# Maximizing the Benefit of Quality Improvement Activities

CE 1.5 Contact Hours

## *A Spread of Innovations Model*

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**ABSTRACT**

**Background:** Many organizations struggle to efficiently and effectively spread improvement activities. This article presents findings from a model developed to standardize the sharing of innovative ideas within nursing at an academic medical center.

**Problem:** Quality improvement activities were occurring in many nursing units but often did not spread beyond the originating unit. Challenges included variability in operationalizing initiatives, inconsistent understanding of project goals, and the lack of a dissemination process.

**Approach:** The Spread of Innovations Model was developed to ensure structure and resources are in place to spread successful initiatives. The model uses Lean problem-solving and engages frontline nurses with senior leadership when spreading internally developed best practices.

**Outcomes:** The model was piloted by spreading a catheter-associated urinary tract infection (CAUTI) prevention project throughout nursing. Using the model led to significantly decreased CAUTIs.

**Conclusions:** Improvement efforts without a process for spreading can lead to inefficiencies and variable outcomes.

**Keywords:** innovation diffusion, Lean Six Sigma, organizational innovations, quality improvement, spread of innovation

Health care organizations face continuous public, regulatory, and financial pressures to meet high quality of care standards. Unfortunately, there are too many instances when improvements fail to spread beyond a single area, resulting in duplicative efforts and variable patient outcomes. This article describes one academic medical center's (AMC) approach to developing a structure and standardized process for the spread of innovation.

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## PROBLEM DESCRIPTION

Numerous improvement initiatives, focused on reducing patient harm, improving workflow, and decreasing costs, were launched at a nearly continuous pace at this facility within the division of nursing. Although there were some local successes in nursing units, many of the improvements were never spread further across the division of nursing. Challenges included variability in operationalizing initiatives, inconsistent understanding of project goals, and varying outcomes. It is important to function in a nimble and efficient manner when conducting quality improvement initiatives, because working in silos leads to duplicative efforts, excess costs, and unpredictable patient outcomes.[1]

## AVAILABLE KNOWLEDGE

Internal and external project implementation strategies were explored to overcome the

problem of spreading improvement work. Internally, successful recent hospital-wide improvement activities appeared to share 2 common traits: a project manager-like role and strong leader engagement. Externally, existing frameworks and strategies for dissemination, sustainment, engaging staff and leaders, and reducing silos were reviewed. Common themes emerged, such as the importance of early adopters, providing adequate resources, and the necessity for project champions and leaders.[2-7] The Institute for Healthcare Improvement (IHI) "A Framework for Spread" was evaluated during this review and became the guiding framework for this project, ultimately providing the foundation for a model tailored to this facility.[7]

## SPECIFIC AIMS

In addition to findings in the literature, 3 primary factors elemental to successful spread were postulated: (1) intentionality, (2) structured process, and (3) strategic management. Based on these factors, the specific aim of this improvement activity was to design a sustainable process that enabled small-scale improvement efforts to be consistently replicated and spread throughout the department of nursing.

## METHODS

### Context

This medical center is a state-owned, 933-bed not-for-profit public AMC located in the Southeastern United States. This facility is a Magnet-designated organization with a robust and active shared governance structure. The division of nursing consists of approximately 40 unique inpatient/emergency settings, divided into 8 clinical service lines, with a nursing director responsible for each service line. Employee and patient satisfaction are among the highest in the region, and there is a long-standing history of employee and patient centeredness.

To sustain and continuously improve quality of care, the organization embarked on a Lean journey in 2010. Lean is a well-known quality improvement approach adapted from the Toyota Production System, grounded on the principles of continuous improvement, maximizing customer value while minimizing waste, and respect for people.[8]

### Interventions

To address the challenge of spreading improvement work, a Spread of Innovations (SOI) group formed, composed of an interprofessional team of clinical nurses, nurse leaders, and quality improvement experts. The group's purpose was to develop a mechanism to spread improvement activities beyond a single nursing unit, enabling the division of nursing to have a standardized process for conducting and sustaining widespread improvement work. Using the IHI's Framework for Spread as a foundation, the SOI group added detailed steps regarding the process and resources needed to spread an idea, resulting in a new model highly specific to this organization's division of nursing structure. This modified model for spread became known as the Spread of Innovations Model within the hospital (Figure).

#### *SOI Model*

In the SOI Model, there are 2 ways a quality improvement project can become nominated as an SOI initiative: (1) An individual nursing unit has completed a successful quality improvement project with demonstrated improved outcomes. This type of initiative is referred to as unit-driven initiative. (2) A performance problem related to an organizational or division goal is identified by nursing executives. This type of initiative is called nurse executive-driven initiative.

#### *Unit-driven initiative*

Once a quality improvement project is completed on an inpatient nursing unit and determined successful, as evidenced by improved outcomes and marked sustainment (minimum of 60 days), the unit evaluates the project for spread using a standardized scoring process. The scoring process is adapted from the IHI's New Idea Scorecard, which is based upon Everett Rogers' Diffusion of Innovation Theory. Rogers' theory describes how new ideas disperse through various groups of people, ultimately resulting in behavior changes.[9,10] The scoring process is completed as a small group activity by the unit staff and leaders to determine whether the innovation has potential for successful spread. The group ratings are based upon the following attributes: relative advantage (as compared with previous approach), simplicity (simple to understand), compatibility (with existing needs/experiences/beliefs of potential adopters), trialability (how well the innovation can be tested on a small scale), and observability (the degree to which the use of an innovation and results are visible to potential adopters).[9]

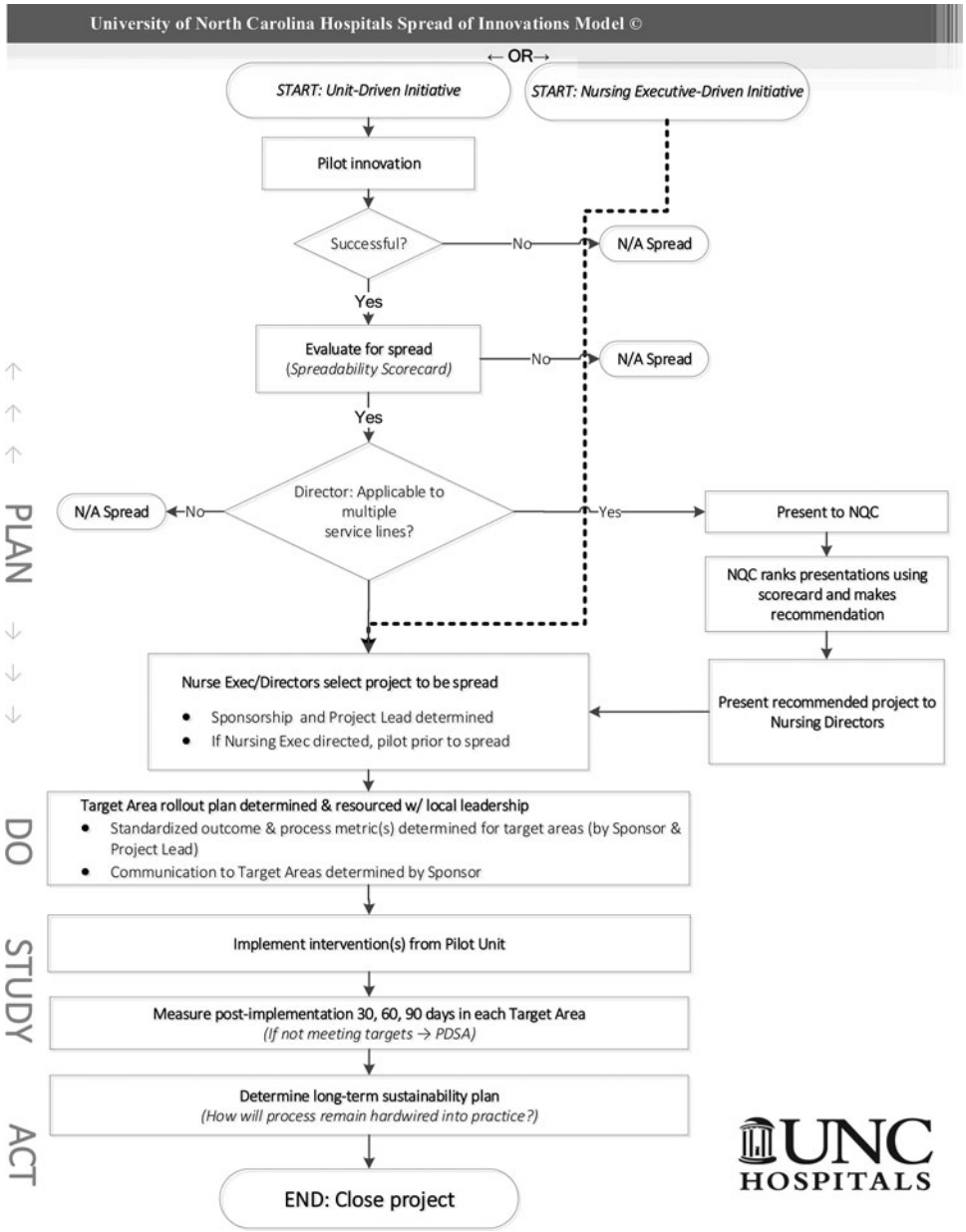


**Figure.** University of North Carolina Hospitals Spread of Innovations Model. Copyright by University of North Carolina Hospitals, 2019. Reprinted by permission of University of North Carolina Hospitals, 2019.

A call for potential unit-driven SOI initiatives is held once per year and driven by the Nursing Quality Council, one of the 5 clinical nurse-led shared governance councils. Submitted projects are presented by the original nursing unit to the Council. The Council rates each project based on organizational goal alignment, clinical implications, and likelihood of successful spread to other areas, using a 1- to 5-point scale, where 1 = none and 5 = strong. The Council discusses and sums individual ratings and collectively determines which project to endorse. The Nursing Quality Council chair and co-chair present a summary to the nursing directors and executives. This leadership review serves as a final check for organizational goal alignment.

Once the project has been identified as appropriate for spread by the nursing directors and executives, it is considered officially selected as 1 of 2 SOI initiatives for the year. The

critical roles of the SOI sponsor, who is responsible for overall accountability and enabling the team members to create change and grow professionally, as well as the project lead, an improvement coach with project management responsibility, are identified. The sponsor selects a team of various stakeholders, including a few members from the original unit project team. The SOI project lead spends approximately 1 to 3 months in the planning phase with the sponsor and the team, modifying the original project as needed so that it can be effectively scaled and spread throughout the division of nursing. An "A3", a Lean tool, which aids in problem-solving by guiding the user through a structured process of identifying the problem, analyzing current and target states, performing a root cause analysis, developing countermeasures, and tracking performance over time, is developed for each SOI project. Individual unit and hospital-wide results are shared with staff across the organization at weekly and monthly intervals, and regular auditing to ensure the new process implemented correctly is performed at the unit level.

During the deployment phase of SOI initiatives, quality improvement coaches and members of the Nursing Quality Council assist with education, improvement boards (a Lean instrument, which visually exhibits progress and encourages 2-way communication during huddles), and answering questions related to data collection and outcomes. Leader engagement is imperative throughout the process, as they are responsible for supporting the implementation, including educating staff members, leadership rounding, and sharing data and feedback related to the project.

After deployment, the SOI project team meets regularly to discuss outcomes, milestones, successes, and barriers. Plan-Do-Study-Act (PDSA) cycles of improvement are completed in the first 30 to 60 days of spread as needed. Once areas have reached desired targets, they are monitored for an additional 60 days to ensure sustainment and hardwiring of practice changes. When sustainment has been demonstrated division-wide, the project is then closed.

#### *Nurse executive-driven initiative*

Nurse executive-driven SOI initiatives follow a nearly identical process to the unit-driven initiatives, with the exception of the project being selected by the Nursing Quality Council, rather these projects are chosen by the nurse executive team based on an identified performance gap. Once a problem has been selected, a team is configured (including sponsor and project lead) and the initiative is designed on a small scale so that it can first be piloted. Following the same process as unit-driven initiatives, the improvement idea is tested for 6 to 12 weeks in 1 to 2 pilot units and refinements are made until the intervention is ready to be spread division-wide.

## Study of the interventions

#### *Testing the SOI Model: CAUTI prevention initiative*

The catheter-associated urinary tract infection (CAUTI) prevention initiative was selected by the nursing executive team as an optimal first project in which the SOI Model could be tested. A CAUTI Steering Committee had spent the previous year designing an evidence-based CAUTI prevention bundle, and the committee was eager to implement these practice changes. The SOI group partnered with the CAUTI Steering Committee, becoming the first SOI project team, and the CAUTI prevention bundle was implemented utilizing the SOI Model.

Following the process in the SOI Model for nurse executive-driven initiatives, 2 nursing units were selected to pilot the CAUTI prevention bundle: 1 medical intermediate care unit and 1 surgical acute care unit. The units were selected because they had opportunity for improving unit CAUTI rates, and because their patient populations were generalizable to other clinical nursing units. In partnership with the project team, the 2 nursing units began testing the evidence-based CAUTI prevention bundle. The following Lean practices were implemented: involving the people doing the work in decision-making process, cycles of rapid improvement, and implementing visual management (improvement boards).

The pilot unit clinical staff provided significant feedback to the project team about what worked well, opportunities for improvement, and assisted with modifying aspects of the education, data collection, and improvement boards. This critical component of the continuous improvement process allowed the project team to proactively address challenges and modify elements of the project as needed, prior to spreading the initiative division-wide. Once the pilot units had demonstrated sustained success for 6 weeks and modifications were finalized, the CAUTI prevention initiative was ready to be spread throughout inpatient nursing units. During implementation,

nursing units relied on the standardized education, tools, and data collection methods that the pilot units had refined, to educate staff and implement the infection prevention bundle. Embedded quality coaches and identified unit champions also assisted during the implementation period. Outcome and process measures were collected at the unit and aggregate level to measure success, as well as identify struggling areas. Once process and outcome measures met targets for a period of approximately 4 months, the project transitioned into the sustain phase.

### Measures

To evaluate the SOI Model, the SOI group wanted to examine both the structure of the model and the overall success of the CAUTI initiative. To assess the model, structured focus groups were used and nurse leaders and clinical nursing staff from all service lines were invited to participate. Participants were asked about their satisfaction overall with the project structure, if they would recommend continuing to use the model, helpfulness of tools and resources (education, improvement boards, Lean documentation tools, knowing who to go to with questions), and clarity of project goals.

To evaluate the overall success of the CAUTI initiative, the primary outcome measure was infection rate per 1000 device days (count of monthly CAUTIs divided by the number of urinary catheter days, multiplied by 1000). Process measures included device utilization ratio (number of urinary catheter days, divided by the number of patient days), catheter maintenance audit compliance (10 questions related to daily catheter care, measured by the percentage of audits with 10 out of 10 items performed correctly), and percentage of eligible clinical staff who completed a catheter skills validation.

### Analysis

The focus groups began by administering a survey about the structure of the SOI Model. Participants were asked to provide individual ratings using a color-coded 1- to 5-point scale (1 = strongly disagree/red to 5 = strongly agree/blue). During the focus groups each survey question was copied on a flipchart hanging in the room. Participants were asked to transfer their votes from the paper survey onto color-coded stickers and place onto the corresponding flipcharts, forming a histogram-like visual from the survey responses. This display allowed for the facilitators and participants to quickly identify survey responses that skewed low (negative), high (positive), and those that were highly polarized (approximately half of the responses strongly positive and the other half strongly negative).

The analysis of the survey responses was used to inform the focus group discussions, beginning with the lowest ranked questions, then moving to the highly polarized questions, and lastly to the highest ranked questions. Participants were asked to share "moments of truth" (eg, specific aspects/experiences) that contributed to their rating of that particular question. The moments of truth were transcribed onto the flipchart and later grouped into themes. The analysis of the responses was shared with the SOI group and led to revisions in the SOI Model.

CAUTI rates and device utilization ratios were collected and analyzed by the Infection Prevention department and provided to nursing units on a monthly schedule. Clinical staff completed weekly urinary catheter maintenance audits and Infection Prevention provided weekly status updates. Nursing units also tracked the percentage of eligible clinical staff who completed a skills validation and entered the information into an electronic database. Monthly reports indicating compliance with catheter skills validation were provided to units by the project lead.

Unit-level data were visually displayed on each unit using a standardized improvement board. The goal of the improvement board is to not only provide data transparency, but also serve as a mechanism for communication and problem-solving during unit huddles. For nursing executives and leaders responsible for one or more service lines, the uniform improvement boards allow for a standardized "status-at-a-glance" while conducting leader rounds in their areas of responsibility.

## RESULTS

Survey data from the focus group indicated that 77% of participants were satisfied overall with the project structure, and 70% indicated that they would recommend future quality improvement projects follow the SOI Model (n = 30). Based on discussions in the focus groups, the following themes were considered key aspects to the success of the initiative: initiative was well supported by hospital leadership, the project was visible, tools and resources (scorecards,

templates, and materials for improvement boards) were made available to units, and multimodal information was provided through a variety of communication channels.

Alternatively, aspects of the initiative that were described as more challenging included: difficulty cascading education from nursing managers to clinical staff, not enough lead time for units to prepare for such a large initiative, not enough flexibility for specialized areas, and not enough lateral sharing from unit to unit when there was variation in success. While many participants acknowledged they had a good understanding of individual unit performance, some noted that they had a poor sense of organizational-level CAUTI performance.

Results from the CAUTI prevention SOI initiative demonstrated improvement. Baseline data (July 2014 to December 2015) showed a mean CAUTI rate of 2.47 infections per 1000 device days. During the implementation and sustainment period (January 2016 to December 2017), the mean CAUTI rate was reduced to 1.46 infections per 1000 device days (see Supplemental Digital Content, the Figure, available at: http://links.lww.com/JNCQ/A635). Using Excel QI Macros, an independent 2-sample $t$ test was performed, comparing pre- and postintervention CAUTI data. The data sets were found to have a normal distribution, and equality of variances was tested and satisfied using Levene's test, $F(40) = 2.11$, $P = .100$. The independent 2-sample $t$ test was associated with a statistically significant difference, $t(40) = 2.021$, $P < .001$. CAUTI rates showed a statistically significant improvement after implementing the CAUTI prevention bundle using the SOI Model.

At the close of the project, the catheter device utilization ratio had decreased by over 5%. Catheter maintenance audit results fluctuated between 72% and 89% of 10 out of 10 audit items being performed correctly during the final 3 months of the project. At the end of the SOI project, 99% of eligible staff were documented as validated for performing correct catheter insertion and daily care.

## DISCUSSION

### Summary

The widespread positive results from the first SOI initiative demonstrated early success with the model. The focus group discussions provided guidance to the SOI group for continuous improvement to the model. Based on feedback gathered not only from the focus groups, but also from SOI project sponsors and leads, all SOI projects are now provided a list of recommendations such as lead times, additional resources, and stakeholders to consider, as well as leveraging existing committees and workgroups (vs creating new groups).

## CONCLUSIONS

The shared governance structure was foundational to the development and execution of the interventions. Because the improvement projects involved clinical nursing staff from the onset, staff buy-in was inherently created due to direct involvement in managing and sharing the results of each project. Staff were supported and encouraged to think creatively and be innovative with quality improvement work.

An unanticipated outcome of implementing the SOI Model was improved coordination of large-scale practice changes. Project timelines are scheduled so that nursing units are not overwhelmed by multiple project implementations occurring at the same time. While many clinical areas report they appreciate the consistency and predictability of the SOI initiatives, some perceive that the number of active quality improvement projects can be overwhelming at times. Although division-wide nursing initiatives are more coordinated, the model does not prevent other departments, service lines, or units from conducting parallel improvement activities. In addition to securing a sponsor and project lead, attention must also be given to the amount of change a unit can manage at one time. Therefore, it is important to intentionally stagger implementation and coordinate simultaneous improvement initiatives.

Attention should also be given to process measures versus outcome measures, as process measures take less lead time to demonstrate improvement and are the drivers for outcomes, thus they are often the most important factor in improvement activities.[11] A final consideration is that organizational goals should drive the selection of spread projects. Leaders should identify and focus on the most critical objectives to achieve aligned outcomes.

Improvement efforts without a process for spreading across an organization can lead to increased effort, inefficiencies, and variable patient outcomes. Spread happens when one is

intentional about it, when there is a spread process in place, and with dedicated resources to manage the spread process. Since its inception in 2016, 6 projects (3 nurse executive-driven and 3 unit-driven) have been successfully spread and sustained using the Spread of Innovations Model (2016-2019).

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