



BOOSTing Care Transitions

Project BOOST: A Return On Investment Analysis

Reducing Hospital Readmissions: Who benefits? Who pays?

The US Department of Health and Human Services (DHHS) put a spotlight on hospital readmissions by requiring hospitals to report 30-day readmission rates as a quality metric in June of 2009. Medicare, with intent to stem soaring healthcare costs, plans a payment policy change that will penalize hospitals with high readmission rates. The recently passed health care legislation includes language supporting such changes and also provides funds for quality improvement efforts to reduce rehospitalizations. Preventable hospital readmissions harm patients and generate waste in the healthcare system. The goal of Project BOOST (Better Outcomes for Older adults through Safe Transitions) is to enhance patient safety as patients transition from the hospital to home. By improving the discharge processes, Project BOOST aims to:

- Reduce 30-day readmission rates for hospitalized patients (with particular focus on older adults)
- Improve patient satisfaction scores, especially those related to hospital discharge
- Improve flow of information between hospital and outpatient physicians
- Ensure patients at high risk of readmission are identified and specific interventions are offered to mitigate their risk
- Improve patient and family education practices to encourage use of the TeachBack process around risk specific issues related to discharge

The ROI for doing the right thing

Hospitals interested in improving patient care quality and safety should naturally be eager to take on quality improvement (QI) initiatives to improve the discharge process. However, in the healthcare payer model that exists today, financial incentives reward hospitals for readmissions, and efforts to reduce them appear to incur financial losses—most Chief Financial Officers (CFO) and CEOs thus question such initiatives. Currently, but likely not in the future, payers (Medicare or private insurance) reimburse readmission cases just like new patient admission cases. Although successfully reducing preventable readmissions benefits the healthcare system by reducing overall cost of delivery, it may actually hurt hospitals by lowering their revenues.

Notable exceptions to this are hospitals that are part of an Accountable Care Organization (ACO). In an ACO, the provider and payer function as one (e.g. Geisinger Health System). Therefore reducing unnecessary readmissions is of immediate financial benefit to the ACO.

For the majority of hospitals facing financial pressures in the current economy, it can be very difficult for a hospital CFO to sign off on a QI project that requires incremental investment and reduces revenues, *even if it improves patient quality.*

In addition to the evolving financial pressures from payors to reduce readmissions, a deeper look at all the benefits of reducing readmissions, including primary and secondary effects of Project BOOST, can reveal even more revenue replacement opportunities. Tapping into these opportunities can, not only reduce the previous revenue losses due to readmissions reduction, but also potentially lead to a revenue-neutral or revenue-positive business case for the hospital.

Taking A Deeper Look

In analyzing the Return On Investment (ROI) for any QI project, it is important to consider all financial contributors including those due to secondary effects. Doing so can provide a more complete and accurate view of the financial impact of the project. It can even reveal hidden opportunities that can improve the financials of the project.

The goal of Project BOOST is to reduce 30-day readmission rates for general medicine patients. Reduction of readmissions is the primary effect of the interventions. In doing so, it also frees up bed capacity (that was being used by readmitted patients). This is a secondary effect of the QI intervention and one that creates financial opportunity for the hospital as it could fill this new capacity with patients who may have higher margins (e.g. surgery or newly insured patients with medical issues).

Furthermore, if the hospital is operating at capacity, it is likely that the hospital is experiencing emergency department overcrowding issues and increased patient wait times causing patients to leave without being seen (LWBS). By reducing readmissions and freeing up bed capacity in target units, Project BOOST could lead to upstream positive effects for the ED. It can reduce the number of patients coming back to the ED within 30-days and reduce wait times in the ED as there will be more free capacity in the target units to accept patients from the ED.

The table below lists primary and secondary effects of Project BOOST that have the potential to positively or negatively impact the financials of the project. Red and green check marks indicate a negative and positive impact to the financials respectively. Contributors checked in the "Hard \$" column are those that can be easily quantified into real revenue or cost dollars. Soft contributors (checked in the "Soft \$" column), though real, cannot easily be translated to a dollar value. Although soft contributors such as improved patient satisfaction and safety are difficult to build into a financial model, it is important to highlight these outcomes, as they are typically aligned with the strategic priorities for hospitals & executives.

Likely future penalties for hospital readmissions deemed preventable might result in decreased hospital reimbursement. In terms of pay for performance (P4P) contracts between hospitals and payers, Project BOOST may have a beneficial effect on metrics specified in the contracts - including readmissions, patient satisfaction, measures of safety culture and teamwork - which represent "Hard \$."

Financial Impacts of Project BOOST

Primary effects due to BOOST interventions	Hard \$	Soft \$
BOOST QI initiative investment	✓	
Readmission revenue loss (due to reduction of readmissions)	✓	
For ACO only - Cost savings due to reduced readmissions	✓	
Medicare reimbursement penalty avoidance (FUTURE)	✓	
Patient care quality improvement		✓
Hospital ratings improvement		✓
Secondary effects due to BOOST interventions	Hard \$	Soft \$
Bed capacity improvement (replacement opportunity)	✓	
ED capacity improvement (reduction of patients leaving without being seen)	✓	
P4P reimbursement increase (due to care transitions improvement)	✓	
Patient satisfaction improvement		✓
Increased staff satisfaction & Reduced staff turnover		✓
Reduced adverse drug events		✓
Reduced medical malpractice costs		✓

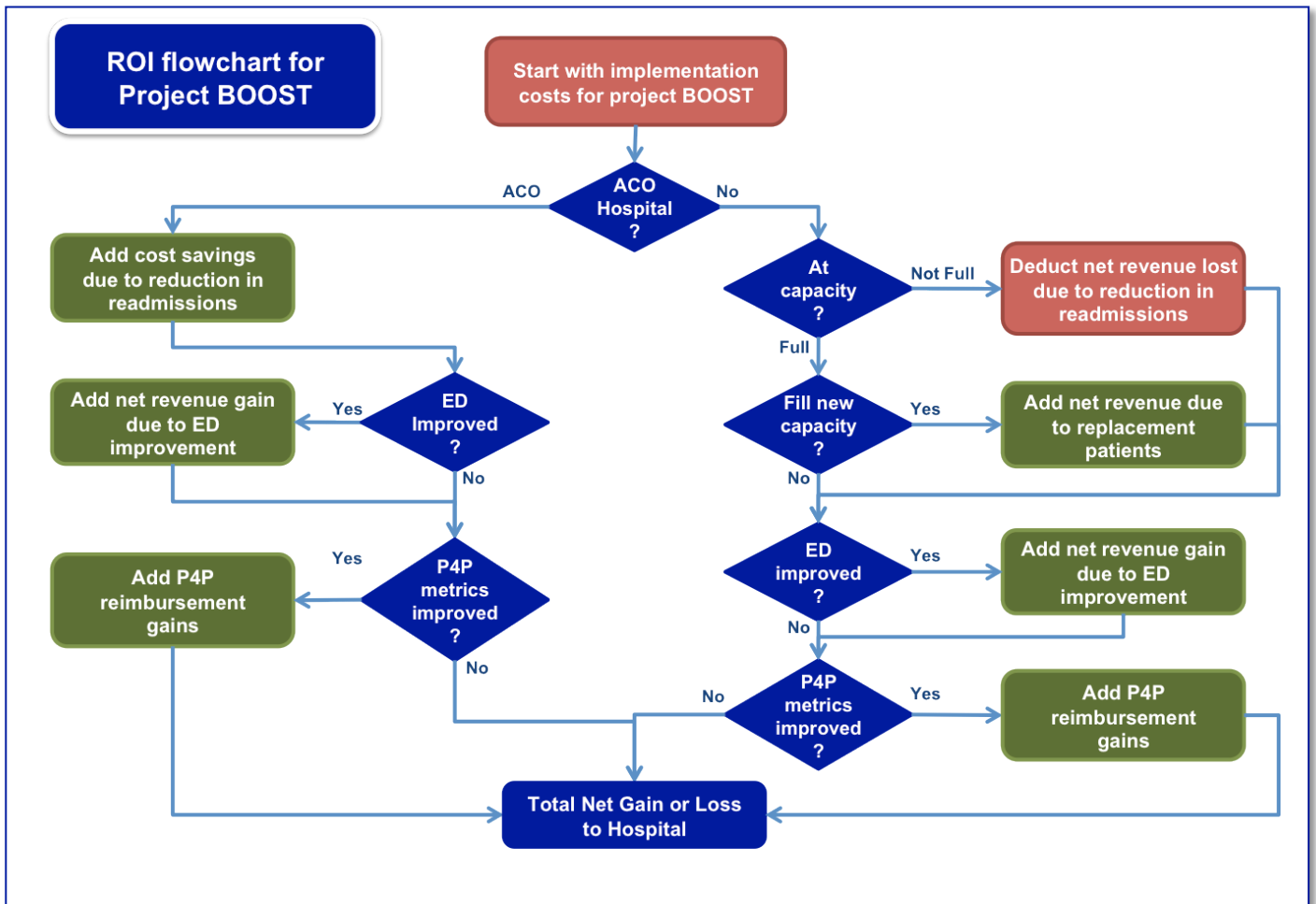
Modeling Return On Investment For Project BOOST

Project BOOST has built a simple ROI calculator, by taking into account the hospital data, existing conditions, and actual or expected results from project BOOST. Based on the existing conditions at the hospital, the calculator can add or deduct the appropriate financial contributors from the overall ROI. The algorithm for this calculator is shown in the flowchart below. The calculator is available as part of the BOOST tools in the form of an Excel spreadsheet that can be downloaded from the BOOST website.

The BOOST ROI calculator takes into account conditions such as whether the hospital is part of a closed system (ACO) or not (on traditional DRG based payments), whether the hospital is operating at capacity or not, whether the emergency department (ED) suffers from patients leaving without being seen (LWBS) issues and whether the hospital qualifies for P4P reimbursements.

The calculator, at present, does not take into account soft contributors such as patient satisfaction, hospital ratings improvement etc. It also does not account for the impending Medicare payment policy changes that can penalize hospitals for poor 30-day

readmission rates. In the future, project BOOST can help avoid these penalties and further improve the financials of the hospital.



A snapshot of the BOOST ROI calculator (that implements the above algorithm) is shown below. The user is required to enter information specific to their hospital and the hospital units targeted for BOOST implementation into the **light green-colored user-cells** down the middle of the calculator. Upon opening the calculator, the user will see values already entered in the light green-colored user-cells, which are simply for illustration purposes. To the right of the user-cells are hints to help the user.

The user-cell entries include quantitative information such as hospital size, average net revenues, costs, rate of readmissions and expected results. Financial data entries (revenue, costs etc) can be obtained from the finance department of the hospital. Some entries ("Yes/No") are used to implement the "decision diamonds" shown in the algorithm flowchart above. The user is also expected to enter the expected or actual investment (cost) to implement the BOOST initiative and outcome in terms of percentage reduction in readmissions.

The goal of Project BOOST (Better Outcomes for Older adults through Safe Transitions) is to improve the care of patients as they transition from the hospital to home. By improving the discharge process, Project BOOST aims to reduce 30-day readmission rates for general medicine patients. This BOOST Return On Investment (ROI) calculator will help you understand the financial impact of reducing readmissions on your hospital. Enter information specific to your hospital in the cyan colored cells below to immediately see the potential impact of reducing readmissions through BOOST implementation at your hospital.

Hospital Data		Hints
Number of annual inpatient discharges on target BOOST unit(s)	5000	This number is expected to be impacted by the BOOST intervention due to reduction in readmissions.
Average net revenue per discharge on target BOOST unit (\$)	\$500	Average net revenue = (Average revenue per discharge - Costs) You may get this figure from your finance department.
Current rate of 30-day readmissions (%) on target BOOST unit	20%	Typical readmission rates can range between 0-30%.
Reduction in 30-day readmissions achieved or expected after BOOST implementation (%)	25%	Dedhia et. al.[1] showed a 36% (relative) reduction with BOOST-like interventions. You might want to be more conservative based on your hospital's current 30-day readmission rate & discharge process.
Is the target unit(s) operating at capacity?	Yes	Select Yes if the unit is operating at capacity.
Reduction of readmissions will result in spare capacity. How much of this capacity do you expect to backfill with new patients. (%)	100%	If your hospital unit was operating at capacity (i.e. full), it is likely that you will fill the new capacity. Otherwise (if not full), this number is ignored.
Enter the expected or actual average net revenue per replacement patient	\$750	It is possible that the replacement patients have a different average net revenue. For instance, can you fill the new capacity with higher-margin patients, e.g elective surgery. Your finance department can help ascertain this value.

Light green colored user-cells for inputs

BOOST Data		
Estimated Annual Cost of BOOST QI Initiative	\$125,000	This figure will vary from one hospital to another and depends upon your approach to BOOST implementation, IT support, supplies, staff costs etc.

Hospital ED Data		
Annual capacity of the ED	20000	
Discharge rate from the ED (%)	90%	Most hospitals are between 85-90%.
Average net revenue per patient discharged from ED (\$)	\$500	You may need to get these figures from your finance department.
Average net revenue per patient admitted from ED (\$)	\$1,000	
Does your ED face overcrowding issues due to insufficient bed capacity, thereby causing patients to leave without being seen?	Yes	If Yes, there is a possibility that the new capacity in the target hospital unit will improve the flow from ED to unit. Otherwise, the ED data is ignored.
If yes, what is the rate of patients leaving without being seen (LWBS) from your ED (%)	4%	If you answered Yes above.
Expected reduction in LWBS rates due to improvement in patient flow from ED to target unit(s) (%)	10%	Reduction of readmissions in a hospital operating at capacity can relieve ED overcrowding by improving patient flow from ED to the floor. In turn, this can reduce patient LWBS rates for the ED.

Hospital P4P Data		
Does your hospital qualify for P4P reimbursements?	Yes	Improving transitions of care can have a positive impact on measures of patient safety, patient satisfaction, and readmissions, which may be covered by P4P reimbursements.
Total annual operating revenue (\$)	\$200,000,000	Used only for P4P computations.
Percentage of operating revenue at risk based on measures associated with transitions of care.	0.10%	Estimated 0.1-0.2%. Check with your finance department.

BOOST ROI output

Net Revenue Gain or Loss after implementation of BOOST	\$144,000	For a (non-ACO) hospital with traditional DRG (Case rate) payments
---	------------------	--

For ACO Hospitals ONLY

Is your hospital part of an ACO (Accountable Care Organization)?	Yes	If your hospital is an ACO, reducing readmissions always has a positive impact on the financials (unlike non-ACO hospitals).
Cost per readmitted patient after discharge from BOOST unit(s).	\$2,000	Typical expense for a readmitted patient.

Additional input cells and ROI output for ACO hospitals only

Net Revenue Gain or Loss after implementation of BOOST	\$319,000	For an ACO Hospital only
---	------------------	--------------------------

BOOST ROI Calculator built for Society of Hospital Medicine by Siva Subramanian PhD (siva@careinsync.com) & Win Whitcomb MD MHM (winthrop.whitcombmd@bhs.org)

References:
[1] Dedhia, P. et al. J Am Geriatr Soc. 2009 Sep;57(9):1540-6.

Once information has been entered into all the user-cells, the calculator immediately updates the output cell i.e. the ROI value showing the net gain or loss to the hospital. At this point the user can vary any of the input parameters and see how the ROI is impacted.

At the bottom of the calculator are two additional user-cells and an output cell that are only relevant if the user is modeling the ROI for a hospital that is part of an Accountable Care Organization. Non-ACO hospitals can disregard this portion of the calculator. However, it is interesting to note that, for the same data, the ROI for ACO hospitals is always better than that of a hospital with traditional DRG payments (non-ACO hospital).

Closing Points

Project BOOST can be a financially sound investment for a hospital especially with expected changes in payment policies providing incentives to reduce readmissions. The secondary benefits noted above only strengthen this case. A financial model that considers hospital specific data and incorporates primary and secondary contributors can be invaluable to the QI team for

- Understanding the true return on investment (ROI) of Project BOOST
- Evaluating the secondary opportunities specific to that hospital with what-if scenarios and
- Evaluating the initiative across various locations/departments which may have slightly different input conditions

Thus, hospitals can evaluate various strategies and benefits based on their unique situation and select the strategies that are right for them before embarking on Project BOOST.

QI Initiatives, like Project BOOST, require hospitals to adopt changes to processes, workflows, and roles and responsibilities of a multidisciplinary team. Such changes involving people are always difficult to implement. Therefore, executive support and championship as well as buy-in from key stakeholders are essential to the success of the project. Finally, integrating the process into the hospitals' IT systems can improve the likelihood of success of QI initiatives such as Project BOOST, making the outcomes repeatable, sustainable and measurable.

About the Author

Siva Subramanian, PhD is the founder of **careinsync** (www.careinsync.com), a healthcare IT company offering consulting services and purpose-built software solutions to coordinate safe and timely care transitions. He can be reached at siva@careinsync.com

The author would like to acknowledge the contribution of Win Whitcomb MD, Arpana Vidyarthi MD, and the feedback from the entire BOOST team in developing this analysis.