Care Process Redesign

Why investing in hospital-acquired pressure injury prevention technology makes financial sense

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February 1, 2021 11:30 pm

Hospital-acquired pressure injuries (HAPIs) affect 2.5 million patients per year in the United States. With the cost of treating a single instance as high as $70,000, and because many payers, including Medicare and Medicaid, are not covering them, the business case for prevention is apparent.[a] HAPIs also are the second most common hospital lawsuit claim after wrongful death, claiming 60,000 patients each year, according to a study published by *Ostomy/Wound Management*.[b] Although the health-related complications associated with PIs are high, there have been no comprehensive assessments of PI costs, including both direct and indirect costs, on an individual hospital basis.

The Financial Case for Prioritizing Prevention

In the United States, PIs are scored by stage, and nearly half of all PIs can be categorized as late-stage (Stages 3, 4 or unstageable), according to the *Ostomy/Wound Management* study. Late-stage PIs take months or longer to heal and require additional resources to treat infectious complications. Some consequences that lead to additional cost include readmissions, increased lengths of stay (LOS) and clinical resources like antibiotics, diagnostic tests, procedures (e.g., debridement) and use of wound care disposables. In 2007, CMS estimated that each late-stage PI added $43,180 in costs to a hospital stay, while other estimates exceed $100,000.[c]

Hospitals also face financial burdens due to CMS regulations around HAPIs. They may receive no payment for incremental treatment costs of HAPIs, which CMS and many commercial health plans consider preventable. Hospitals with higher readmission rates and hospital acquired conditions (HACs), commonly seen in HAPI patients, are penalized by various CMS Quality Care Programs. Nearly 80% of hospitals receive some form of penalty.[d]

Modeling the cost of HAPIs

In order to fully address the risk of HAPIs, hospitals need to develop novel preventive solutions to augment current treatment approaches. To assess the cost effectiveness of any HAPI prevention or treatment protocol, an assessment of the financial impact of HAPIs on an individual hospital or hospital system is needed.

A model of the annual costs associated with HAPIs at the individual hospital level, using actual hospital characteristics, HAPI-related costs and outcome variables obtained from literature sources is evident in the exhibit below. Input variables included bed size, occupancy rate, high-risk beds, PI incidence and the incremental cost of late-stage HAPIs (See the exhibit for a complete list of model inputs used to calculate the figures below).

Base case model inputs

For the example base case analysis, the indicated values were set for each variable.

Model inputs	Value
Hospital size (# beds)	Medium: 344 beds
Occupancy rate (medium)	Medium: 65%
Pressure injury (PI) incidence rate	3.6%
Units adopted	100% of high-risk beds
PI reduction from high-risk beds	99%

High-risk patient %	40%
Readmission rate	22.6%
Stage 1 incidence % of Total PI	16.0%
Stage 2 incidence % of Total PI	38.0%
Late-stage incidence % of Total PI	46%
Unstageable incidence % of Total PI	7.0%
Stage 1 PI treatment cost per case	$2,000
Stage 2 PI treatment cost per case	$8,000
Late-stage PI treatment cost per case	$18,000

The potential budgetary impact due to reduction of HAPI incidence rates at a medium-sized hospital archetype (based on CDC benchmarks) of 344 beds was evaluated using this model. For this analysis, occupancy rate was fixed at 65% and the average initial PI incidence was set at 3.6%.[e]

In the base case scenario, this medium-sized hospital would experience 644 HAPIs and 146 readmissions within 30 days due to HAPIs each year, with estimated costs totaling $10.4 million annually. Leaving all other variables constant, a 50% reduction in the HAPI rate would result in a potential savings of over $5 million. That level of reduction (322 HAPIs) is equivalent to preventing less than one HAPI per day on average. Therefore, even a small reduction in daily HAPI incidence can substantially impact a hospital's costs, improve patient outcomes and reduce LOS for these patients, creating additional capacity for additional inpatient cases and revenue.

Notably, these hypothetical reductions do not consider potential CMS penalties that may be reduced by a decreased HAPI rate, but it is clear that reducing HAPIs can greatly increase an institution's chance of avoiding such penalties. Also, newer measures such as days institutionalized or days in the community or lost workdays would be dramatically impacted by improvements in dealing with HAPIs.

Conclusion

Poor clinical outcomes for patients and a substantial financial burden for U.S. hospitals are the concerns related to HAPIs. Hospital leaders should evaluate the costs associated with HAPIs and examine the savings possible through HAPI-specific prevention efforts.

The authors thank Fabian D'Souza, MD; Dushon Riley, PhD; Jeffrey Skaar, PhD; Matharishwan (Matha) Naganbabu, PhD and Nicholas Bettencourt for their support in developing the budget impact model for HAPIs and assistance with this manuscript. All of these individuals were with Boston Strategic Partners Inc., Boston, when the budget impact model and manuscript were being developed.

Footnotes

[a] "By the Numbers: CHPSO Pressure Injury Data," Aug. 4, 2017.

[b] Bauer, K., Rock, K., Nazzal, M., Jones, O., Qu, W., "Pressure Ulcers in the United States' Inpatient Population From 2008 to 2012: Results of a Retrospective Nationwide Study," *Ostomy Wound Management,* November 2016.

[c] CMS Medicare program: changes to the hospital inpatient prospective payment systems and fiscal year 2009 rates; payments for graduate medical education in certain emergency situations; changes to disclosure of physician ownership in hospitals and physician self-referral rules; updates to the long-term care prospective payment system; updates to certain IPPS-excluded hospitals; and collection of information regarding financial relationships between hospitals. Final rules. *Federal Register*, August 19, 2008, pp.48433-49084; and Brem, H., Maggi, J., Nierman, D., et al., "High cost of stage IV pressure ulcers," *American Journal of Surgery,* Oct. 1, 2010.

[d] Rau, J., "Medicare eases readmission penalties against safety-net hospitals," *Kaiser Health News*, Sept. 26, 2018.

[e] Bergquist-Beringer, S., Dong, L., He, J., Dunton, N., "Pressure ulcers and prevention among acute care hospitals in the United States," *Joint Commission Journal on Quality and Patient Safety,* September 2013.

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