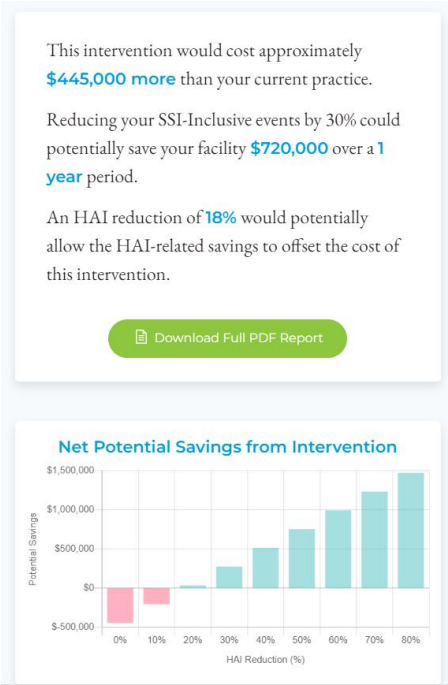
Intervention Cost Calculator Report: SSI-Inclusive

Healthcare-associated infections can be reduced through intervention events. The additonal costs associated with interventions can potentially be offset by HAI-related savings.



PROPOSED INTERVENTION: Aerobiotix Sample

During a 1 year period, our facility had 100 SSI-Inclusive events. The intent of this intervention is to reduce those infections by 30%.

Costs

- Estimated cost of implementing over a 1 year period: $445,000
  - This estimate is based on:
    - A cost of $89 per intervention event
    - 1 intervention events per patient-day or device-day
    - A one-time additional cost of $0
- Estimated cost of current practice over a 1 year period: $0
  - This estimate is based on a cost of $0 per intervention event.
- Difference between current practice and the proposed intervention: $445,000

Savings

- Estimated savings from a 30% reduction in SSI-Inclusive events: $720,000
  - Estimated reduction needed to offset the cost of the intervention: 18%
  - These estimates are based on an attributable cost of $24,000 per SSI-Inclusive.

Intervention Cost Calculator: Methodology & Limitations

PURPOSE

This report provides:

- The cost of the current practice
- The cost of the new practice, and
- How often the event of interest is occurring in your facility (e.g., how often a specific product is used).

This output can optionally be combined with output from other calculators on this site to emphasize the expected benefit of the intervention.

LIMITATIONS

- This tool focuses on the cost that is incurred each time the new product or process is used (e.g., use of a new skin prep with each surgical patient). It does not take into account other costs like those associated with training staff about the intervention or changes in productivity of the healthcare delivery team.
- This tool is intended for interventions that involve a new product or process that is used multiple times (e.g., use of a new skin prep with each surgical patient). It is not intended for use with interventions that only involve a one-time cost (e.g., purchasing new sterilizers).
- The estimates provided by this tool assume that the denominator remains relatively constant from the pre-intervention time period to the post-intervention time period (e.g., there are equal numbers of device-days during the two time periods).

METHODOLOGY

- The tool guides the user through the exercise of estimating the cost of an intervention, accounts for the deferred cost of replacing an existing practice when applicable, includes a one-time cost if applicable.
- When the tool is used by itself, it assesses cost-benefit by comparing the estimated cost with the cost avoidance. The user provides the estimated cost per HAI that they want to use and can reference AHRQ estimates if they lack facility-specific data [1].
- When the tool is used in conjunction with the MAT or DART calculators it assesses cost-benefit be comparing the estimated cost with the cost avoidance calculated in those additional tools.

EXPLANATION OF OUTPUT

See the Intervention Cost Calculator (ICC) tool sample report at https://haitools.apic.org/Sample_ICC_Report.pdf. In this hypothetical example, the proposed intervention is a switch from scrubbing the hub with alcohol pads to using alcohol disinfection caps that remain on the hub when not being accessed.

The estimated cost of implementing the intervention over 12 months ($92,578) was calculated by multiplying the per-use cost of the alcohol caps ($0.20) by the estimated number of intervention events (8.4 events per central line-day multiplied by 55,106 central line-days) and adding the one-time additional cost ($0).

The estimated cost of the current practice over 12 months ($9,257) was calculated by multiplying the per-use cost of the alcohol wipes ($0.02) by the estimated number of intervention events (8.4 events per central line-day multiplied by 55,106 central line-days).

The difference between current practice and the proposed intervention was calculated by subtracting the cost of the current practice from the cost of the proposed intervention.

The estimated savings from the 5% reduction ($132,000) was calculated by multiplying the cost per CLABSI ($48,000) by the number of prevented CLABSIs (55 CLABSIs multiplied by 0.05).

Dividing the additional cost of the intervention ($83,320) by the attributable cost of all the CLABSIs (55 CLABSIs multiplied by $48,000) reveals a required CLABSI reduction of 3% for cost neutralization. In other words, if the intervention results in a 3% (or greater) reduction in CLABSIs, the cost of the intervention is potentially offset.

When combined with DART data, the attributable cost of the HAI is not incorporated. Instead, this tool compares the total intervention cost to the payment that could potentially be received by performing additional procedures.

When combined with MAT data, the attributable cost of the HAI is not incorporated. Instead, this tool uses the total intervention cost and the estimated number of lives saved to provide an estimated cost per life saved.

REFERENCES

1. Estimating the additional hospital inpatient cost and mortality associated with selected hospital-acquired conditions. Content last reviewed November 2017. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/hai/pfp/haccost2017-results.html

Deferred Admissions and Reimbursement Report: SSI-Inclusive

During a 1 year period of time, our facility had 20 SSI-Inclusive events.

- These events caused an estimated 224 additional patient-days of hospitalization.
  - This estimate is based on each SSI-Inclusive resulting in 11.2 additional days of hospitalization.
- Over a 1 year period, a sustained 40% reduction in SSI-Inclusive could result in:
  - 8 fewer SSI-Inclusive events
  - 89 fewer patient-days of hospitalization

WHAT COULD BE DONE WITH 89 EXTRA PATIENT DAYS?

37 Total Knee or Hip Arthroplasty procedures

30 Lumbar Fusion procedures

PROCEDURE	ESTIMATED LENGTH OF STAY	ESTIMATE POSSIBLE # OF PROCEDURES WITH 89 DAYS	REIMBURSEMENT PER PROCEDURE	TOTAL POSSIBLE REIMBURSEMENT
Total Knee or Hip Arthroplasty	2.4	37	$11,837	$437,969
Lumbar Fusion	2.9	30	$2,458	$73,740

How can a reduction in SSI-Inclusive events be achieved?

PROPOSED INTERVENTION: Aerobiotix Sample

Costs

- Estimated cost of implementing this intervention over a 1 year period: $99,000
  - This estimate is based on:
    - A cost of $99 per intervention event
    - 1 intervention event per patient
    - A one-time additional cost of $0
- Estimated cost of current practice over a 1 year period: $0
  - This estimate is based on a cost of $0 per intervention event.
- Difference between current practice and the proposed intervention: $99,000

Savings

- Estimated reduction in SSI-Inclusive events needed to offset the cost of the intervention through additional Total Knee or Hip Arthroplasty procedures: 8%

Deferred Admissions and Reimbursement Tool: Methodology & Limitations

PURPOSE

This report provides:

- An estimate of how many additional patients could potentially be admitted for various procedures based on a reduction in the number of extra days that beds are filled by Healthcare Associated Infection (HAI) patients,
- An estimate of how much reimbursement those additional patients' procedures are potentially worth, and
- The option to add information about an intervention that could help achieve an applicable HAI reduction

LIMITATIONS

- This assessment is not applicable to facilities that have sufficient bed availability. If your facility isn't deferring admissions because of high bed occupancy issues, this isn't the right tool to use.
- The list of revenue generating admissions that you can select from may not include procedures performed at your facility.
- The beds opened up by reducing infection events may not be applicable to the revenue generating admissions you select. For example, if CLABSIs are reduced by 20% but most of those are in the neonatal intensive care unit, this does not necessarily mean that the facility will have the capability to perform more pacemaker insertions.
- The potential revenue from deferred admissions are calculated using average reimbursements based on the Inpatient Utilization and Payment national summary data from Centers for Medicare & Medicaid Services (CMS) and are not actual reimbursements. See the Deferred Admissions and Reimbursement Tool (DART) methodology section for more information.
- This assessment assumes that the applicable denominator (e.g., patient-days, central line-days) will remain approximately constant.
- These estimates are based on aggregates, and individual patient events may differ significantly.

METHODOLOGY

- The estimates utilized are based on the most recent available, multi-Institutional, peer-reviewed publications in reputable journals and the most recently available CMS data.
  - The attributable length of stay estimates of HAIs were derived from one of two sources. For all Hospital Acquired Conditions (HAC) the additional days came from a November 2018 publication of healthcare associated infections from a network of 43 hospitals across the United States.[1] For ventilator associated pneumonia and all surgical site infections (not just HAC procedures) the attributable days were derived from a 2013 JAMA meta-analysis of studies published between 1986 and 2013.[2]
  - The number of potential (yet deferred admissions) as well as the CMS and total payments for said admissions were derived from the most recently available (FY2016) National Summary of Inpatient Charge Data by Medicare Severity Diagnosis Related Group as published by CMS.[3] These estimates, specifically the payment information, are likely conservative in that private insurers may reimburse for the same procedure at a higher rate.

EXPLANATION OF OUTPUT

See the sample results of the tool at http://haitools.apic.org/Sample_DART_Report.pdf In this hypothetical example, the Solid Organ Transplant Division would like to expand their kidney transplant program, but the post-operative units had 12 Clostridioides difficile infection (CDI) cases over 1 quarter. A 50% reduction in CDI, which would be six fewer cases, would potentially make an estimated 38 bed-days available. Using a Length of Stay (LOS)* of 5.5 days per kidney transplant allows for 6 additional kidney transplants with an opportunity cost estimate of a CMS payment of $156,122.

When presenting the results of this analysis, it is important to note that payment for potential admissions is not the same as organizational revenue. Obviously, an extra total joint replacement is not cost-free, but one can reasonably argue that it is certainly better than receiving no additional reimbursement because the higher-level Diagnostic Related Grouping (DRG) is the result of a non-reimbursable HAI event. These estimates of LOS and CMS are conservative but should be readily understood by audiences familiar with CMS, billing, and reimbursement. The estimates for attributable length of stay for the HAIs are largely contemporary and rooted in multi-facility analyses but are certainly subject to interpretation and scrutiny.

* The LOS used by this tool is the geometric mean length of stay (GMLOS) provided by CMS.

REFERENCES

1. Kast R, Grabow C, Fitch M, Tobar S, Malani A, Olmsted R. Financial cost, length of stay, and patient experience associated with healthcare-associated infections across a 43 hospital network. Open Forum Infectious Disease 2018;5(suppl_1):S644-5. https://doi.org/10.1093/ofid/ofy210.1839
2. Zimlichman E, Hendersen D, Tamir O. Health care-associated infections: a meta-analysis of costs and financial impact on the US health care system. JAMA Intern Med 2013;173(22):2039-46. https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/1733452
3. Data.CMS.gov. National summary of inpatient charge data by Medicare Severity Diagnosis Related Group (MS-DRG), FY2016. https://data.cms.gov/Medicare-Inpatient/National-Summary-of-Inpatient-Charge-Data-by-Medic/us23-4mx2/data