

5 PROJECTS, 5 HOSPITALS: USING DMAIC FOR RAPID QUALITY IMPROVEMENTS

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Abstract

In February 2008, the Northern Indiana Region of the Sisters of Saint Francis Health Services, Inc. commissioned the Performance Improvement Department to help minimize the impact of the new CMS MS-DRG payment structure that went into effect in October 2008. The NIR is made up of five separate hospitals, each with their own Lean Six Sigma project facilitators. The concept was born to use each of the hospital sites as the pilot site for one of the following conditions: Objects unintentionally left in surgery, Catheter associated urinary tract infections, and catheter associated bloodstream infections, Decubitus ulcers and Injuries due to falls within the hospital. Each hospital would utilize their own Lean Six Sigma team made up of front-line staff and unit process owners to work through the DMAIC process and then implement their solutions. Upon implementation, the projects would rotate to another hospital site until all five hospitals had implemented all five projects. The need was for the rotation to be completed by the October 1 deadline. Various tools were used during each project progression including: VOC Analysis, SWOT diagrams, Effort/Impact Matrices, FMEA. Each project will be discussed including the DMAIC process, what improvements were ultimately implemented as well as pilot hospital results. Also for discussion will be the mechanics of how the implementations were shared site to site, including difficulties and lessons learned.

Introduction

The Northern Indiana Region (NIR) of the Sisters of St. Francis Health Services, Inc. (SSFHS) is a four hospital five campus health system serving the healthcare community of Northwest Indiana. In 2005, SSFHS partnered with IUPUI School of Industrial Engineering to exchange and share knowledge. SSFHS learned the philosophies and methodologies of Lean Six Sigma (LSS) while IUPUI learned healthcare and how it applied to LSS. Since the initial project in 2005, over 74 projects have been implemented in the Northern Indiana Region using LSS techniques and the define, measure, analyze, improve and control (DMAIC) format.

Five Projects – Five Hospitals

As of October 2008 CMS implemented a new MS-DRG payment structure which will not allow hospitals reimbursement for particular hospital-acquired infections or “never events”. Each facility was responsible for a pilot project in which they discussed the prevention of these particular “never event” along with improving the present on admission documentation of these events. The present on admission documentation is a crucial part since the new payment structure will not reimburse for “never events” that are not documented “present on admission”. The Northern Indiana Region tackled five of the CMS “never events” taking effect October 2008. The five projects which were assigned based on current best practice, focused on by the Northern Indiana Region were the following: Objects left in surgery, Catheter associated urinary infections, Catheter associated bloodstream infections, Decubitus ulcers, and Injuries due to patient falls. Each facility brought together their own Lean Six Sigma team of front-line staff and unit based process owners to work through the define, measure, analyze, improve, and control (DMAIC) methodologies to implement solutions to these processes.

A core team, which consisted of the lead facilitators from each facility, was formed with representation from each project who came together to discuss how the projects would be effectively transition from facility to facility. Each facility had its own way of defining these events along with data collection. The first step for the core team was to standardize operational definitions and data collection form for each project that would be easily transferred from facility to facility. The standardization would prevent facilities from having to recreate the definitions and data collection forms prior to implementing the new processes.

The initial team completed a Lean Six Sigma project improving on there already established practices. The initial team, which consists of frontline staff, managers and a LSS Black Belt, will work together to define, measure, analyze, improve and control (DMAIC) CMS “never event” assigned to their particular facility. Through the intense process the teams look at such things as the Voice of the Customer, Process Maps, Process Observations, and Failure/Risk.

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Pressure Ulcer Project

St. Margaret Mercy – South Campus – Dyer, Indiana

The pressure ulcer incidence rate when this project began was at 4% with a goal to reduce the incidences of Hospital Acquired Pressure Ulcers by 50% with the ultimate goal being zero. Through the use of the Six Sigma Curriculum the team analyzed particular practices performed by staff in regard to pressure ulcers. Like all the CMS projects this was also a two-fold project which focused on the reduction of pressure ulcers along with proper documentation of present on admission. The team took the IHI's essential elements of pressure ulcer prevention in regards to pressure ulcers and developed improvements that would take each aspect of the IHI campaign into account.

The first essential element is “risk is predictable”. Comparing the Braden Risk assessments performed by the staff nurses and the wound care specialist it was found that only 34% of the assessments placed the patient in the same risk category and many times the wound care specialist placed patients in a higher risk category requiring more interventions. An annual “skin fair” was developed to reemphasize the importance of correctly assessing patients for risk. A check box was also added to the admission order sheet to ensure wound care is ordered for patients in particular risk categories.

The second essential element is “skin integrity can deteriorate in hours”. For this particular element the Emergency Department played a large part in the improvements. Since patients are holding longer in the Emergency Department and pressure ulcers can develop in hours the team decided the Emergency Department nurses would begin assessing for risk two hours after the admission orders.

The third essential element is “wet skin is vulnerable”. Moisture increases the chances for a patient to develop a pressure ulcer. Many facilities use numerous products to assist patient with incontinence issues. Many of these products do not wick moisture away from a patient's skin that pressure ulcers develop quickly. Just as an IHI mentor hospital, SMM also went totally diaper free and exclusive stocked the Medline Ultrisorb pad to replace the diapers and other incontinent pads previously used. Since the switch there have been no incidences of dermatitis at either campus.

The fourth essential element is “continual pressure increases risk”. Turning is a very important aspect in the prevention of pressure ulcers. Turning practices were not at the level SMM would like to have them at so a standardized turn clock along with a song reminder overhead were put in place to assist staff with turning patients every two hours. Along with these improvements new mattresses that relieve pressure for both campuses was budgeted. Mattress replacement has already begun at one campus and will continue until all mattresses throughout the facilities are pressure relieving surfaces.

The fifth essential element is “optimization of nutrition”. To tackle this element of pressure ulcers the team decided to adequately distribute the complete feeds and work together as a team rather than individually. This would ensure that the patients are getting the proper nutrition needed to prevent the development of pressure ulcers.

Documentation of present on admission was the second major factor in this project so the team developed a master stager program which had unit-based stagers who would document the present on admission pressure ulcers. The master stagers would ensure proper staging of present on admission pressure ulcers which had been an issue when all staff nurses staged wounds.

Falls

St. Anthony Medical Center – Crown Point, Indiana

Patient falls that occur at a facility will no longer be reimbursed for any injuries that occur. To improve the quality of care given at the facility a team was developed to decrease the fall rate. Through analyzing and measuring it was found that the majority of falls occur during a toileting activity. To improve the fall rate based on the data showing the majority of the falls occurring during the toileting activity a rounding process was developed. Staff on each unit will perform hourly rounding between the hours of 6am and 10pm and two hour rounding from 10pm till 6am. In addition to the hourly rounding an attention list was developed so that anytime a caregiver entered a patient's room specific actions were to be completed prior to leaving the room. Some of attention list items that caregivers to check while in patient's room during their rounding include the following: offer toileting assistance, assess pain levels, call light, TV remote and telephone all within the patient's reach. Finally a caregiver will make sure there

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is nothing else need by the patient prior to leaving the room.

The team found through measuring their current process that rounding carts needed to be placed in a central location on the unit to decrease the time and steps assist the patients needs during the rounding. It is also found that many times patients fall while trying to reach for a dietary tray placed out of their reach. The team developed dots that are to be placed on the patients door jam to notify dietary if the tray should be put in their reach or out of their sight to decrease patients falling to reach a tray.

The team also decided to get two patient care goals from each patient upon admission. Each patient is asked "What are two things we can do to give you very good care?" The patient's answers are documented and posted in the patient's room so that all caregivers can see and provided the care the patient has requested. A turn clock was also developed in this project to standardize the turning practices of the staff. The turn clock also assists with the turning practices needed to prevent the development of hospital acquired pressure ulcers. An education day was scheduled for all staff to be trained on the improvements prior to their implementation. To keep the staff compliant with the new improvement initiatives, non-unit staff performed audit rounds and communicated the data to the unit directors. Since the implementation in July 2008 of the above improvements there has been a 23% reduction in the fall rate. Although there have still been patients falls with this reduction there have been no injuries due to any of the falls.

Catheter Associated Urinary Tract Infections

St. Margaret Mercy – North Campus - Hammond, Indiana

Catheter Associated Urinary Tract Infections is the most common hospital acquired infection in the United States. To date, there is not much knowledge of national data that exists describing what hospitals in the United States are doing to prevent this safety problem. With this in mind St. Margaret Mercy decided to look into its own data and find out exactly how many hospital acquired urinary tract infections the facility has seen to determine what improvements need to be done. It was found through the data that seven hospital acquired urinary tract infections occurred. It was found through the data

collection that the majority of the patients who had UTI's were admitted through the Emergency Department. The Emergency Department along with other units who admit patients were the areas in which the present on admission documentation would be focused. Since it is vital to reimbursement that the infection is documented present on admission the improvements needed to be focused on the primary departments in which the majority of our patients were admitted. In addition to the present on admission documentation, the team felt that the device days was another vital aspect in preventing a urinary tract infection. It was noted by the team that the facility had an average catheter duration of approximately five days. The team separated their improvements into three different categories: Reducing catheter days, Education of staff on insertion techniques and POA documentation. Currently nursing staff use a Kardex to relay information to different members of the staff. The team developed a new portion to the Kardex which included information about how long the patient had been on a catheter so that staff could assess for medical necessity. A standing order and policy were implemented to remove a catheter without a physician order following specific criteria outlined in the policy. Device days was an important aspect of this project since the longer a catheter is in a patient the higher risk that patient has of getting an infection. Many policies were revised to include criteria for catheter medical necessity and removal of the device. Just as in the pressure ulcer project, a song is played once a day to remind staff to check Foley patients and assess for medical necessity. Continuous reminders and various improvements address the issue of the length of device days used house-wide. Staff was also educated on proper insertion and anchoring of the catheters. The other important aspect of the team's improvements focused on the present on admission documentation. To ensure patients entering the system with an indwelling catheter were being assessed for an infection at admission a standing order for a urinalysis. Although with this a standing order for a urinalysis for every patient receiving an indwelling urinary catheter was also put in place.

Central Line Infections

St. Anthony Memorial - Michigan City, Indiana

A primary bloodstream infection can occur in a patient that had a central line within a 48-hour period before the development of the bloodstream infection. In the United States approximately 250,000 Central Line infections occur each year in hospitals. The mortality

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rate for the bloodstream infections is about 17.7%. Hospital acquired bloodstream infections prolong a patient's hospital stay by an average of seven additional days. Throughout 2006 various units of the hospital instituted a PICC team to insert the lines and assist with the spread of infections. The central line bundle was put into place on the ICU units. The Institute for Healthcare Improvement developed a central line bundle based on a group of evidence based interventions for patients with intravascular central catheters that, when implemented together, result in better outcomes than when implemented individually. The key components of the ICU central line bundle are:

- Hand Hygiene
- Maximal Barrier Precautions Upon Insertion,
- Chlorhexidine Skin Antisepsis
- Optimal Catheter Site Selection, with Subclavian Vein as the Preferred Site for Non-Tunneled Catheters
- Daily Review of Line Necessity with Prompt Removal of Unnecessary Lines

The Institute for Healthcare Improvements ICU bundle was already in place at St. Anthony's along with the other Northern Indiana Region hospitals, so the team was able to take this opportunity evaluate how well the bundle was working on the ICU and could be done to transition the bundle house wide. Along with the prevention of infections, just as many of the other projects this was also a two-fold project dealing with present on admission documentation. Currently the facility has an admission/discharge nurse program which does 90% of the admissions entering the system. So the admission nurses would be handling a large portion of the present on admission documentation for the central lines and many other CMS "never events". Improvements were made by the team primarily in two areas. First the improvement and education of the central line bundle to move house wide. Second was the addition of these infections that could be present on admission to the facility. It is imperative to get the infections document upon admission so the proper treatment and reimbursement can take place. The infection rate for central lines with use of the bundle was at 0 infections so the major improvement was to take that bundle and implement it into the non-ICU units' house wide. They will also begin to track compliance and infections with the use of the bundle house wide. Up until now central line infections were not tracked in areas other than the ICU. Many of the other improvements included education of the staff on the central line bundle along with educating the physicians on proper Present on

Admission documentation. Physicians play a significant role in the documentation since medical records can only accept a physician's documentation for present on admission. Clinical documentation specialists in the medical records department took on the responsibility to monitor and continually educate the physicians on the proper documentation needed for the new present on admission criteria. This particular project dealt more with education of physicians and staff about the ICU bundle that was being transferred house wide. Important to the transferring of the bundle is the tracking of compliance with the bundle so that you can ensure the same results of a zero infection rate house wide.

Objects left in Surgery

Franciscan Physicians Hospital – Munster, Indiana

Franciscan is our facility that does a large amount of surgical procedures so they took on the task of improving the surgical procedures to prevent the retention of a foreign object during surgery. Since it has been years since any facility in the Northern Indiana Region of SSFHS had retained a foreign object in surgery this project needed to look at areas that could improvement to guarantee that an object would not be retained. Currently in the State of Indiana there are 23 cases of a foreign object retained in surgery. Currently all facilities had a surgical procedure policies that included such things as timeouts, recounts, emergency procedures and other aspects of the surgical process. The team looked at each of these policies and drafted a policy that encompassed everything to make on Northern Indiana Region Surgical Policy. Along with the counts and recounts our facility also has the radio opaque towels. Although towels are not allowed during a surgical procedure there are still cases where physicians will insist on a towel which must be radio opaque. Written into the policy following emergency procedures where counts are waived a mandatory x-ray must be performed to guarantee that no objects have been left particularly in the abdominal area. The x-ray is to be read prior to the patient leaving the surgical suite. The education of staff on the importance of signing all counts and continually communicating throughout the procedure to ensure appropriate counts of sponges at the end of the procedure. If counts are incorrect they are to be documented with the surgeon notified and an incident report filed. Continual education of OR staff on the policies and procedures of timeouts and counts with an annual competency exam to guarantee knowledge. Physicians are also educated on the surgical policies

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during their credentialing process and each time they are re-credentialed. Although there have been no incidences objects being left in surgery for a number of years at any of our facilities improvements still needed to be made to ensure something never happening because litigation costs for an event such as this can be costly to a facility.

primary reason why she was chosen to direct the Northern Indiana Regions five hospitals to project successes.

Kathryn Lannon has a Bachelors of Arts Degree in Public Relations and a Masters in Business Administration both from Purdue University. Kathryn is the Performance Improvement Analyst for the Northern Indiana Region. This position is responsible to five of the Sisters of St. Francis hospitals; St. Margaret Mercy-Hammond, St. Margaret Mercy-Dyer, St. Anthony Hospital-Crown Point, St. Anthony Hospital-Michigan City and Franciscan Physician Hospital-Munster. Kathryn has been in her current position with the Sisters of St. Francis Health Services, Inc. since the beginning of 2008. Prior to joining the regional team Kathryn worked in numerous other roles for St. Margaret Mercy. Kathryn is currently working on a Regional Project team in conjunction with the CMS indicators to improve patient outcomes and virtually eliminate hospital acquired conditions.

Conclusion

The implementation of these five projects had a dramatic impact on creating an environment of best practice and better patient outcomes. A financial impact upon our five locations with regards to CMS reimbursements was evident as hospitals could document present-on-admission conditions and reduce hospital-acquired conditions, both with a final positive presentation

A decision was made to split up the five projects and hand-off each project to the hospital with the best processes already in place. In doing so, process improvements were added to the already stable processes insuring that the process was the exceeding expectations. Once implementations were ready at each location and pilot complete, the five hospitals flipped the five projects and using best practice, implemented pilots at the new locations. This practice continued until all five hospitals had implemented all five projects with outstanding results.

In addition to the successful projects, an important occurrence has been the development of solidarity amongst the five locations.

Biographical Sketch(s)

Chris Vanni has a Bachelors of Science Degree in Organizational Management and her Masters Degree in Quality Assurance. Chris is the Northern Indiana Regional Manager for Performance Improvement. This position is responsible for five of the Sisters of St. Francis hospitals; St. Margaret Mercy-Hammond, St. Margaret Mercy-Dyer, St. Anthony Hospital-Crown Point, St. Anthony Hospital-Michigan City and Franciscan Physician Hospital-Munster. She started working for the Sisters of St. Francis Health Systems in the Clinical Laboratory in 1986. In 1999, Chris became the Project Manager for the lab working on quality improvement projects. In early 2005, She began implementation of Lean Six Sigma Projects and became the first Six Sigma black belt in the system. Her commitment to the Lean Six Sigma initiative is the