Patient CareLink

MASSACHUSETTS HOSPITAL QUALITY & PATIENT SAFETY

{2} IN A SERIES

Summary of Trends in Selected Nursing-Sensitive Care Measures in Massachusetts Hospitals and Related Cost Savings Estimates

The Massachusetts Hospital Association (MHA) and the Massachusetts Organization of Nurse Executives have organized hospitals throughout the state in a voluntary reporting program to reduce adult **pressure ulcer prevalence, patient falls**, and **falls with injury** in hospitals. Under PatientCareLink, acute care and specialty hospitals report quarterly data on these events following the measures identified in the National Quality Forum's "National Voluntary Consensus Standards for Nursing-Sensitive Care: An Initial Performance Measure Set" and further specified by The Joint Commission.

The hospital-specific measure data extends back from June 2010 for more than three years. Data for each hospital for the most recent reporting period may be viewed at **www.patientcarelink.org/hospital-data/performance-measures.aspx**. These data have been used as a foundation for collaborative efforts among hospitals to implement improvement programs and share best practices to reduce pressure ulcers and falls in hospitals.

PatientCareLink (www.patientcarelink.org) is the joint initiative of the Massachusetts Hospital Association and the Massachusetts Organization of Nurse Executives (MONE). Much of the data included in this report is available at PatientCareLink.org, along with hospital-specific staffing and quality-of-care data. In subsequent issues of the Massachusetts Hospital Quality & Patient Safety series, we'll bring you trend data and other reporting to give you the most transparent view available of the care you can expect to receive at Massachusetts hospitals.

Overview and Summary

MHA contracted with Abt Associates, Inc.* to analyze longitudinal trends of selected nursing-sensitive care measures in 70 acute care and 10 specialty care hospitals covering a period of time from the fourth calendar quarter of 2006 to the fourth quarter of 2009. This data set included more than 4,000 adult inpatient observations across 13 quarters of data and 80 hospitals. Abt researchers evaluated the data and performed a variety of analyses to understand and describe how hospital performance, as revealed by the measures, had changed over time.

Their report documents the data sources and analytical methods and describes their findings. **The report is available at http://www.patientcarelink.org/uploadDocs/1/PCL_ABT_Final.pdf**. A supplemental report from Abt estimated a range of hospital cost savings based on the trend data and published literature on the costs of pressure ulcers. **That report is available at http://www.patientcarelink.org/uploadDocs/1/PCL_ABT_PU.pdf**.

THE HIGHLIGHTS OF THE FINDINGS FROM THE STUDIES ARE AS FOLLOWS:

- **The statewide acute care hospital rate of pressure ulcer prevalence dropped nearly 36 percent from 3.15 percent in 2007 to 2.04 percent in 2009**, calculated as the sum of all hospital-acquired pressure ulcers (numerator) over the sum of all patients studied (denominator). The average acute care hospital pressure ulcer prevalence rate fell by nearly 53 percent between 2007 and 2009 (i.e., calculated by averaging each hospital's rates). This change was statistically significant (i.e., highly unlikely to be due to chance).
- **The statewide specialty hospital pressure ulcer prevalence rate dropped 44 percent over the period, from 3.43 percent in 2007 to 1.92 in 2009.** The average specialty hospital (rehabilitation and long-term acute care) pressure ulcer prevalence rate fell by nearly 27 percent between 2007 and 2009. This change was not statistically significant, in part because the number of hospitals in this population was very small.
- **The statewide acute care hospital patient fall rate per 1,000 patient days dropped by just over 4 percent over the period, from 3.11 per 1,000 to 2.98 per 1,000. The average acute care hospital patient fall rate was nearly unchanged**, dropping 2 percent between 2007 and 2009. This change was not statistically significant. The findings for the rate of patient falls with injury in acute care hospitals showed a similar pattern of a small, but not statistically significant, decline.
- **Specialty hospital patient-fall and fall-with-injury rates, similar to acute care hospitals, saw modest, but not statistically significant, declines.**
- Extrapolating the findings from the quarterly one-day PatientCareLink pressure ulcer prevalence studies to an estimate of the number of **hospital acquired pressure ulcers** that occur on an annual basis, **estimates of reductions in cost for Massachusetts acute care hospitals ranged from $18.3 million to $148.3 million over a two-year period** (from 2007 – 2009, using 2007 as the baseline year), depending on the specific cost estimate used in the calculation. For Massachusetts **specialty care hospitals, comparable estimates of a two-year cost reduction ranged from $353,000 to $2.9 million**.

*Cambridge, MA-based Abt Associates applies scientific research, consulting and technical assistance expertise to a wide range of issues in social, economic, and health policy. It is one of the largest for-profit government and business research and consulting firms in the world with a staff of more than 1,700 employee-owners including national and international experts who are recognized for their knowledge, innovative research techniques, and insightful analyses and recommendations.

Data and Analysis

MHA supplied Abt Associates data on three nursing-sensitive quality measures that was voluntarily reported by acute care and specialty hospitals (rehabilitation and long-term acute care hospitals) covering patient care in 70 acute care and 10 specialty care hospitals over the period from the fourth calendar quarter of 2006 to the fourth quarter of 2009.

The three nursing-sensitive quality measures were among a set of measures that the National Quality Forum (NQF) endorsed in 2004.[1] The three measures are:

- **NSC-2 Pressure Ulcer Prevalence:** a measure of the percent of adult patients with qualifying hospital acquired pressure ulcers observed in designated inpatient unit-types during a one-day-per-calendar-quarter prevalence study.
- **NSC-3 Patient Falls:** a measure of the number of qualifying patient falls, with or without injury to the patient, in designated inpatient unit-types over a 3-month time period expressed per 1,000 patient days.
- **NSC-3 Falls with Injury:** a subset of the Patient Falls measure for falls that resulted in an injury defined as minor or greater, also expressed per 1,000 patient days.

The PatientCareLink project employed detailed technical specifications of the three measures developed by The Joint Commission, the leading hospital accrediting agency, to guide and promote uniform hospital data collection and reporting.[2] Current NQF measure descriptions may be found at the links identified at endnote 3.[3]

The measure data were collected and reported to Abt for each hospital aggregated at the following five unit-types in acute care hospitals:

- Adult Critical Care
- Adult Step Down
- Adult Medical
- Adult Surgical
- Adult Medical-Surgical

Data for specialty care hospitals were reported for the following units or types of facilities:

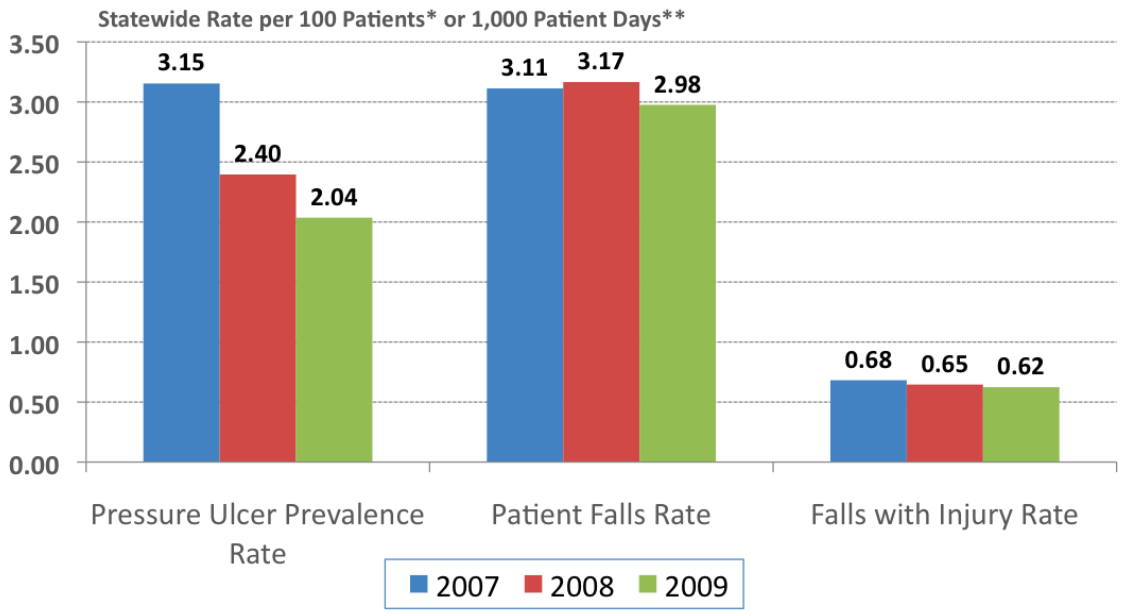
- Adult Rehabilitation
- Adult Rehabilitation Long-Term Acute Care
- Adult Skilled Nursing Facility Long-Term Acute Care
- Adult Medical Long-Term Acute Care
- Adult Medical-Surgical Long-Term Acute Care

The Abt analysis and full report looked at unit-type trend results and trend data for all units combined, which is the focus of this summary.

Findings

FIGURE 1

Pressure Ulcer Prevalence, Patient Falls, and Falls with Injury in Massachusetts Acute Care Hospitals, All Eligible Unit-types Combined 2007 – 2009



Note: *Per 100 patients for pressure ulcer prevalence, **Per 1,000 patient days for patient falls and falls with injury.

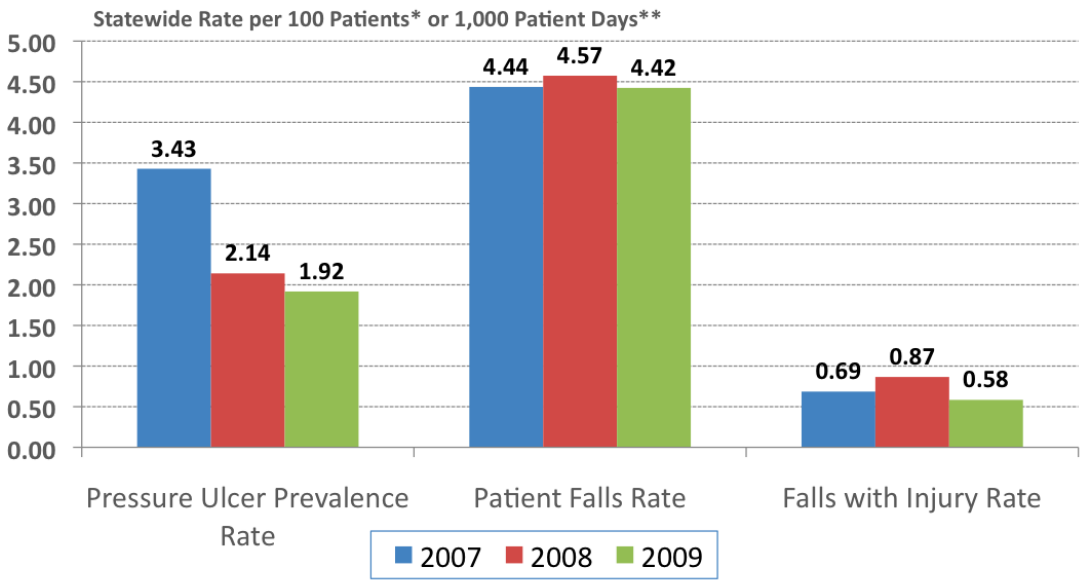
Source: Abt Associates, Inc. analysis of hospital-reported PatientCareLink data

Figure 1 displays the statewide measure rates for each of the three measures for acute care hospitals for the three years studied. The **statewide acute care hospital pressure ulcer prevalence rate** dropped nearly 36 percent over the period, from 3.15 percent in 2007 to 2.04 percent in 2009, calculated as the sum of all hospital-acquired pressure ulcers (numerator) over the sum of all patients studied (denominator). The average hospital pressure ulcer prevalence rate (not displayed) fell by nearly 53 percent between 2007 and 2009 (i.e., the average of each hospital's rates). This change was statistically significant (i.e., highly unlikely to be due to chance).

The **statewide acute care hospital patient fall rate** per 1,000 patient days dropped by just over 4 percent over the period, from 3.11 per 1,000 to 2.98 per 1,000. The statewide rate is calculated as the sum of all qualifying falls (numerator) over the sum of all patient days during the time period studied. The average acute care hospital patient fall rate was nearly unchanged, dropping 2 percent between 2007 and 2009. This change was not statistically significant. The findings for the **rate of patient falls with injury in acute care hospitals** showed a similar pattern of a small, but not statistically significant, decline.

FIGURE 2

Pressure Ulcer Prevalence, Patient Falls, and Falls with Injury in Massachusetts Specialty Hospitals, All Eligible Unit-types Combined 2007 – 2009



Note: *Per 100 patients for pressure ulcer prevalence, **Per 1,000 patient days for patient falls and falls with injury.

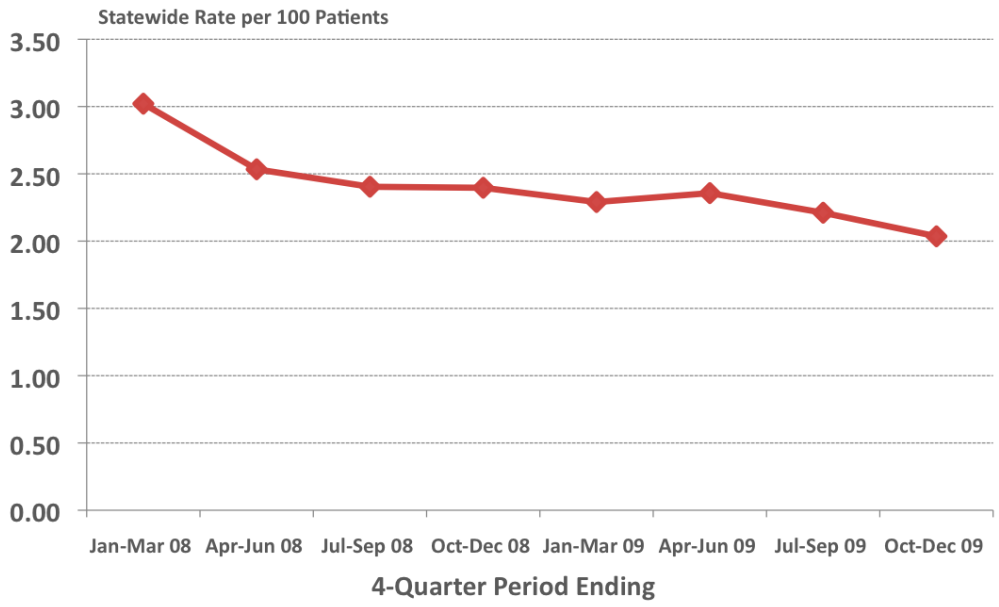
Source: Abt Associates, Inc. analysis of hospital-reported PatientCareLink data

Figure 2 displays the statewide measure rates for each of the three measures for specialty hospitals (rehabilitation and long-term acute care) for the three years studied. The **statewide specialty hospital pressure ulcer prevalence rate** dropped 44 percent over the period, from 3.43 percent in 2007 to 1.92 in 2009. The average specialty hospital (rehabilitation and long-term acute care) pressure ulcer prevalence rate fell by nearly 27 percent between 2007 and 2009. This change was not statistically significant, in part because the number of hospitals in this population was very small.

Specialty hospital patient fall and fall with injury rates, similar to those in acute care hospitals, saw modest, but not statistically significant, declines. A statistically significant decline might be measured if more quarters of data were used and the modest reductions continued over time.

FIGURE 3

Hospital-Acquired Pressure Ulcer Prevalence, Rolling 4-Quarter Statewide Rate, Massachusetts Acute Care Hospitals, All Eligible Unit-types Combined 2007 – 2009



Source: Abt Associates, Inc. analysis of hospital-reported *PatientCareLink* data

Figure 3 illustrates how the **statewide acute care hospital pressure ulcer prevalence rate** dropped over eight consecutive rolling four-quarter periods ending in the periods displayed on the horizontal axis.

Following the completion of the trend analysis, MHA asked Abt Associates to expand their analysis to estimate the amount of the cost savings that would be associated with the drop in pressure ulcer prevalence in acute care and specialty hospitals.

Cost Reduction Estimates

To obtain cost reduction estimates, Abt analysts combined their prior estimates of pressure ulcer rate reductions in Massachusetts hospitals with cost estimates derived from the literature. They conducted a literature review to identify peer-reviewed articles and other published reports from industry providing estimates of pressure ulcer costs in hospital settings. The review identified three cost estimates from two high-quality articles that appeared to be most generalizable to Massachusetts hospitals.[4] The three incremental cost estimates reported in these two articles varied widely, ranging from $2,728 to $22,124 per pressure ulcer,[5] reflecting important variations in pressure ulcer measurement and estimation methodology.

Abt analysts combined these three cost estimates with their previous estimates of the reductions in pressure ulcers from 2007 to 2008, from 2008 to 2009, and from 2007 to 2009 to obtain estimates of cost reductions.

Considering only the pressure ulcers measured during the quarterly one-day reporting period, for acute care hospitals, estimates of reductions in cost ranged from $521,107 to $4.2 million over a two-year period (from 2007 – 2009, using 2007 as the baseline year), depending on the specific cost estimate used in the calculation. For specialty care hospitals, comparable estimates of the two-year cost reduction ranged from $68,208 to $553,107.

Extrapolating the findings from the quarterly one-day reporting period to an estimate of the number of hospital-acquired pressure ulcers that occur on an annual basis, estimates of reductions in cost for acute care hospitals ranged from $18.3 million to $148.3 million over a two-year period (from 2007 – 2009, using 2007 as the baseline year), depending on the specific cost estimate used in the calculation. For specialty care hospitals, comparable estimates of a two-year cost reduction ranged from $353,179 to $2.9 million (Table 1). The wide range of the cost reduction estimates reflects the wide variation in cost estimates from the literature.

TABLE 1: Estimated Reduction in Annual Costs Associated with Pressure Ulcers, Massachusetts Hospitals 2007 – 2009

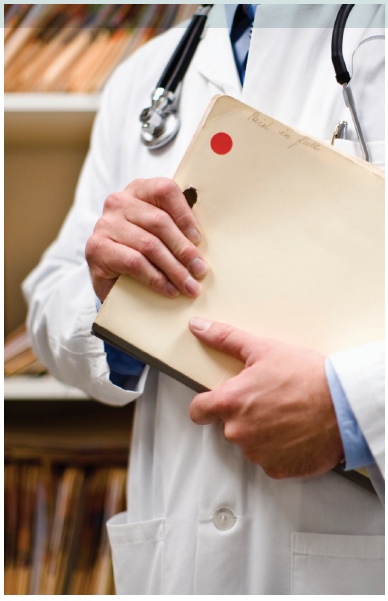
		Cost Per Pressure Ulcer Estimate		
Hospital Type & Period	Pressure Ulcer Reduction Estimate	Allman, Goode, Burst (1999) $2,728	Allman, Goode, Burst (1999) $22,124	Russo, Steiner Spector (2006) $11,370
Acute Care Hospitals				
Between 2007 and 2008	4,111	$11,215,382	$90,956,417	$46,744,462
Between 2008 and 2009	2,591	$7,067,646	$57,318,403	$29,457,162
Between 2007 and 2009	6,702	$18,283,028	$148,274,820	$76,201,623
Specialty Hospitals				
Between 2007 and 2008	69	$187,568	$1,521,167	$781,760
Between 2008 and 2009	61	$165,612	$1,343,104	$690,250
Between 2007 and 2009	129	$353,179	$2,864,272	$1,472,011

Numbers may not sum due to rounding of decimals.

Conclusion

The statewide acute care hospital rate of pressure ulcer prevalence rate dropped from 3.15 percent in 2007 to 2.04 percent in 2009, a decline of nearly 36 percent. The statewide specialty hospital pressure ulcer prevalence rate dropped 44 percent over the period, from 3.43 percent in 2007 to 1.92 in 2009. The rates for falls and falls with injury have remained relatively flat during this period. It is difficult to detect changes in these measures because they are relatively rare events.

Extrapolating quarterly single-day measures to create an annual estimate of the number of hospital acquired pressure ulcers in MHA hospitals, and combining those estimates with published estimates of the financial costs of pressure ulcers, Abt Associate analysts estimate that the savings in costs from these pressure ulcer reductions ranged from $18.7 million to $151.2 million for acute care and specialty hospitals combined between 2007 and 2009.



END NOTES

[1] National Voluntary Consensus Standards for Nursing-Sensitive Care: An Initial Performance Measure Set, Consensus Report, Washington, DC, 2004.

[2] The Implementation Guide for the NQF Endorsed Nursing-Sensitive Care Performance Measures, Version 1.00, The Joint Commission on Accreditation of Healthcare Organizations, Oakbrook Terrace, Illinois, December, 2005.

[3] http://www.qualityforum.org/MeasureDetails.aspx?SubmissionId=1117#k=pressure&e=1&st=&sd=&s=n&so=a&p=1&mt=&cs= (NSC-2)
http://www.qualityforum.org/MeasureDetails.aspx?SubmissionId=1118#k=falls&e=1&st=&sd=&mt=&cs=&s=n&so=a&p=1 (NSC-3)
http://www.qualityforum.org/MeasureDetails.aspx?SubmissionId=1119#k=falls&e=1&st=&sd=&mt=&cs=&s=n&so=a&p=1 (NSC-4)

[5] Allman RM, Goode P, Burst N, Bartolucci A, and Thomas D. Pressure ulcer, hospital complications, and disease severity: Impact on hospital costs and length of stay. *Advances in Wound Care* 1999; 12(1):22-30. (and) Russo CA, Steiner C, and Spector W. Hospitalizations Related to Pressure Ulcers, 2006. HCUP Statistical Brief #64. 2008, Agency for Healthcare Research and Quality, Rockville, MD. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb64.pdf.

[5] Cost estimates are reported in 2009 dollars.

MHA Massachusetts Hospital Association

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