



Healthcare Lab (15.777)

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ROI In Healthcare Simulation



Hussein Abdallah
MEng Course 6-1, 2018



Sandhya Bhaskhar
EMBA 2018



Ravi Doddavaram
Sloan Fellow 2018



Nicholas Skipitaris, MD
EMBA 2018



Center for Education,
Simulation, and
Innovation (CESI)

Hartford, CT, USA

PROBLEM STATEMENT

We would like an H-Lab team to develop a process or framework to:

- Quantify the impact simulation training programs have on the strategic priorities of Hartford HealthCare.
- Help differentiate the probable benefit of programs and new opportunities.
- Communicate its value proposition.
- Make more informed resource allocation decisions and future investments.

BACKGROUND & RESEARCH

About Hartford HealthCare

- Integrated health care system in Connecticut, 18,000+ staff, \$2.4B annual net revenue.
- 5 acute-care hospitals around CT:
 - Hartford Hospital (867-bed)
 - Midstate Medical (156-bed)
 - Windham Hospital (130-bed)
 - Hospital of Central CT (414-bed)
 - Backus Hospital (223-bed)
- + Behavioral health and rehab services, skilled nursing facilities, senior services.

About CESI

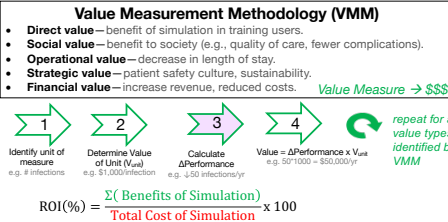


Literature Search: Calculating ROI in Simulation

COSTS

- Project Phase**
- Initial analysis
 - assessment costs
 - costs of development
 - acquisition
 - implementation
- Operational Phase**
- maintenance
 - support
 - overhead
 - labor (operation, teaching, maintenance)
 - materials/supplies

BENEFITS (Qualitative + Quantitative)



Bishop, P.F., Womers, S.M., Rogers, S.D., Ross, G. (2015) Impact and Implementation of Clinical-Based Training for Safety: Wharton Publishing Corporation, The Scientific World Journal, Volume 2015, Article ID 620298. http://www.iiste.org/Journals/article.php?journal_id=620298

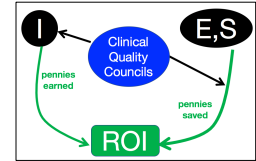
Step 3: The Greatest Challenge for CESI

- Lack of (Access to) Sound Data:** Without data on outcomes being addressed by CESI, it is difficult to ascertain causality between CESI programs and performance improvements.
- Isolating Confounders:** CESI interventions are NOT typically run in isolation.
- Statistical / Clinical Significance:** Outcomes prevented by CESI are often high-power, low-frequency events ∴ ΔPerformance can be very small.

ANALYSIS

Innovation ('Pennies Earned')

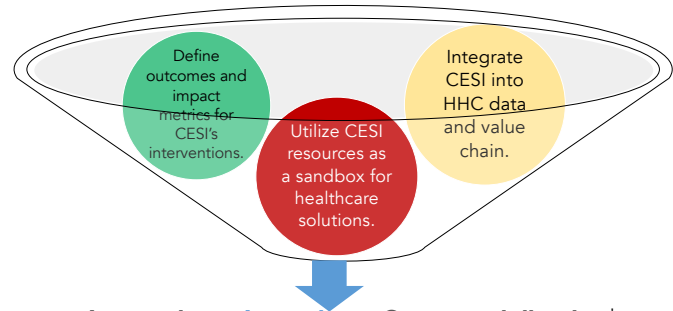
- There is tremendous untapped potential in 'I' branch of CESI.
- With the immense clinical volume nextdoor at Hartford Hospital, CESI can be a solution engine for clinical problems. In turn, this could lead to innovations in standards of care.
- If CESI has a presence on these quality councils, areas of improvement can be more aggressively targeted.
- Innovations can become intellectual property of HHC and the founding staff / clinicians, and potentially commoditized into revenue sources.
- CESI is positioned to be HHC's healthcare futurists to help the system get ahead of the trends in healthcare delivery.



Education & Simulation ('Pennies Saved')

- 'E' & 'S' programming have a very clear 'gut-feeling' value for participants, but causality between CESI interventions and any improved outcomes needs to be proven.
- Clinical Quality Councils at HHC already collect plenty of data that may be useful to this end. However, there is little cross-talk between CESI and these councils at present.

Emerging Picture of Areas for Improvement



Innovation = **Invention** x Commercialization[†]

The Critical Ingredients for Invention

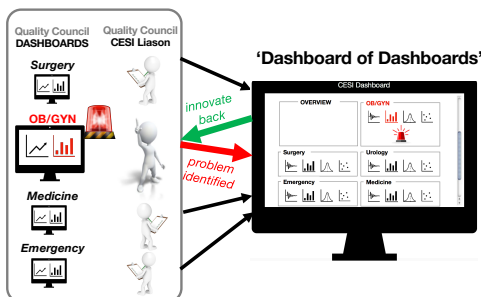
- State of the art **facilities & equipment**.
- People with **simulation expertise**.
- Risk-Free** environment for solution **experimentation**.
- Industry** relationships.
- Access to and capturing **DATA**.
- Vast expertise and volume** across the clinical spectrum at HHC

CESI should be the nexus of knowledge, skills, problem-solving and experimentation.
CESI is where invention "happens" for HHC by seeking problems to solve.

[†] William Aulet, Director of Martin Trust Center for Entrepreneurship, MIT

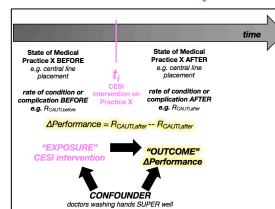
PROPOSED IMPROVEMENTS

Give CESI a 'Seat at the Table' at HHC Clinical Quality Councils

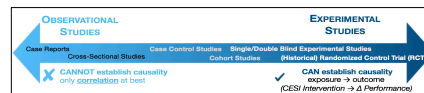


- HHC has 40+ Clinical Quality Councils in various departments, each with their own dashboards containing department-specific performance metrics.
- If Clinical Quality Councils provide data streams to CESI, a 'Dashboard of Dashboards' could be utilized for identifying points of intervention.
- CESI Liasons on each council could become familiar with CESI's facilities and capabilities, making it easier to form appropriate interventions/programs at CESI.

Implement CESI Interventions Like a Scientific Experiment



- Define endpoints and collect data before and after programming. Ideally, these endpoints would be already collected metrics from quality council dashboards.
- Make active effort to isolate confounders to the extent possible.
- To establish causality, aim for **experimental** type of study.



Dashboard Mockups



CONCLUSION & KEY RECOMMENDATIONS

Standardization of Education and Simulation Programs

- Identify 5-10 standardized programs that CESI offers year-round.
- Offer these to external parties where possible.
- Experiment with pricing to maximize revenue.

HHC Integration and Better Data Collection Practices

- Measure quality metrics in addition to volume metrics.
- Create input criteria for program selection.
- Align metrics with HHC Key Performance Indicators (KPIs) already being collected.

Innovation Project Management

- Use an IT driven workflow for new projects (use collaboration tools like JIRA, Spira, etc.).
- Enlist sponsors across HHC and agree on measurable outcomes.