

# OUTCOME STUDY

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## Saint Thomas Health Services (STHS): Clinical Outcomes

People, Process and Technology – Combining the best of each to improve clinical and financial outcomes

### Background

Saint Thomas Health Services (STHS) is the leading faith-based health care system in Tennessee, and is a part of Ascension Health, the largest not-for-profit health care system in the United States. STHS is a family of four hospitals including Saint Thomas (571 beds) and Baptist (683 beds) Hospitals, Middle Tennessee Medical Center (286 beds), and Hickman Community Hospital (25 beds).



One of Ascension Health's strategic directions and "Call to Action" is to provide "Healthcare that is Safe". STHS set out to meet the aggressive goal of eliminating adverse patient events and joined Ascension Health's "Journey to Zero" to eliminate pressure ulcers, falls, ventilator associated pneumonias, preventable mortalities, blood stream infections and perinatal birth trauma.



STHS invested \$9,033,412 in house-wide bed replacements (over 1,000 beds) in March/April 2008. This included a combination of VersaCare A.I.R.® and TotalCare SpO<sub>2</sub>RT® beds with integrated therapeutic support surfaces. Also during this same time frame, conversion of rental therapy from another supplier to Hill-Rom was completed.

### Purpose

The purpose of this analysis was to document the effectiveness of Hill-Rom technology as part of an overall program to reduce preventable adverse events. One was to demonstrate improvement in patient outcomes through the use of Hill-Rom® advanced integrated "therapy on demand" surfaces for skin, pulmonary and mobility support. A second purpose was to demonstrate the impact of bed exit alarms in conjunction with a falls prevention program in maximizing patient safety and decreasing the incidence of falls. And thirdly, to demonstrate the correlation between the use of standardized clinical processes with standardized frames and service on improved clinical outcomes and the impact on rental therapy requirements.

### Methods

As the beds and surfaces were being installed within the facilities, consistent education through eLearning modules (collaboratively created by Ascension Health and Hill-Rom) combined with hands-on skills assessment and training was implemented throughout the system. In order to optimize patient outcomes, clinical commitment to protocol/process standardization for Pressure Ulcers, Falls Risk/Prevention, and Pulmonary/Mobility was critical. Beginning in 2004, evidence-based clinical bundles were implemented as a part of the initiative to eliminate adverse patient events. Adoption of these bundles prior to bed conversion provides definition between policy implementation and product implementation and further validates the impact of the technology.

Data was collected on pressure ulcer prevalence, ventilator associated pneumonia, patient falls with serious injury, and rental therapy costs prior to bed placement and one year post implementation. Actual data from STHS was used and benchmarked against Ascension Health and national averages. Baseline data included the twelve month results from FY07, 08 and 09 (FY runs from July through June).

It is important to note that the cost of new frames is taken in its entirety, however, a patient bed is a room requirement. STHS had an aging fleet of beds that did not meet their current safety and quality requirements. The true clinical ROI is insuring that all patients, not a selected subset of high risk patients, should be on the right surface to prevent pressure ulcers, the right frame with integrated alerts to prevent falls, and the right therapeutic support to reduce pneumonia and facilitate early mobility.



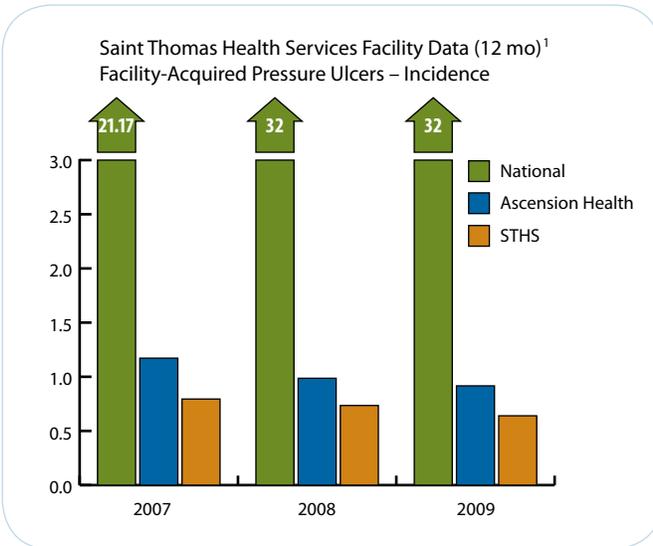
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### Results

Improvements in all outcome categories were considerably better than Ascension Health “System Average” which has consistently been significantly better than national averages.



### Facility-Acquired Pressure Ulcers

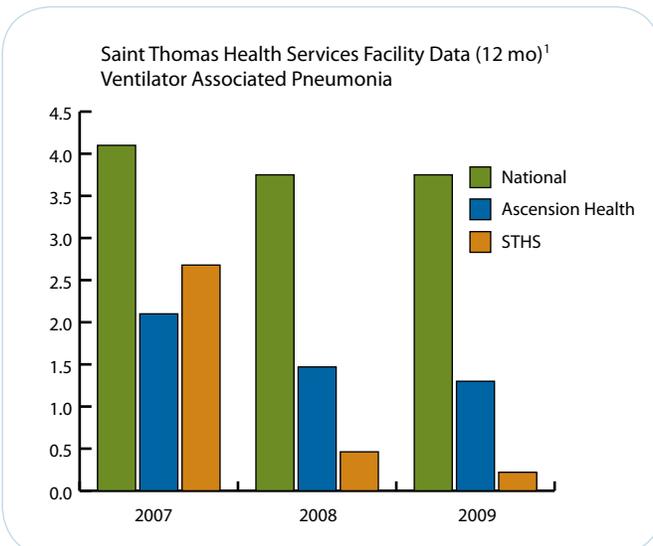
Facility-acquired pressure ulcers were reduced by 19% with a consistent year over year improvement.<sup>1</sup> Beginning in 2006, STHS focused their efforts on standardizing clinical processes related to pressure ulcer assessment and nursing care. By focusing on process alone, pressure ulcer incidence was reduced 7.5%. However, when combining standardized clinical processes with bed technology, STHS dropped an additional 12.4% in their incidence rate of facility-acquired pressure ulcers.<sup>1</sup> Overall, FAPU incidence dropped from 225 in 2007 to 176 in 2009.

Facility-Acquired Pressure Ulcers: Rate of PU per 1000 patient days<sup>1</sup>

	Rate	2008	2009	2007-2009
STHS	0.6436	7.5%	12.4%	19.0%
Ascension Health	0.9162			
National <sup>4</sup>	32.000			

National Rate: HealthGrades Sixth Annual Patient Safety in American Hospitals Study, April 2009.<sup>4</sup>  
Note: PU prevention was standardized at STHS in 2006 (incorporates “SKIN+” Bundle)

12.4% decrease in FAPU using new surfaces with PU prevention bundle



### Ventilator Associated Pneumonia

Ventilator Associated Pneumonias also decreased over the study period. Overall there was a 92% reduction in ventilator associated pneumonia with a consistent improvement over the two year period in the 3 hospitals with ICU services.<sup>1</sup>

52.9% decrease in VAP with implementation of pulmonary protocol using TotalCare SpO<sub>2</sub>RT bed with pulmonary care

Ventilator Associated Pneumonia: Rate per 1000 ventilator days<sup>1</sup>

	Rate	2008	2009	2007-2009
STHS	0.2181	82.7%	52.9%	91.9%
Ascension Health	1.2950			
National <sup>5</sup>	3.7518			

Jonathan R. Edwards, et al, and the National Healthcare Safety Network Facilities. National Healthcare Safety Network (NHSN) Report. Data summary for 2006 through 2007, issued November 2008.<sup>5</sup>

Note: VAP Bundle was standardized at STHS in 2007

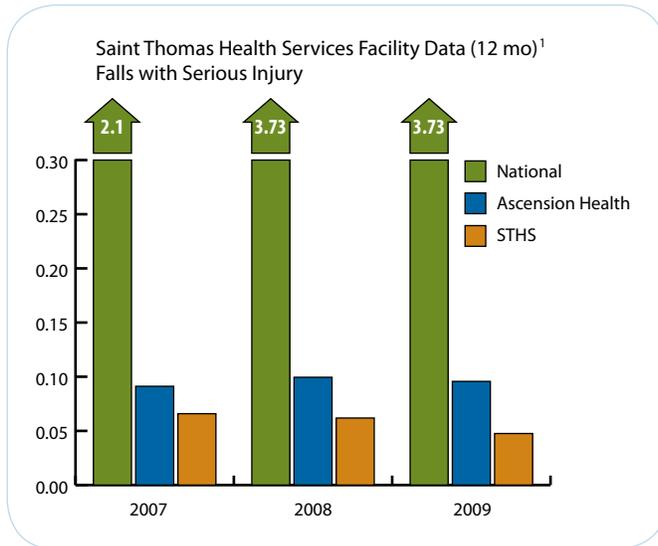
ICU Patient Days: 48,765 (The total number of days of care provided to patients during a 12-month period)

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Results continued



### Patient Falls

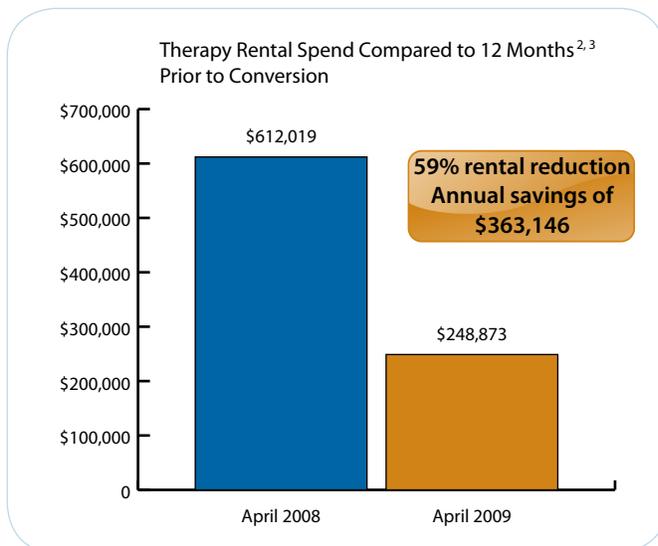
Patient Falls with Serious Injury was also a key measure in the analysis. STHS utilized the Hendrich II scale for falls risk assessment and the serious injury index as a part of their standardized process. The results showed an overall 27.7% decrease in patient falls with serious injuries since the process/technology implementation using Hill-Rom® technologies.<sup>1</sup>

Falls with Serious Injury: Rate per 1000 patient days<sup>1</sup>

	Rate	2008	2009	2007-2009
STHS	0.04676	6%	23.1%	27.7%
Ascension Health	0.0957			
National <sup>6</sup>	3.73			

Dunton, et al, Nurse Staffing and Patient Falls on Acute Care Hospital Units. Nurse Outlook, 2004.<sup>6</sup>  
Note: Falls Program was standardized at STHS in 2004 (Hendrich II Falls Risk Assessment)

**23.1% decrease in falls with serious injury since install/use of bed exit as part of falls prevention program**



### Rental Therapy Cost

Another important component of this clinical outcomes study was the financial improvements realized by a reduction in rental therapy costs for STHS. These results were significant as well. Rental days for the year prior to conversion to Hill-Rom® products accrued \$612,019 in annual costs.<sup>2</sup> Following the conversion to newly integrated therapeutic surfaces on all beds, an associated reduction in rental cost resulted. The rental spend was lowered to \$248,873 with associated annual savings of \$363,146 (59% reduction).<sup>3</sup>

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### Conclusions

A house-wide conversion of Hill-Rom bed systems, which included surface management for rental therapy as part of an overall clinical program to reduce preventable adverse events, resulted in improved clinical outcomes for Saint Thomas Health Services. This technology investment combined with the implementation of standardized clinical processes not only improved patient outcomes, but resulted in a significant reduction of rented therapeutic surfaces/frames. As STHS and Ascension Health continue their “journey to zero,” Hill-Rom has proven to be an important strategic partner.

#### Clinical Summary

I) PU reduction	19.0%
II) VAP reduction	91.9%
III) Falls reduction	27.7%

#### 2008 Case Mix Index

Baptist	1.6925
Middle Tennessee	1.3336
Saint Thomas	1.910

### References

#### STHS Data

- 1 Patients with Pressure Ulcers/VAP/Falls: Actual Priority for Action Statistics from Ascension Health (2007 vs. 2009) for these facilities.
- 2 2007 Rental Days: Based upon actual days used with known market per diem applied.
- 3 2009 Rental Days: Actual amount billed under the Hill-Rom rental therapy program for 4/1/08-3/31/09.

#### National benchmarks

- 4 *Pressure Ulcers: HealthGrades Sixth Annual Patient Safety in American Hospitals Study*. April 2009.
- 5 *Ventilator Associated Pneumonias*: Jonathan R. Edwards, et al, and the National Healthcare Safety network Facilities. [National healthcare safety network \(NHSN\) Report](#). Data Summary for 2006 through 2007, issued November 2008.
- 6 *Falls*: Dunton, et al, Nurse Staffing and Patient falls on Acute Care Hospital Units. [Nurse Outlook](#), 2004, 52:53-59.

### Acknowledgements:

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