

Showcasing ROI Makes a Business Case For Infection Prevention

Although infection prevention and control (IPC) is essential to a facility's success, these programs have traditionally been targets of facility budget cuts due to financial constraints. While the pandemic heightened a focus on the importance of IPC, infection preventionists must continue to demonstrate to C-suite executives that IPC improves patient/staff safety and generates a positive return on investment (ROI).

Current Forces Driving HAI Economics

Each year, the [Centers for Disease Control and Prevention \(CDC\)](#) estimates that close to 2 million people contract hospital-associated infections (HAIs), and approximately 100,000 deaths occur as a result of HAIs. Breaking down [extra costs of HAIs per patient](#), depending on HAIs contracted, can run a facility approximately \$1,000 to \$50,000 compared to a patient without a HAI and cost a facility roughly \$25,000 *per incident*.



The [estimated direct medical cost of HAIs](#) is around \$10 billion annually. However, when cost-shifting is accounted for, HAIs may cost closer to between \$35 and \$45 billion each year for acute care. Overall, the [annual total direct, indirect and nonmedical social costs](#) of HAIs are estimated at \$96 billion to \$147 billion annually, and the [CDC](#) estimates a \$45 billion annual direct cost of HAIs could be reduced by as much as \$31.5 billion with quality infection prevention and control programs.

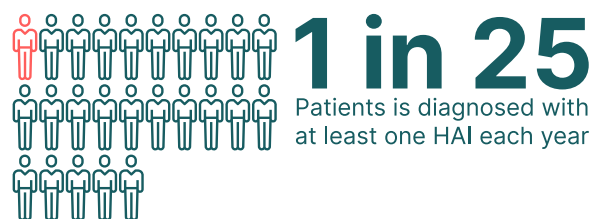
Key to a successful business case for IPC programs is understanding the current forces

driving healthcare economics. The [Centers for Medicare and Medicaid Services](#) no longer provides additional payments for certain hospital cases with secondary diagnoses when the condition was not present on admission. Additionally, under the Patient Protection and Affordable Care Act, CMS [can penalize hospitals](#) for high HAIs by tying reimbursements to circumstances such as hospital readmissions, mortality rates and patient satisfaction scores. Hospitals can also be disciplined for improper reporting or failing to report to CMS' Inpatient Quality Reporting Services.

These driving forces directly impact a hospital's bottom line as the lowest-performing 25% of facilities lose 1% of Medicare payments. Under [Medicare's Hospital-Acquired Condition \(HAC\) Reduction Program](#), almost 2,000 hospitals have been penalized with 1,360 hospitals disciplined at least twice and 77 hospitals penalized each year since the program's 2014 inception. In February 2021, CMS announced that [774 hospitals will face Medicare payment cuts](#) in fiscal year (FY) 2021.

Direct and Indirect Costs Associated with HAI

The CDC reports that [1 out of every 25 patients](#) is diagnosed with at least one HAI each year related to hospital care, and further infections occur in other healthcare settings. In addition to the toll on human lives, these infections also represent a heavy financial burden for hospitals. Facilities must now pay in excess [tens of thousands of dollars of care related to each HAI](#). As a result of these infections, there are also [long-term financial consequences](#) such as negative publicity, the risk of a facility's accreditation status and loss of market share that facilities must also consider.



It's imperative that C-suite leaders recognize the real value of their IPC programs, as financial costs from HAIs are both direct and indirect. With the federal government no longer reimbursing hospitals for the extra costs for preventable infections, hospitals are responsible for the high costs of care associated with each HAI, including:

- Penalties, fines, lawsuits and malpractice claims
- Diminished facility reputation resulting in fewer patients and lower revenue
- Higher costs from increased length-of-stay
- Staff (safety, turnover) and excess costs for IPC products
- Patient inability to pay given a higher financial burden and even bankruptcy for patients resulting a patient's diminished quality of life (e.g., permanent disability, lost wages)

Aside from the direct and indirect costs of HAIs, hospitals must decrease patient length of stay

(LOS) and instead take on new patients for those beds. This increases a hospital's overall patient volume, revenue and reimbursement. By [demonstrating these](#) improvements to hospital leadership, infection preventionists showcase a positive value and ROI made from investing in IPC best practices.

Infection Prevention: ROI Case Study Example

In 2007, the [Pennsylvania Health Care Cost Containment Council](#) reported hospital charges of just over \$35,000 in cases without a HAI to just over \$190,000 in cases with a HAI. HAI cases cost 5.5 times more than cases without a HAI and resulted in 15.3 days more length-of-stay. Hospitals statewide only paid approximately 27% of established charges due to HAIs. Effective IPC programs dropped the HAI infection rate nearly 8% from 2006 to 2007 (a reduction of 2,000 patients contracting a HAI).

Table. Pennsylvania Healthcare Cost Containment Council Hospital-Acquired Infections, 2007 Report Highlights

2007 Cases	Number of Case*	Infection Rate Per 1,000 Cases*	Mortality		Average Length of Stay (In Days)		Average	Charge
			Number	Percent	Mean	Median	Mean	Median
Number	1,578,600	17.7	35,120	2.2%	4.7	3.0	\$37,943	\$20,111
Cases with a hospital-acquired infection	27,949	N/A	3,416	12.2	19.7	15.0	\$191,872	\$87,655
Cases without a hospital-acquired infection	1,550,651	N/A	31,704	2.0	4.4	3.0	\$35,168	\$19,748

*The number of cases with infections represents the number of hospitalizations in which the patient contracted a hospital-acquired infection as identified and reported by the hospital.

Source: Pennsylvania Health Care Cost Containment Council (PHC4). Hospital-acquired infections in Pennsylvania in 2007 [online]. 2009 Jan [cited 2010 Apr 21]. Available from Internet: <http://www.phc4.org/reports/hai/07/default.htm>.

This case has compelling evidence that when a hospital improves its IPC program, it can have positive effects on the bottom line and improve patient safety and satisfaction.

excess costs due to HAIs and increased LOS due to HAI from multiple reports. These infections increase average hospital LOS by **9-15 days** and average hospital costs by **\$25,000** (in 2020 dollars).

The table below shows average HAIs, expected

	Expected HAI Acute Infection Rate (1)	Expected HAI Acute Excess Cost Per HAI (1)	Expected Acute Excess LOS Per HAI (1)	Study 1 Excess HAI Cost (3)	Study 2 Excess HAI Cost (4)	Study 3 Excess HAI Cost (5)	Study 3 Excess HAI LOS (5)	Study 4 Excess HAI LOS (6)	Study 5 Excess HAI LOS (7)
SSI	0.22%	\$29,276	8.1	\$28,612	\$13,300	\$20,800	11.2		
VAP	5.51%	\$27,393	14.9	\$11,165	\$31,900	\$40,000	13.1		
CLABSI	0.10%	\$32,199	16.6	\$40,814	\$30,000	\$45,800	10.4		
MRSA	1.58%	\$6,248	4.5	N/A	N/A				
C. Difficile	1.37%	\$10,577	6.7	N/A	N/A	\$11,000	3.3		
UTI	6.68%	\$5,904	4.1	\$1,127	\$1,100	\$1,000	N/A		
Average		\$25,000 (2)	9.2					8.6	15.3

There is a surcharge of \$1,100 per patient admitted to the hospital in taking into account total costs and averaging them across the hospital and each patient—regardless of whether or not they have a HAI. For patients that also contract MRSA, excess HAI costs and LOS significantly increase. A patient who has a SSI and MRSA costs a hospital over \$40,000 more than a patient without a HAI, and one with comorbid CLABSI and MRSA almost \$60,000 extra. This is due to increasing LOS; for SSI patients, an extra 23 days and CLABSI patients almost 16 extra days.

- (1) [APIC](#)
- (2) [Graves](#)
- (3) [Scott 2009](#)
- (4) [Anderson 2007](#)
- (5) [White 2007](#)
- (6) [Roberts 2010](#)
- (7) [Pennsylvania 2007](#)

Each Dollar Invested in IPC Generates Over \$3.00 of Savings

In one [five-year study from the Ottawa Hospital](#), an analysis was conducted to compare the investment in its surgical site infection (SSI) prevention programs to the savings from averted SSI cases. Within that timespan, 2010-2016, Ottawa Hospital invested over \$600,000 in surgical quality improvement programs targeting SSI incidence.

As a result, Ottawa Hospital accrued over \$1.4 million in cumulative savings from averted SSI cases—a return of just over **\$3.00 per dollar invested**.

The Johns Hopkins Hospital [conducted a 2004 study](#) on the effects of an IPC program on central line-associated bloodstream infections (CLABSI). The [study's findings](#) concluded that implementing simple and inexpensive interventions averted over 40 CLABSIs and eight deaths and saved the hospital **nearly \$2 million in extra costs**. As the study did not identify the annual hospital IPC cost, ROI could not be calculated.

Below are several case studies which measure HAI costs and indicate potential savings if effective IPC programs were implemented:

1. A [2007 study](#) conducted in 28 hospitals in the Southeast U.S. estimated the cost of HAIs within the group of hospitals and then compared them to the entire network.
 - a. The median annual cost of HAIs per hospital was almost \$600,000.
 - b. The total annual cost of HAIs for the 28 hospitals was over \$26 million.
 - c. Each hospital budgeted a median of just under \$130,000 for IPC programs.
 - d. The median annual cost of HAIs was almost five times the amount budgeted for infection control.

By reducing HAIs 25% each year, each hospital

could save a median of close to \$150,000 (pays for IPC program cost) and could save the hospitals over \$6.5 million.

2. Allegheny General Hospital in Pennsylvania performed a [three-year study](#) to examine hospital revenues and expenses of CLABSIs in 54 patient cases in two intensive care units (ICUs).
 - a. The average payment for a case complicated by CLABSI was almost \$65,000.
 - b. The average expense was close to \$92,000 and a total operating loss of nearly \$1.5 million.
3. St. Christopher's Hospital for Children in Philadelphia [achieved the following outcomes](#):
 - a. By Implemented a modified neonatal ventilator care bundle, the hospital decreased the ventilator-associated pneumonia (VAP) rate in its neonatal ICU from 3.9 (10 cases) per 1,000 ventilator days in 2006 to 0.3 (1 case) per 1,000 ventilator days.
 - b. Based on [CDC estimates](#) of the cost of one VAP case to be \$28,508 (in 2005 dollars), St. Christopher's Hospital for Children saved approximately \$130,000 per 1,000 ventilator days (adjusted to 2020 dollars).
4. In 2010, [a random sample of 1,253 hospitalized, high-risk adults](#) were selected to measure such factors as total and variable medical costs, LOS, HAI site, APACHE III score, antimicrobial resistance and mortality. This study indicates that HAIs double hospital costs:
 - a. 159 patients (12.7%) developed a HAI.
 - b. Total costs ranged between \$9,310 to \$21,013, variable costs were \$1,581 to \$6,824, LOS was 5.9 to 9.6 days, and attributable mortality was 6.1%.
 - c. Total costs for 159 patients with HAIs were about \$2.4 million in medical costs and approximately \$5.3 million for premature death.
 - d. Excess LOS was about 1,100 days.

Making A Business Case for IPC ROI

Many HAIs are now considered to be preventable when facilities and staff follow strict adherence to evidence-based best practices. COVID-19 also highlighted how IPC programs will continue to play a larger role in protecting hospitals against future liabilities due to HAIs with proactive infection prevention and control programs. IPC programs now have an increased role in protecting hospitals against future liabilities.

A 2008 survey of IPC challenges on the topic of maintaining a quality IPC program reported the following (930 respondents):

- 30 percent suggested that executives and physicians are their most important resources to meet HAI challenges.
- Only 50% of that number indicated that these executives and physicians were leading the charge against infections in their facilities.
- 57 percent cited regular IPC agenda discussion at board meetings.
 - Only 15% said leadership provided feedback and recommendations.
- Survey respondents also indicated challenges in:
 - Engaging information technology support, measuring compliance, providing adequate staffing, removing indwelling urinary catheters, ensuring appropriate physician medical record documentation and having sufficient time for surveillance investigation.

Effective IPC programs can save healthcare institutions more money than it costs to fund the program. Therefore, demonstrating value and return is crucial as healthcare executives must support many initiatives with limited resources.

IPC Programs: Valuable ROI

While facilities have made great strides in reducing HAIs, these infection incidences are still too high. Their overall costs must remain top-of-mind to hospital executives, since as the CDC projects that effective IPC programs and control measures can prevent up to 70% of HAIs. When there is executive buy-in and implementation, the investment and ROI for IPC is real and tangible.

An IPC program in a 250-bed community hospital typically runs about \$350,000 a year, which is less than the cost of 10 bloodstream infections. Aside from educational costs, training and supplies, this investment typically covers two professional infection preventionists; one administrative support staff member; and half of a full-time-equivalent medical director—all of whom could support other hospital departments.



Infection prevention can pay dividends, though its success requires a top-down approach. Hospital executives must allocate resources, set clear expectations, and commit to IPC implementation and continuous improvement and not rely on the status quo. Results clearly show not just on the hospital's balance sheet, but where it matters most—patient safety and lives saved.

How nodMD Can Support Your Facility with IPC

For organizations with inadequate resources or expertise to implement comprehensive and cost-effective infection prevention and control programs, nodMD can help. In fact, the savings nodMD generates can more than offset the cost of its services as many infection prevention practices can improve quality without much of a financial investment.

nodMD's [subject matter IPC experts](#) support infection prevention and control teams seeking maximum cost reductions and improved patient and healthcare worker safety.

Please contact nodMD for a FREE, NO OBLIGATION phone consultation by emailing our board-certified infection preventionists at yourfriends@nodMD.com or by calling (773) 383-1743.

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