Using Health IT and Patient Engagement to Improve Patient Outcomes

Center for Patient Safety, Research, and Practice
Brigham and Women’s Hospital
Patricia C. Dykes PhD, RN, FAAN, FACMI

October 2, 2017
Disclosure Statement

• This project was supported by grant #P30HS023535 from the Agency for Healthcare Research and Quality (AHRQ). The content is solely the responsibility of the authors and does not necessarily represent the official views of AHRQ.
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
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.

<table>
<thead>
<tr>
<th>Goals of Care among Hospitalized Patients (Haberle 2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Be Cured</td>
</tr>
<tr>
<td>2. Live Longer</td>
</tr>
<tr>
<td>3. Improve &amp; Maintain Health</td>
</tr>
<tr>
<td>4. Be Comfortable</td>
</tr>
<tr>
<td>5. Accomplish a personal life goal</td>
</tr>
<tr>
<td>6. Provide support for family</td>
</tr>
<tr>
<td>7. Other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. (%) of patients with X unique responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
</tr>
<tr>
<td>No. with 1 unique response</td>
</tr>
<tr>
<td>No. with 2 unique response</td>
</tr>
<tr>
<td>No. with 3 unique response</td>
</tr>
</tbody>
</table>
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

### Patient: [Name]

<table>
<thead>
<tr>
<th>Item</th>
<th>Safety Screen (MD w/RN present at rounds)</th>
<th>RN Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient/Family Toolkit</strong></td>
<td>We have given the RN an opportunity to present any new patient or family input (from the Patient SatisfActive model, Toolkit, or Microblog).</td>
<td>Yes/No</td>
</tr>
<tr>
<td><strong>Vent Bundle</strong></td>
<td>Is the patient on mechanical ventilation?</td>
<td>Yes/No</td>
</tr>
<tr>
<td><strong>HOB elevation</strong></td>
<td>Indicated</td>
<td>Last documented HOB angle:</td>
</tr>
<tr>
<td><strong>Spontaneous Awakening Trial</strong></td>
<td>Indicated</td>
<td>Performed this calendar day Passed</td>
</tr>
<tr>
<td><strong>Spontaneous Breathing Trial</strong></td>
<td>Contraindicated- Hemodynamic Instability (up titration of pressors)</td>
<td>Performed this calendar day Failed</td>
</tr>
</tbody>
</table>
Multidisciplinary Plan of Care Platform
Nursing Plan of Care

<table>
<thead>
<tr>
<th>Onset Date</th>
<th>R</th>
<th>Problems</th>
<th>Goal(s)</th>
<th>Planned Assessments and Interventions</th>
<th>Outcome Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/12/2014</td>
<td>☐</td>
<td>Comfort alteration</td>
<td>Pain management goal 1</td>
<td>Assess pain every 2 hours</td>
<td>No change</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Scale used Numerical (0-10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other</td>
<td>Patient will appear comfortable</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>T &amp; R q 2 hrs w/ PROM</td>
<td>increase oob as tol</td>
<td></td>
</tr>
</tbody>
</table>

**SENSORY**

**NEURO**
Clinical Care Classification System Problems and Outcomes

Nursing Plan of Care Documentation

<table>
<thead>
<tr>
<th>Problem Category</th>
<th>Problem Description</th>
<th>Onset Date</th>
<th>Resolution</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SKIN/WOUND CARE</td>
<td>Skin integrity impairment</td>
<td>05/24/2015</td>
<td>resolve</td>
<td>Add Problem</td>
</tr>
<tr>
<td>INFECTION</td>
<td>Infection</td>
<td>05/24/2015</td>
<td>resolve</td>
<td>Add Problem</td>
</tr>
<tr>
<td>SENSORY</td>
<td>Comfort alteration</td>
<td>05/27/2015</td>
<td>resolve</td>
<td>Add Problem</td>
</tr>
</tbody>
</table>

Patient Plan of Care Problems With Infobuttons

Patient Educational Content

- Skin integrity impairment
- Infection risk

Preventing pressure ulcers

Pressure ulcers are also called bed sores or pressure sores. They can form when your skin and soft tissues press against a hard surface, such as a bed or chair, for a prolonged time. This pressure reduces blood supply to that area. Lack of blood supply can cause the skin tissue in this area to become damaged or die. If this happens, a pressure sore may form.

You have a risk of developing a pressure sore if you:
- Spent most of your day in a bed or a chair
- Are overweight or underweight
- Are not able to control your bowels or bladder
- Have decreased feeling in an area of your body
- Spent a lot of time in one position

You will need to take steps to prevent these problems.

Self-care:

You or your caregiver need to check your body every day from head to toe. Pay special attention to the areas where pressure ulcers often form. These areas are:

1. Pressure ulcers may form where:
   - Weight is often concentrated
   - Skin become thinner or more fragile
   - Skin become second thinner or more fragile
   - Skin becomes thinner or more fragile
   - Skin becomes thinner or more fragile
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

Harry Potter's Plan of Care
Room #: 1040A Phone#: (617)555-1212

My Care Team:

Attending: Dr. Dalal
PCP: Dr. Bates
Nurse: P. Dykes

Intern: Jael Lee
Primary Care Physician: David W. Bates

Attending: Amy Davis
Nurse: Patricia Dylies

Outpatient Oncologist: Lisa Lehmann
Dietitian: Kuniko Ohashi

Message Care Team
**Goals**

My Overall Goal:
Be comfortable

My Daily Goal:
Get out of bed

My Care Team is helping me to meet my goals:

<table>
<thead>
<tr>
<th>Not at All</th>
<th>Somewhat</th>
<th>Completely</th>
</tr>
</thead>
</table>

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
Be comfortable
Get out of bed
I would like my sister to be involved in my care

• Pain < 4
• Improve skin integrity
• Temp < 100.5
My Safety Concerns
My Medications:

1. HEPATITIS A VACCINE  1,440 UNITS IM x1
   Last administration given: 2013-12-04 14:15:00Z
   Next administration due:

2. ACETAZOLAMIDE PO 25 MG (5 MG/KG) Q6H
   Last administration given: 2014-06-02 10:00:00Z
   Next administration due:

3. TRANSFUSE 1 bags PLATELETS Over 0.5 hrs for platelet count < 10 thousand each bag ROUTINE 06/12
   Last administration given: 2014-06-02 10:00:00Z
   Next administration due:

4. HYDROMORPHONE HCL 1MG/ML PCA IV Q24H
   Last administration given: 2014-06-02 10:00:00Z
   Next administration due:

5. ONDANSETRON HCL 1 MG IVPUSH Q6H PRN Nausea
   Last administration given: 2014-06-02 10:00:00Z
   Next administration due:

6. NALBUPHINE HCL 5 MG IVPUSH Q4H PRN Itching
   Last administration given: 2014-06-02 10:00:00Z
   Next administration due:

7. NALOXONE HCL 0.04-0.08 MG IV Q2MINUTES PRN Other:Respiratory Depression
   Last administration given: 2014-06-02 10:00:00Z
   Next administration due:

Message Care Team
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

☐ 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 Plan of Care
- My Self-Care Management
- My Plan of Care

Message Care Team
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)

Pre-implementation Period

7/1/13 – 6/8/14

**PROSPECT Intervention**

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

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

• Improved patient/care partner satisfaction
• Reduction in adverse events
• No change in care plan 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’ …”

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.

Supported by the Robert Wood Johnson Foundation, Dykes PI
The Fall TIPS Toolkit Requirements

- Leverage Existing Workflows
- Surveillance
- Tailoring
- Teamwork
- Communication
### The Fall TIPS Toolkit: Fall Risk Assessment/Tailored Plan

**Fall T.I.P.S.**
Tailoring Interventions for Patient Safety

<table>
<thead>
<tr>
<th>Patient Name: Jane Doe</th>
<th>MRN: 12345678 (BWH)</th>
<th>Location: 14-10A</th>
</tr>
</thead>
</table>

#### Morse Fall Scale:
- **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

#### Interventions:
- **Safety Precautions**
- Document previous fall
- Review Medication List

#### Assistance with ambulating:
- **Provide Ambulatory aid:**
  - Crutches
  - Cane
  - Walker
  - Other Device
- **IV assistance when walking**
- **Out of bed with assistance:**
  - 1 Person
  - 2 Persons

#### Assistance with toileting:
- **Toileting schedule using:**
  - Bed Pan
  - Commode
  - Assist to bathroom

#### Bedside assistance:
- Bed/Chair alarm turned on
- Bed close to nurse station
- Frequent checks, re-orientation

---

**Fall risk assessment**

**Tailored plan**
# Fall Prevention Plan of Care

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

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

<table>
<thead>
<tr>
<th>Patient has a history of falls</th>
<th>Safety Precautions</th>
<th>Document circumstances of previous falls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place WALKER at bedside</td>
<td></td>
<td>History of Falls</td>
</tr>
<tr>
<td>Patient's gait is Weak</td>
<td>Patient needs AssistX1</td>
<td>Out of Bed with Assist</td>
</tr>
<tr>
<td>Patient overestimates ability, forges limitations</td>
<td>Bed/Chair alarm turned on</td>
<td>Move pt. close to nurse station</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freq Checks; re-orientation; distractions</td>
</tr>
</tbody>
</table>

**Total Morse Fall Score:** 65

**Sign/Credentials:** Patricia E. Dykes RN  
**Date/Time:** 3/04/09
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?

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*

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
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

### Patti Prospect's Plan of Care

#### Room #: NO NAME Phone #:

### Safety Reminders

<table>
<thead>
<tr>
<th>Fall Risk Factor</th>
<th>Present?</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have fallen within the last 6 months.</td>
<td></td>
</tr>
<tr>
<td>I have a medical condition and am taking medications that can make me dizzy,</td>
<td></td>
</tr>
<tr>
<td>unstable, or cause me to urinate frequently.</td>
<td></td>
</tr>
<tr>
<td>I need a walking aid to walk safety.</td>
<td></td>
</tr>
<tr>
<td>I have an intravenous (&quot;IV&quot;) or other equipment attached to me.</td>
<td></td>
</tr>
<tr>
<td>My walking is unsteady, I need assistance.</td>
<td></td>
</tr>
<tr>
<td>Sometimes I forget to call for help getting out of bed.</td>
<td></td>
</tr>
<tr>
<td>When I toilet I need:</td>
<td></td>
</tr>
</tbody>
</table>

### Fall T.I.P.S.

- **CANE**
- **CRUTCHES**
- **WALKER**
- **TOTAL ASSIST**
- **CALL FOR HELP**
- **ASSIST KIT**
- **TOILET ASSIST**
- **TOTALLY ASSIST**

### MySafeCare

- **HISTORY OF FALLS**
- **MEDICATIONS**
- **EQUIPMENT ASSIST**
- **TOTAL ASSIST**
- **ASSIST KIT**
- **CALL FOR HELP**
- **ASSIST KIT**
- **TOILET ASSIST**
- **TOTALLY ASSIST**
Fall TIPS Paper Tool Prototype

**FALL RISK ASSESSMENT**

**Why you are at risk for falling while in the hospital**

1. You have fallen recently.
2. You have a medical condition and are taking medications that may make you dizzy, unsteady, or cause you to urinate frequently.
3. You need a walking aid to walk safely.
4. You have an intravenous ("IV") or other equipment attached to you.
5. Your walk is unsteady.
6. You may forget or not want to call for help to get out of bed.

**INJURY RISK ASSESSMENT**

- Age (85 years old or older, frailty)
- Bones (osteoporosis, risk or history of fracture, etc.)
- Coagulation (risk for bleeding, low platelet counts or taking anticoagulation)
- Surgery (recent), lower limb amputation or major abdominal or thoracic surgery

**EVIDENCE-BASED FALL INTERVENTIONS**

**How can we work together to prevent you from falling while you are in the hospital?**

- **HISTORY OF FALLS**
  - Tell your nurse about recent falls.

- **BED ALARM ON**
  - The bed/chair alarm is on to remind you and your nurse that you need help to get out of bed.

- **INTRAVENOUS (IV)**
  - Ask for help to move the IV pole or other equipment.

- **Call for help to get out of bed**
  - You may need assistance to get up safely.

- **Other plans?**
  - We will stay with you while you use the toilet or commode.
  - Call for help to use the commode.
  - We would be happy to help you up to the commode.
  - Your nurse may help you move by using special equipment.
  - He or she will explain how the equipment works.

**Patient Comfort Rounds, Because we care**

We are coordinating & formalizing the excellent care we give by anticipating your needs. We are rounding every __________ to make sure:

- Your pain is controlled
- Assist you with toileting
- Make sure you are comfortable
- Your personal items are within reach
- Environment is safe

We are coordinating the care we give by anticipating your needs.
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
<table>
<thead>
<tr>
<th>Fall Risks Assessment Concepts</th>
<th>Initial Mean CIV Score (Patient)</th>
<th>Initial Icon</th>
<th>Dislikes</th>
<th>Suggested Improvements</th>
<th>Final Icon</th>
<th>Final Mean CIV Score (Patient)</th>
<th>Final Mean CIV Score (Nurse)</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of Falls</td>
<td>2.8</td>
<td><img src="image" alt="History of Falls" /></td>
<td>-looks like a cage -days are too small</td>
<td>-use “January” instead of days as header</td>
<td><img src="image" alt="Final Icon" /></td>
<td>3.0</td>
<td>3.2</td>
</tr>
<tr>
<td>You have a medical condition and are taking medications that may make you dizzy, unsteady, or cause you to urinate frequently.</td>
<td>3.2</td>
<td><img src="image" alt="Prescription" /></td>
<td>-black background -only a prescription -seemingly unrelated to falls</td>
<td>-eliminate background -perhaps draw patient as well as prescription</td>
<td><img src="image" alt="Final Icon" /></td>
<td>3.0</td>
<td>3.1</td>
</tr>
<tr>
<td>You need an ambulatory aid (walking aid) to walk safely.</td>
<td>3.7</td>
<td><img src="image" alt="Ambulatory Aid Walker" /></td>
<td>-only includes one device</td>
<td>-possibly include more devices</td>
<td><img src="image" alt="Final Icon" /></td>
<td>3.4</td>
<td>3.6</td>
</tr>
<tr>
<td>You have an intravenous (“IV”) or other equipment attached to you.</td>
<td>3.1</td>
<td><img src="image" alt="Intravenous (“IV”)" /></td>
<td>-shows the act of tripping</td>
<td>-standing patient with IV</td>
<td><img src="image" alt="Final Icon" /></td>
<td>3.7</td>
<td>3.7</td>
</tr>
<tr>
<td>Your gait is unsteady.</td>
<td>2.6</td>
<td><img src="image" alt="Caution" /></td>
<td>-looks like someone slipping on wet floor, not unsteady gait</td>
<td>-draw person looking unsteady -lines around arms/legs to indicate unsteadiness -feet misaligned -put stars around head -some iterations too closely resemble dancing</td>
<td><img src="image" alt="Final Icon" /></td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>You may forget (or refuse) to call for help to get out of bed.</td>
<td>2.3</td>
<td><img src="image" alt="Question Marks" /></td>
<td>-suggests deep thoughts rather than desired concept</td>
<td>-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</td>
<td><img src="image" alt="Final Icon" /></td>
<td>3.1</td>
<td>2.7</td>
</tr>
</tbody>
</table>

**Fall Risks**
*(Check all that apply)*

- History of Falls
- Walking Aid
- IV Pole or Equipment
- Medication Side Effects
- May Forget or Choose Not to Call
- Unsteady Walk

**Fall Interventions**
*(Circle selection based on color)*

- 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
  - None
Fall risk assessment

<table>
<thead>
<tr>
<th><strong>Nombre:</strong></th>
<th><strong>Fecha:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Riesgos de Caídas</td>
<td>Intervenciones Para Caídas</td>
</tr>
<tr>
<td>(Marque todo lo que corresponda)</td>
<td>(Circule la sección basada en el color)</td>
</tr>
</tbody>
</table>

| **Historia de Caídas previas** | **Comuníque caídas recientes** |
| Efectos adversos a medicamentos | **Ayudas para caminar** |
| **Ayudante para caminar** | Muletas | Bastón | Caminador |
| Equipos para intravenosas (IV) | **Ayudante con IV/Equipos para caminar** |
| Marcha inestable | **Horario para ir al baño : Cada ___ horas** |
| Olvida llamar o decide no pedir ayuda | Sanitario | Asistencia con de cama | Asistencia para llegar al baño |

Tailored plan based on patient’s determinants of risk
# Usability Results: Fall TIPS Paper Tool

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

*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

<table>
<thead>
<tr>
<th>Site/Number of Units</th>
<th>Service</th>
<th>Number of Beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brigham and Women’s Hospital/3</td>
<td>Neuroscience Intermediate Care</td>
<td>43</td>
</tr>
<tr>
<td>Brigham and Women’s Hospital/2</td>
<td>Medical Intermediate Care</td>
<td>31</td>
</tr>
<tr>
<td>Brigham and Women’s Hospital/2</td>
<td>Oncology</td>
<td>20</td>
</tr>
<tr>
<td>Montefiore Medical Center/1</td>
<td>Medical Intermediate Care</td>
<td>36</td>
</tr>
</tbody>
</table>
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

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

Use this mobile app with your nurse to complete your fall risk assessment and to develop a personalized fall prevention plan. This app is part of a research project called Patient-centered Fall Prevention. Thank you for agreeing to participate in this study to improve patient safety at our hospital.

Do your Assessment
View Your Plan

Status: Changes Pending Approval

Your Fall Prevention Interventions
Here's what you can do with your nurses to prevent falling.

- Communicate recent falls
- Assist to Bathroom, Every 1 Hour
- Use Cane
- IV Assistance when walking
- 2 People assist
- Bed Alarm On

Update Plan
Patient Portal: Fall TIPS

Patti’s Plan of Care

Room #: 4C-561

Status: Approval Pending

Below are your selected Fall Risk Factors.

- Medication Side Effects
- Walking Aid
- IV and/or Equipment
- Unsteady Walk
- Forget or Choose not to Call

Your suggested plan of care is

- Assistance with Bathroom needed every 2 hour(s)
- Use Cane
- IV Assistance when walking
- 1 Person assist
- Bed Alarm On

Update Plan
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

Patti’s Plan of Care

To help your patient
- Turn Often
- Meds Only No Food or Drink
- Prevent Catheter Infection
- Take Meds to Prevent Ulcer
- Use Restraints for Safety

To help your patient prevent falls
- Communicate Recent Falls
- Ask for Help to Walk with IV Pole
- Use Crutches
- Ask for Help with Commode
- Ask for One Person to Assist You Out of Bed
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!
Thank You: BWH/NEU Patient Safety Learning Lab Team

Brigham and Women’s Hospital
- David Bates
- Alex Businger
- Sarah Collins
- Brittany Couture
- Anuj Dalal
- Patricia Dykes
- Sarah Khorasani
- Lisa Lehmann
- Emily Leung
- Stuart Lipsitz
- Eli Mlaver
- Ronen Rozenblum
- Jeffrey Schnipper
- Kumiko Schnock

Partners HealthCare
- Frank Chang
- Ramesh Bapanapalli
- Mohan Babu Ganasekaran
- Gennady Gorbovitsky

Northeastern Institute of Healthcare Systems Engineering
- James Benneyan
- Corey Balint
- Jennifer Coppola
- Nicholas Fasano
- Zachary Katsulis
- Meredith Clemmens
- Lindsey Baldo
- Awatef Ergai
- Dominic Breuer
- Jillian Hines
- Jessica Cleveland

Patient-centered Fall Prevention
- Patricia Dykes
- Emily Leung
- Awatef Ergai
- Jillian Hines
- Zachary Katsulis
- Ramesh Bapanapalli
- Mohan Babu Ganasekaran
- Jason Adelman
- Maureen Scanlan