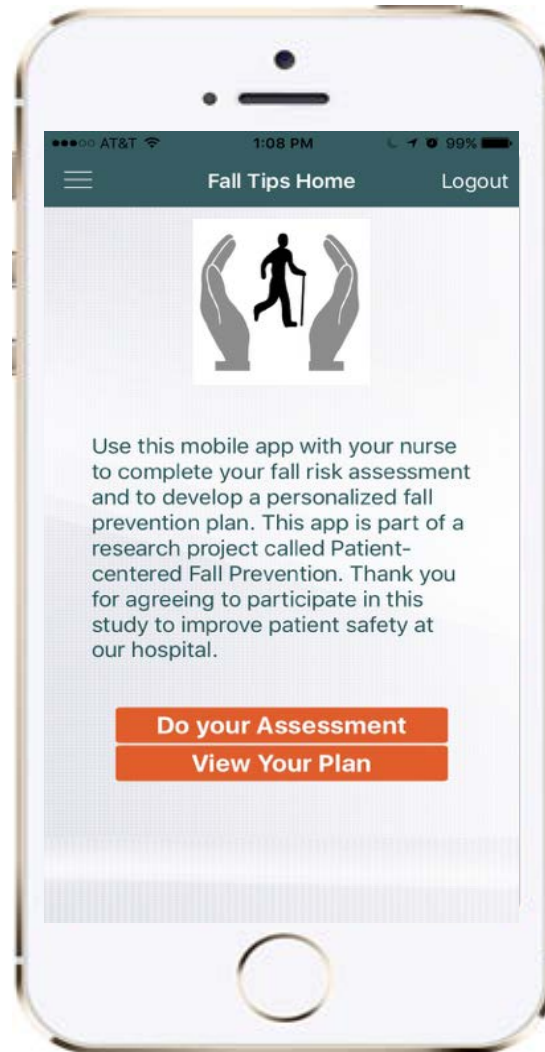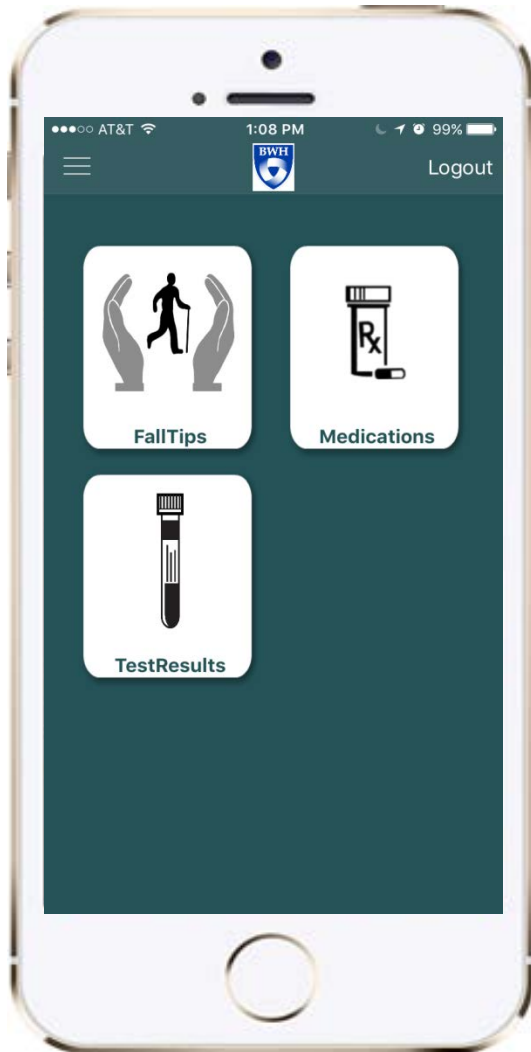
Patient Portal: Fall TIPS

Patient Room Desktop Screensaver

Patient Needs:
Hearing aid, translator, glasses/contacts, latex allergy, arm restriction

Safety Reminders:
Braden score, diet order, catheter infection, ulcer, restraints, PT exercises etc

Fall Prevention:
Toileting schedule, help to walk with IV Pole, use ambulatory aid etc

Lessons Learned

- Multidisciplinary involvement needed to improve clinical outcomes
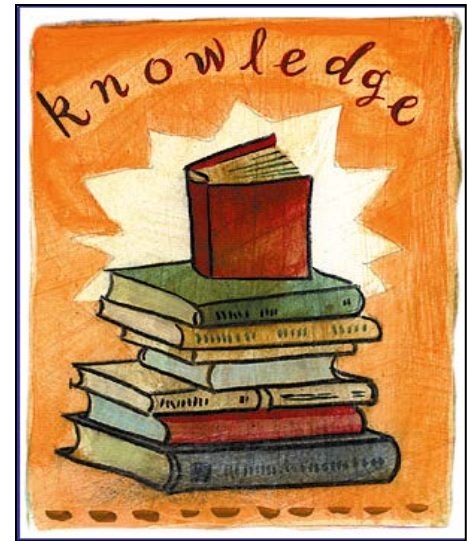 - Clinical champions to reinforce best practices
  - Documenting reasons why safety checklist items are not indicated
- Patient care units are busy; many barriers to adoption and use of new innovations
  - Patients lack capacity, no care partner
  - Lack of access outside of hospital
- A device strategy is needed
  - Accessories
  - Storage
  - Cleaning
  - Security
  - Enrollment

- Patients want to be engaged but still challenges
  - Incapacitated, less "tech-savvy", variably "activated" patients
  - Access to content for non-English speaking patients
  - Understanding of goals of care concept
  - Identifying and providing access to care partners can address some challenges
- More work needed re:
  - Workflow integration and clinician buy-in
  - Communicating value of using technology

Conclusions

- Making care better:
  - Will involve partnering with patients.
  - Will require high-tech and low-tech solutions
    - Clinician attitudes still have a ways to go
  - Will be highly multidisciplinary
    - Roles of nurses and other clinicians will change
- Health IT is opening new doors and we need to take advantage!

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Making Acute Care More Patient-centered

Patient-centered Fall Prevention

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