

## HIMSS Davies Award Enterprise Application

### --- Cover Page ---

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<b>Menu Item:</b>	Reduction of Hospital Acquired Pressure Ulcers

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#### **NPSG or NPP**

National Patient Safety Goal  
National Priorities Partnership

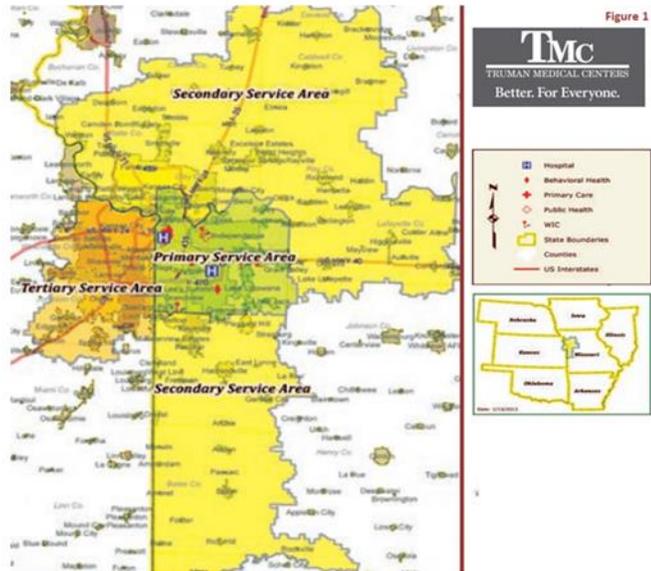
#### **Goal**

Reduce the risk of healthcare associated infections  
Safety: Improve liability and eliminate errors wherever  
and whenever possible

#### **Executive Summary:**

As one of the leading providers of uncompensated care in the state of Missouri, it was critical for Truman Medical Centers (TMC) to deploy a system-wide EHR that would transform the quality of care and advance the health of the community. Since the launch of the EHR in 2009, the development of enhanced workflows and data-driven processes has enabled our health system to prevent common harmful events from reaching the patient. One particular project that has made a significant impact in patient safety is the targeted reduction of hospital acquired pressure ulcers (HAPUs). Beginning in 2012, TMC integrated a variety of evidenced-based interventions that significantly decreased the incidence of HAPUs by 78 percent across our hospitals and generated savings exceeding \$4 million. The project continued in 2013 to ensure the new processes were implemented reliably to sustain a consistently low rate. As of September 2014, the corporate percent of discharged patients with HAPU is at 0.58. This project is one replicable example of how TMC is integrating information technology with quality improvement efforts to provide accessible, state-of-the art quality healthcare to the community, regardless of one's ability to pay.

1. **Background Knowledge:** As a multifaceted, not-for-profit health system, Truman Medical Centers (TMC) consists of two academic acute care facilities with 600 total beds, more than 50 outpatient clinics, a behavioral health program, the county health department and a long-term care facility. Our geographic service area (Fig. 1) is home to more than 700,000 people, and includes the city's urban core along with suburban and rural communities



that surround the Kansas City metropolitan area. TMC serves a number of low income, high risk patients that generate some of the highest costs when compared to the general population. The patient population also includes a significant number of uninsured patients. In fact, TMC is the provider 11 percent of all uncompensated care within the state of Missouri, at a cost of \$130 million.

TMC embraced a fundamental shift in how we would deliver health care with the launch of our system-wide EHR in July 2009. We partnered with Kansas City-based Cerner Corporation to implement the *Millennium* EHR across our hospitals – a clinical transaction database platform we call eCare. eCare encompassed the functionality to meet the unique needs of the Acute, Ambulatory, Behavioral Health and ED areas, while fulfilling demands for device integration, robust reporting and Meaningful Use compliance. Improved patient outcomes, however, were always the utmost priority. To ensure the implementation centered on quality and patient safety, senior executives from both hospitals joined forces to launch "Q<sup>6</sup>: Quality to the sixth power." Q<sup>6</sup> is TMC's system-wide quality improvement initiative founded upon the Institute of Medicine's (IOM) 6 Aims of Quality improvement. It embodies TMC's vision to lead to a healthier community through its targeted efforts to drive quality and operational improvement using actionable data from the EHR. Q<sup>6</sup> quickly became part of our daily culture, and led to the formation of multiple interdisciplinary teams comprised of nursing, physician and IT representatives that continue to drive improvements across clinical and business processes. The collective efforts of these teams have contributed many of TMC's clinical and operational outcomes since the launch of eCare, including the reduction in HAPUs.

2. **Local Problem being addressed and Intended Improvement:** The prevalence of preventable, harmful events like HAPUs make them a nationwide target for reduction.

According to AHRQ, more than 2.5 million people in the United States develop pressure ulcers each year. Although TMC had a system-wide HAPU treatment policy in place prior to eCare and Q<sup>6</sup>, the limited capabilities of the previous hybrid record made it a challenge to consistently track HAPU risk (let alone prevent it ahead of time). Unbeknownst to clinicians, there were also multiple devices that were contributing to the condition. In fact, 33% of HAPUs in 2012 and 32% in 2013 were caused by devices. Without preventative technology and analytical data to monitor these factors, the treatment policy was ineffective at monitoring and preventing HAPU risk.

Following the launch of eCare, TMC targeted HAPU reduction as one of the Q<sup>6</sup> quality improvement projects. A collaborative team of nursing quality, nursing informatics, medical informatics and direct care staff began investigating the data and embedding evidence-based practices into the nursing workflow. The objective was to empower clinicians to leverage analytical data and enhanced workflow in the EHR to not only identify HAPU risk, but prevent the condition ahead of time.

3. **Design and Implementation:** Beginning in early 2012, TMC launched a step-by-step approach to integrate a variety of interventions to reduce the prevalence of hospital-acquired pressure ulcers (HAPU) in our two-hospital system. Starting with the basics, the first step was to make turn clocks and turn teams a standard of practice for all nurses. In mid-2012, a team comprised of nursing quality, nursing informatics, medical informatics and direct care staff (inclusive of wound care) developed an evidence-based HAPU protocol using eCare technology. The protocol was designed to measure and identify HAPU risk based on the Braden Scale, and prompt prophylaxis for patients at risk of the condition.

The protocol was phased in one unit at a time, beginning with the TMC downtown campus' critical care units, then its telemetry units and medical-surgical units, and finally expanding to the entire suburban campus by the end of 2012. Meanwhile, a wound care champion was trained on each unit to answer process-related questions in real-time. Following implementation, the team audited frontline nurse compliance, using lapses as learning and training opportunities.

Analysis continued in September 2013 when the team conducted an environmental study with the pressure ulcer prevalence survey. In one day of rounding, they identified 52 devices that could cause HAPUs, which urged a retrospective look at 2012 and 2013 HAPU data. They discovered that 33% of HAPUs in 2012 and 32% in 2013 were caused by devices, and that oxygen tubing was the leading contributor to the condition. The finding prompted immediate action to replace the oxygen tubing with a safer material as a means to further prevent the recurrence of HAPUs.

4. **How was Health IT Utilized?:** Our HAPU protocol was integrated in the nursing workflow to prompt pressure ulcer prophylaxis for patients identified at risk for pressure ulcers based

on their Braden Scale scores. The protocol outlines how to apply, maintain, and change prophylactic dressings, and aligns with industry evidence that protective dressings can be an effective component of HAPU prevention strategies. The protocol is also used in the critical care units for patients who are on ventilators or vasopressors, or are hemodynamically unstable.

Designed as a prevention algorithm (Fig. 2), the HAPU protocol is initiated from the following sequence of events:

1. A new patient is admitted. The RN or LPN charts on the Skin/Fall Assessment (Fig. 3) and Adult Admission Assessment. These are fired to the Nursing Task List (Fig. 4) from the Nursing Admission Power Plan.

2. The RN or LPN documents the patient's Braden assessment in the flowsheet (iView). Once the documentation is signed, a Braden score (Fig. 5) is determined.

3. A Braden score of less than 13 generates an automatic wound care consult (Fig. 6) and nutrition consult. A Braden score of less than 18 fires a task to the Nursing Task List to add 'Initiate Pressure Ulcer Care Plan.'

4. The care plan is built with default recommendations that align with pressure ulcer prevention measures. The RN has the ability to customize it to the patient's needs by selecting or unselecting Outcomes and Interventions (Fig. 7), and can accept the default recommendations by initiating the care plan.

5. After signing the orders from the Prevention Phase of the Nursing Care Plan, the task, 'Education Wound Care,' displays on the RN's Nursing Task List.

6. The RN clicks on the task 'Education Wound Care' and selects 'Chart' to open the Education Wound Care section (Fig. 8) of the flowsheet to complete the education documentation.

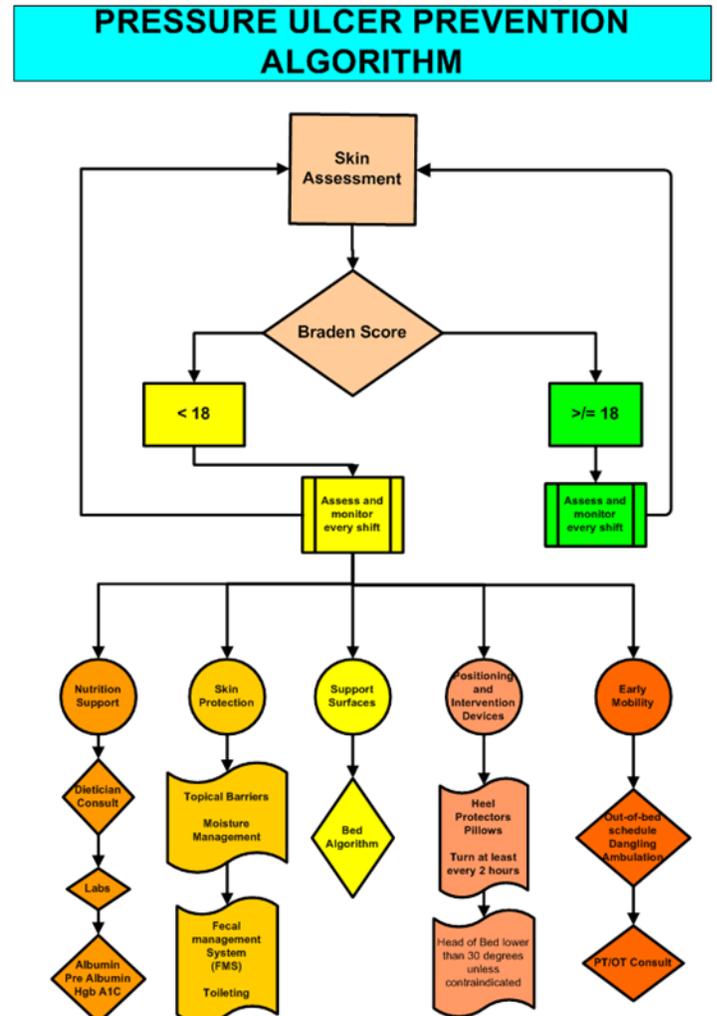


Figure 2

7. Charting 'Wound Care Education' within the flowsheet completes the Prevention Phase and populates a green checkmark in the Nursing Care Plan (Fig. 9).

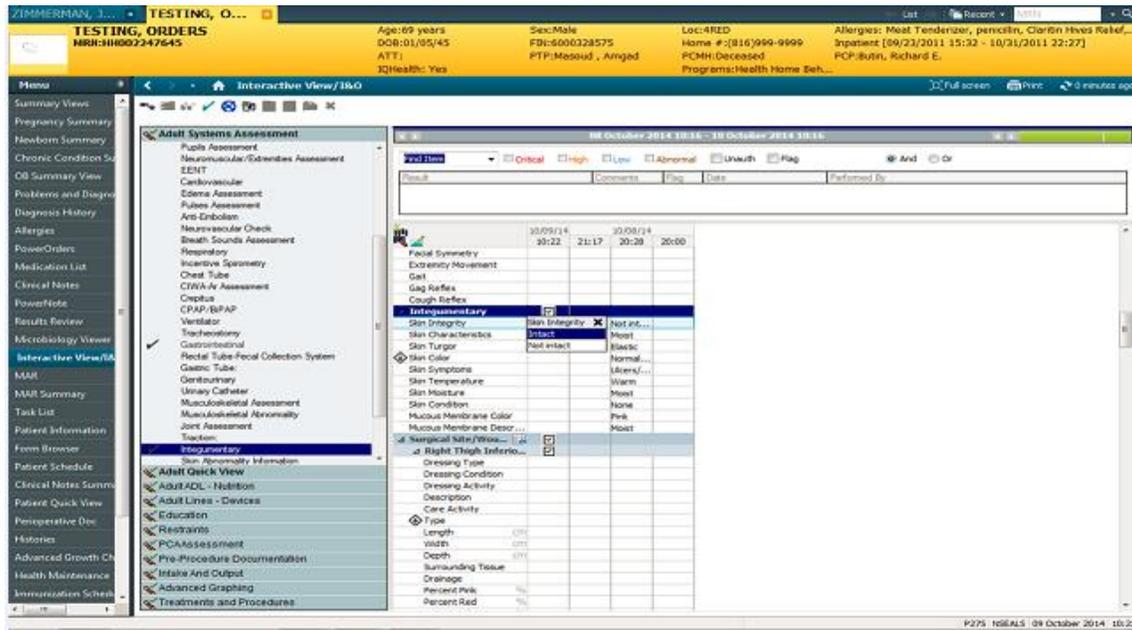


Figure 3

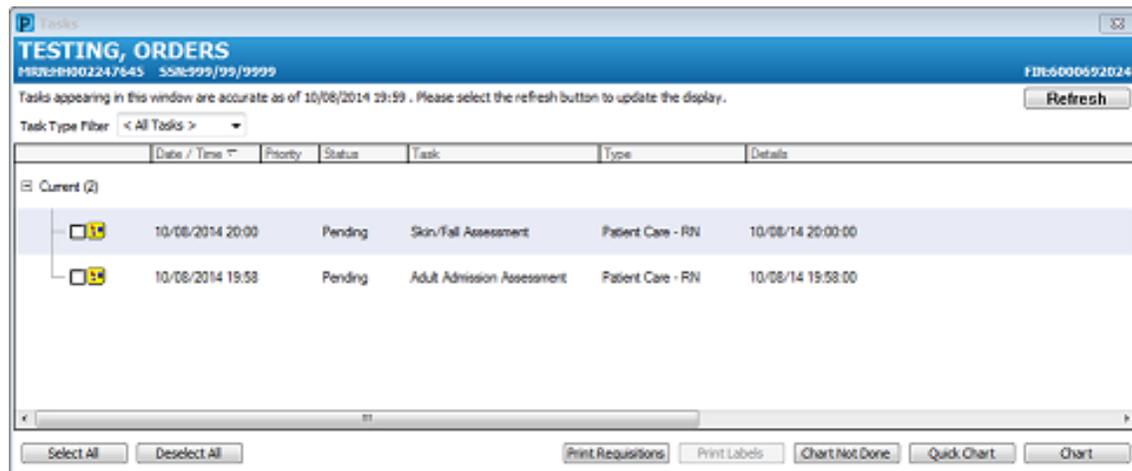


Figure 4

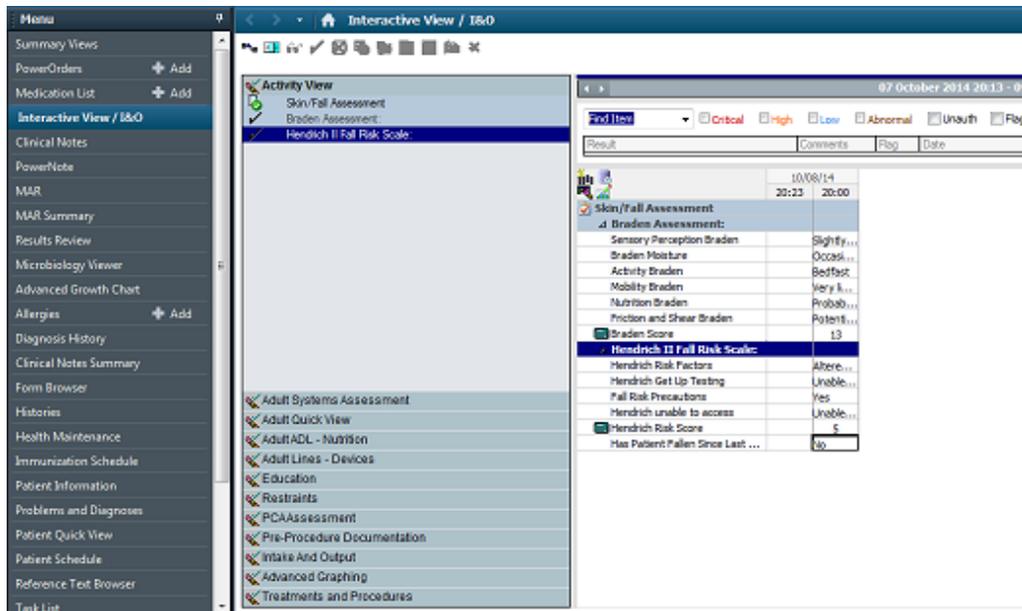


Figure 5

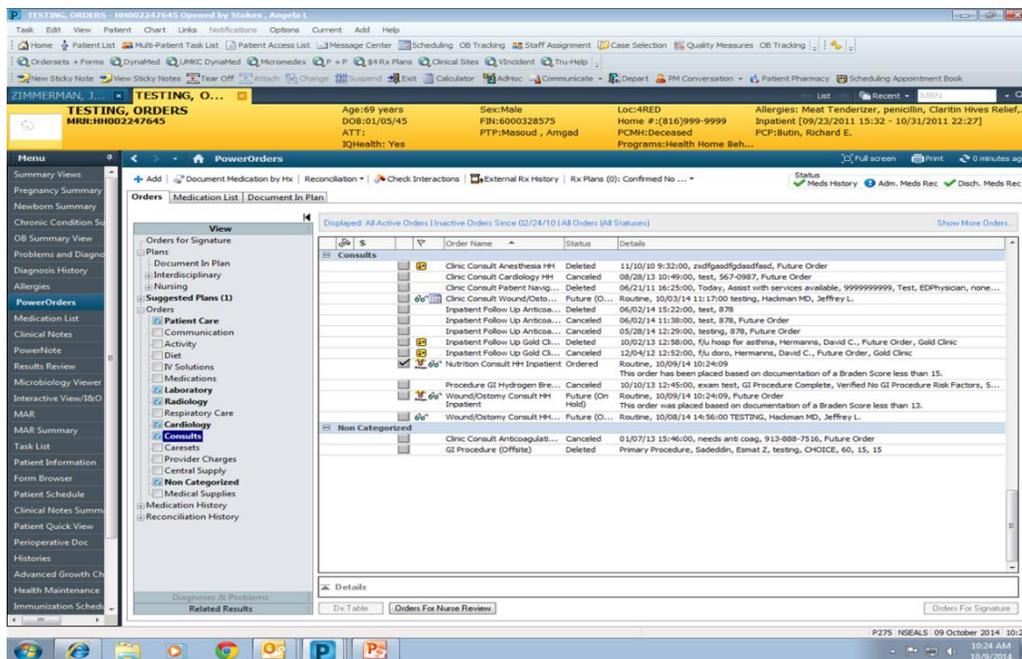


Figure 6

PowerOrders

+ Add | Document Medication by Hx | Reconciliation + | Check Interactions | External Rx History | Rx Plans (0): In Process

Orders Medication List Document In Plan

+ Add to Phase | Start: Now | Duration: None

Component	Status	Details
<b>Outcomes</b>		
<input checked="" type="checkbox"/> Reviewed/Updated-Pressure Ulcer Prevention	During Phase	
<input checked="" type="checkbox"/> SPOC Prioritization-Pressure Ulcer	During Phase	
<input checked="" type="checkbox"/> Verbalizes Understanding Pressure Ulcer Risk Factors	By Phase End	
<input checked="" type="checkbox"/> Participates in Pressure Ulcer Prevention Activities	By Phase End	
<input checked="" type="checkbox"/> The patient will be free of pressure ulcers	By Phase End	
<input checked="" type="checkbox"/> Educate on Positioning Techniques	During Phase	
<input checked="" type="checkbox"/> Educate on Pressure Ulcer Pt Specific Risk Factors	During Phase	
<input checked="" type="checkbox"/> Educate on Skin Care	During Phase	
<b>Interventions</b>		
<input type="checkbox"/> Support affected extremities/Elevate heels	During Phase	
<input type="checkbox"/> Heel protector in place	During Phase	
<input type="checkbox"/> Elbow protector in place	During Phase	
<input type="checkbox"/> Follow Bed Algorithm	During Phase	
<input type="checkbox"/> Follow Pressure Ulcer Prevention Algorithm	During Phase	
<input type="checkbox"/> Encourage highest degree of mobility to avoid pressure on ...	During Phase	
<input type="checkbox"/> Maintain sufficient fluid intake for adequate hydration	During Phase	
<input type="checkbox"/> Encourage room exercises and weight bearing mobility whe...	During Phase	
<input type="checkbox"/> Routine integumentary assessment daily	During Phase	
<input type="checkbox"/> Keep skin clean and dry, skin protection barrier used	During Phase	
<input type="checkbox"/> Assess dressing and/or wound site at least every shift an...	During Phase	
<input type="checkbox"/> Include the patient and family member, significant other or caregiver in pressure ulcer prevention activities, if possible	During Phase	
<input type="checkbox"/> Evaluate patient and family's cooperation with plan for mai...	During Phase	

Details

Figure 7

Interactive View / I&O

10/08/14 23:30 - 23:26

And/Or

Result	Comments	Flag	Date	Performed By
<b>10/08/14 23:30 - 23:26</b>				
<b>Skin &amp; Wound Education</b>				
<b>Prevention</b>				
	Positioning Techniques	Verbal...		
	Pressure Ulcer Patient Risk Fa...	Verbal...		
	Skin Care (Educ)	Verbal...		
	Skin Assessment (Educ)	Verbal...		
	Pressure Point Identification	Demon...		
	Report Skin Change to Health...	Verbal...		
<b>Wound Management</b>				
	Pressure Ulcer Definition and ...	Demon...		
	Wound Care and Cleansing	Verbal...		
	Dressing Types and Changes	Verbal...		
	Debridement	Verbal...		
	Wound Healing Principles	Verbal...		
	Nutrition and Wound Healing	Verbal...		
	Wound Signs/Symptoms of Inf...	Verbal...		

Activity View

- Skin & Wound Education
- Prevention
- Wound Management
- Adult Systems Assessment
- Adult Quick View
- Adult ADL - Nutrition
- Adult Lines - Devices
- Education
- Restraints
- PCA Assessment
- Pre-Procedure Documentation
- Intake And Output
- Advanced Grapting
- Treatments and Procedures

Figure 8

Description	Last Evaluated	Target	Status
Pressure Ulcer Prevention and Management, Pressure Ulcer Prevention (Initiated) 10/08/2014 23:26			
Reviewed/Updated-Pressure Ulcer Prevention		Phase End	✓
SPOC Prioritization-Pressure Ulcer		Phase End	✓
Verbalizes Understanding Pressure Ulcer Risk Factors		By Phase End	✓
Participates in Pressure Ulcer Prevention Activities		By Phase End	✓
The patient will be free of pressure ulcers		By Phase End	✓
Educate on Positioning Techniques	10/08/2014 23:26	Phase End	✓
Educate on Pressure Ulcer (PI) Specific Risk Factors	10/08/2014 23:26	Phase End	✓
Educate on Skin Care	10/08/2014 23:26	Phase End	✓
Support affected extremities/Elevate heels		Phase End	✓
Follow Bed Algorithm		Phase End	✓
Follow Pressure Ulcer Prevention Algorithm		Phase End	✓
Encourage highest degree of mobility to avoid pressure on skin		Phase End	✓
Maintain sufficient fluid intake for adequate hydration		Phase End	✓
Encourage room exercises and weight bearing mobility when possible		Phase End	✓
Keep skin clean and dry, skin protection barrier used		Phase End	✓
Assess dressing and/or wound site at least every shift and during dressing changes.		Phase End	✓
Evaluate patient and family's cooperation with plan for maintaining skin integrity		Phase End	✓
Use Transfer Device to Minimize Friction and Shear Forces		Phase End	✓
Collaborate With Provider for Cause and Tx of Incontinence		Phase End	✓
Collaborate With Provider for Nutrition Barrier		Phase End	✓

Figure 9

Once the protocol was live across our system, the team audited frontline nurse compliance and used lapses as additional training opportunities. Between the first audit in January 2013 and the final audit in March 2013, compliance improved from 50-60% to 80-90%.

Analytical data also exposed the high percentage of HAPUs that were directly attributable to devices in the hospital. In September 2013, environmental rounds were conducted with the pressure ulcer prevalence survey. Initially data was collected and entered manually, then compiled into a weekly report that not only revealed the number of HAPUs caused by devices, but also drilled down to the unit type, pressure ulcer location and contributing device that led to the condition. This analysis enabled the team to uncover oxygen tubing as the leading device and replace it with a safer material – another crucial step in preventing the number of HAPUs. In the future, in lieu of manual entry the team plans to automate the data collection and reporting processes to more efficiently monitor and identify any HAPU-causing devices.

**5. Value Derived/Outcomes:** Since 2012, our compliance with the prophylaxis protocol continues to grow beyond the 80-90 percent range. Nurses have become more familiar the technology and are aligning treatment more closely with evidence-based guidelines. Additionally, the project uncovered several HAPU-causing devices that have since been replaced with safer materials. Auditing and supplementary training have proved beneficial to overall adoption and success as well.

The conjunction of a preventative protocol, evidenced-based guidelines and data analysis has proven to be a powerful strategy for HAPU prevention. Since the onset of the project in 2012, these interventions reduced the prevalence of HAPUs by 78 percent across our

downtown and suburban campuses (Fig. 10<sup>1</sup>) and corresponded with savings exceeding \$4 million. As of September 2014, the corporate percent of discharged patients with HAPU is at 0.58. Most importantly, patients are receiving safer care and TMC is achieving improved clinical outcomes.

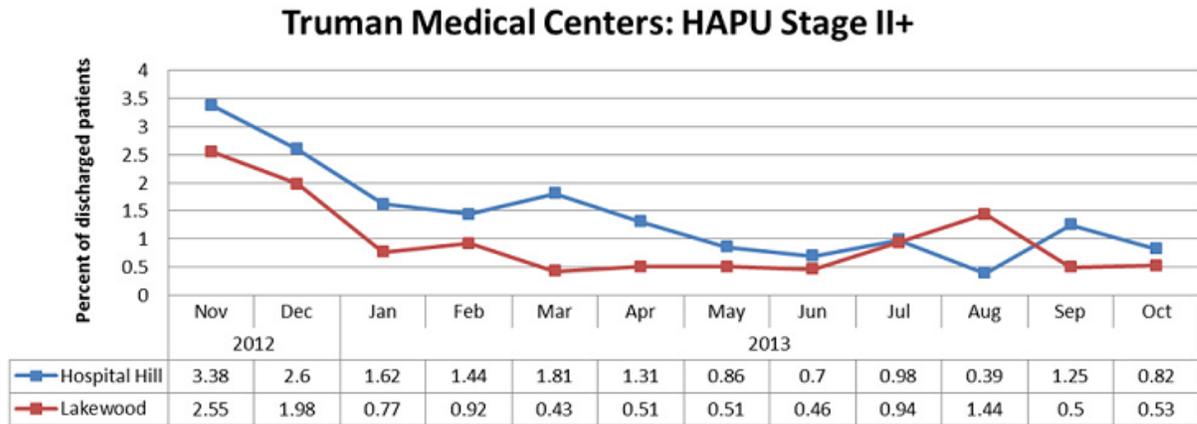


Figure 10

The success of the HAPU reduction project has spurred momentum to improve other devices and expand preventative efforts to increase patient safety. Going forward, the next step of the project will focus on increasing awareness and education about device-related pressure ulcers among staff.

**6. Lessons Learned:** The deployment of eCare has been an essential driver in empowering our health system to advance the quality of care. The ongoing resoluteness Q<sup>6</sup> has inspired multiple projects that have improved patient outcomes using actionable data from eCare. TMC’s success in HAPU reduction serves as a replicable example for other organizations working to prevent HAPUs and other hospital acquired conditions from reaching the patient. While there is always more work to be done to improve patient safety, we have learned the following best practices throughout this project:

1. Deploy a system-wide quality initiative to coincide with EHR implementation: A quality improvement initiative like Q<sup>6</sup> should become an integral part of an organization’s EHR implementation. For TMC, it has inspired the utilization of technology to drive measurable quality and operational improvements across our health system.
2. Assemble a multidisciplinary team to champion the change: For any quality improvement effort, assemble a multidisciplinary team with representation from all applicable areas to execute the plan and serve as champions for the change. For any

<sup>1</sup> While Figure 3 displays data from Nov. 2012-Oct. 2013, the reduction in HAPUs has continued into 2014. As of September 2014, the corporate percent of discharged patients with HAPU is at 0.58.

- patient safety project, participation from nursing, medicine, clinical informatics, direct care, quality and IT is recommended.
3. Incorporate industry evidence as preventative best practices: Find a way to incorporate best practices that correlate with industry evidence. For example, TMC's HAPU protocol outlines how to apply and maintain prophylactic dressings based on industry evidence of effective HAPU prevention strategies.
  4. Anticipate potential roadblocks to implementation: Formulate a plan to ensure easy access, storage and retrieval of EHR documentation. Data must be readily available and usable, otherwise unnecessary delays and preventable challenges will arise. Furthermore, equip your care team with all the necessary resources to successfully leverage a new technology or workflow. An initial barrier for the TMC team was having the prophylactic dressings available in all units, which consequently impacted nursing compliance with the HAPU protocol. As soon as each unit received its supply of dressings, compliance improved.
  5. Review lessons learned and best practices in advance: This case study as well as other educational materials will help with preparation for common barriers that may occur if implementing similar preventative efforts for the first time.
  6. Invest in auditing to uncover additional training needs: Following implementation of a new technology or workflow, invest time in auditing compliance with the new change. Initially compliance at TMC was less than optimal, but the team used lapses as opportunities for further education and training to boost adoption.
  7. Ensure your care environment does not contain harmful devices: Examine your current environment and EHR data to determine if there are any devices that could be causing HAPUs. In just one day of rounding, our HAPU reduction team identified 52 devices that could cause the condition. Removal or replacement of any HAPU-causing devices is an immediate contributor to prevention.
  8. Educate staff on potentially unknown risk factors: Expand preventative efforts with an education campaign to increase awareness of device-related pressure ulcers and evidence-based guidelines among staff.

**7. Financial Considerations:** TMC invested approximately \$18 million in the system-wide rollout of Q<sup>6</sup>. The IT hours resourced to quality improvement projects (including HAPU reduction) amounted to 5,757. Contracting for HAPU preventative technology included \$141,000 in implementation services and \$14,880 in annual fees for content and support.

The 78 percent reduction in HAPUs corresponded with savings exceeding \$4 million since the project began in early 2012. It also contributed to TMC's overall savings from improved clinical outcomes, an amount which has grown to \$8,380,621 since December 2009. As of September 2014, the corporate percent of discharged patients with HAPU is at 0.58. Most

importantly, the deployment of Q<sup>6</sup> with eCare technology and evidence-based guidelines is empowering clinicians in their ultimate goal to deliver safer patient care.