Learning outcome, instructions for completing the evaluation, and statements of disclosure can be found on page 20.

Decreasing IV Infiltrates in the Pediatric Patient – System-Based Improvement Project

Tracie Wilt Major and Tricia K. Huey

Intravenous infiltrates pose tremendous risk for the hospitalized pediatric patient. Infiltrate events increase hospital-acquired harm, the number of painful procedures, use of supplies, length of stay, and nursing time; it threatens relationships essential in patient- and family-centered care. The goal of this quality improvement project was to achieve a 10% decrease in the baseline infiltrate rate on two inpatient units and in the overall infiltrate rate across all of the pediatric units. A Lean Six Sigma methodology was used to guide project activities. Improvement strategies focused on evidence-based education, intravenous (IV) catheter securement, and family engagement. A comparative purposive sample was used to evaluate the pre- and post-implementation period to determine if desired project success measures were achieved. Data analysis revealed positive results across all units, with the number of events (n = 51 pre; n = 19 post) and the infiltration rates (13.5 pre; 7.1 post) decreasing over a three-month period. A decrease was also noted in the overall percent of IVs that infiltrated in the first 24 hours (45% pre; 42% post). A statistically significant increase (t = 15.16; $p <$ 0.001) was noted in nurses' education pre- and post-assessment survey scores. The family engagement strategy revealed overall parental responses to be 88% positive. By decreasing infiltrates, quality of care improved, resulting in the delivery of safe, effective, and patient-centered IV therapy.

Peripheral intravenous (PIV) therapy is one of the most frequently used therapeutic interventions in the acute care setting (De Lima Jacinto, Avelar, & Pedreira, 2011). The nurse is responsible for ensuring that the intervention is provided in a safe, effective, and patient-centered manner. In the acute care pediatric setting, starting and monitoring intravenous (IV) therapy is challenging and poses significant risk to small infants and children (Amjad, Murphy, Nylander-Housholder, & Ranft, 2011; Anson, Edmundson, & Teasley, 2010; De Lima Jacinto et al., 2011; Doellman et al., 2009; Dychter, Gold, Carson, & Haller, 2012; Walsh & Schad, 2012). Thigpen (2007) cited infiltrations as the most common complication of IV therapy. Pettit (2003) noted that infiltrate rates vary from 23% to 78% and can have long-term sequelae. As the nursing profession continues to support clinical practice with the best available evidence, routine IV practices and traditions must be challenged to ensure quality care is provided to every patient, and health care resources are utilized in a prudent manner.

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Acknowledgment: *The authors thank the project team and nursing staff for their hard work on this project. The IV dressings for the trial and product in servicing were provided by 3M™.*

Disclaimer: *The companies mentioned in this article, 3M™ and GetWellNetwork™, did not have any involvement in project design, data interpretation, or manuscript development.*

Across acute care pediatric settings, opportunities exist to closely examine the nursing care factors that potentiate the risk of IV infiltrates in hospitalized infants and children. To address these opportunities, a system-based improvement project was implemented to actively engage key stakeholders and positively impact the routine nursing care for children receiving IV therapy.

Background and Significance

The need for this project was derived from an increased trend noted in infiltrate events within a 100-bed pediatric hospital in the Southeast United States. The pediatric hospital is part of a larger 800-bed regional medical center and health system. The increase in infiltrate events was noted by the clinical nurse specialist's participation in multi-disciplinary rounds, reviewing safety events, and parent concerns. Some of the recognized problem areas included excessive taping, inability to visualize the site, probing for the vein on insertion, discounting pain, and allowing an IV to remain even when the integrity is questionable. Compounding the problem was the limited understanding of the nursing staff regarding the negative effects that infiltration events can have on the patient, family, quality of care, nursing time, institutional liability, resource utilization, and reimbursable services. Due to the complexity of the acute care environment, lack of knowledge, and limited exposure, the pediatric nurse may not appreciate the potential harm and long-term effects of an infiltrate. This quality improvement project integrated the Institute of Medicine (IOM) (2001) aims of safe, efficient, effective, and patient-centered care by focusing on improvement efforts in the pediatric patient receiving IV therapy.

Institute of Medicine Aims

The IOM (2001) states that health care organizations and professionals

should work to reduce the burden of illness and improve the health for those who seek care in a manner that is efficient, safe, effective, and patient-centered. The IOM (2001) further specifies that care should be safe and not produce harm. Avoiding the use of interventions when not needed is a means to ensure care is effective and safe. Further, through efficient care, waste is eliminated, and a more optimal patient care experience is created (IOM, 2001).

Supporting Data

Since 2010, IV infiltrates in the pediatric population have been monitored using the National Database for Nursing Quality Indicator (NDNQI) measure (American Nurses Association [ANA], 2014) within the project leader's organization. In accordance with the NDNQI guidelines for the peripheral intravenous infiltrate indicator, data were collected monthly on a selected day to determine the prevalence in the pediatric inpatient population. After two years of gathering and submitting data to NDNQI, the prevalence incidence and comparative data with other institutions was zero. One might believe this reflected a defect-free environment; however, based on real-time knowledge, frequency, and the severity of known infiltrate events, the NDNQI prevalence data did not comprehensively capture the overall infiltrate incidence. Similarly, Hetzler, Wilson, Hill, and Hollenback (2011) noted limitations with the NDNQI peripheral infiltrate measure, and identified the need to establish other means for internal and external benchmarking. Understanding the true incidence of infiltrate events was necessary to develop a meaningful plan for improvement.

During the baseline time frame of October 2011 to November 2012 across five inpatient units, 172 infiltrates occurred in 19,345 peripheral intravenous catheter days. For this same timeframe, monthly individual unit rates varied significantly, demonstrating a lack of control in the prevention of IV infiltrates. During this same time period, the overall mean infiltrate rate across all in-patient units was 8.9 per 1,000 peripheral intravenous (PIV) days, with 63% of these events occurring on two of the inpatient units: medical unit (n = 53; mean rate per 1,000 PIV days of 9.1) and surgical unit (n = 56; mean rate per 1,000 PIV days of 8.5). Forty-five percent (n = 75) of IVs that infiltrated did so in the first 24 hours, and 75% (n = 130) infiltrated within 48 hours from initiation. Thirty percent (n = 51) of events occurred in children less than one year of age. The site location for 89% (n = 153) of events was the upper extremities (arm, hand, or wrist). At the time of the infiltrate, 88% (n = 151) of patients had intravenous fluids infusing. Using the Infusion Nurses Society (INS) infiltrate scale of 1 (least severe) to 4 (most severe), 78% (n = 134) of events were documented as a two (INS, 2011b).

Literature Review

The need to focus on prevention is an important finding from the literature regarding infiltrations in the pediatric population (Amjad et al., 2011; Doellman et al., 2009; Rosenthal, 2007; Walsh & Schad, 2012). The literature supports education for pediatric nurses to improve the holistic delivery of intravenous therapy by assuring that nurses are knowledgeable and competent in their venipuncture practice (Anson et al., 2010). Infiltrate education should encompass IV insertion, catheter securement, site assessment, risk factors, consequences, cost implications, and legal considerations (Doellman et al., 2009; Gosen, 2012).

The literature consistently reports that the pediatric population is at significant risk for infiltrations, and the outcome of such events can be devastating to the child, parents, and health care team (Doellman et al., 2009; Dychter et al., 2012; Walsh & Schad, 2012). The outcome from an infiltrate event can range from edema in an extremity to full-thickness skin loss, muscle or tendon necrosis, and in some cases, even amputation (Doellman et al., 2009; Hadaway, 2007).

The literature recommends reviewing INS standards with nursing staff and incorporating them into institutional policies (INS, 2011a). Injury to the vein wall during insertion has been cited as a contributing factor for infiltrations (Hadaway, 2007; INS, 2011b; Walsh & Schad, 2012). Selection of the appropriate site and avoidance of flexion joints (i.e., wrist or antecubital fossa) are important in preventing infiltrations (Hadaway, 2007; Joanna Briggs Institute, 2008; Rosenthal, 2007). Use of the smallest gauge catheter is also recommended to allow optimal blood flow around the catheter within the vein (Hadaway, 2007; Joanna Briggs Institute, 2008; Rosenthal, 2007). Pain at an intravenous insertion site warrants intense investigation, and attempts to save a difficult IV can result in a negative patient outcome (Dougherty, 2008; INS, 2011a). Hadaway (2007) noted that pain at an insertion site is an immediate indication to stop the infusion, and severe complications can occur as staff continue to look for explanations for the pain.

Patient and family education can play a vital role in early recognition and limiting tissue injury (Anson et al., 2010; Dougherty, 2008). Parent education on a normal site, complaints of IV pain from the child, increased agitation and/or anxiety in the child, or infusion device alarms are all helpful pieces of information the parent can use to alert the nurse to potential issues.

Additionally, proper securement of a peripheral device is imperative to prevent dislodgement and trauma to the vessel wall. Traditional taping techniques can obscure site assessment, prevent early detection of complications, and require significant nursing time (Hadaway, 2007). Redelmeier and Livesley (1999) noted in one hospital that 74% of tape specimens were contaminated by pathogenic bacteria. Transparent, semi-permeable dressings have been widely used to secure IV catheters (Joanna Briggs Institute, 2008; Scales, 2008; Walsh & Schad, 2012). Transparent dressings are traditionally easy to use, promote visualization of the site, and secure the catheter. The use of a securement device is a preferred alternative to tape when feasible (Hetzler et al., 2011; INS, 2011a). Various commercially manufactured securement devices are available, such as StatLock® by Bard Access Systems (Scales, 2008). Securement devices have been noted to reduce complications, prevent catheter dislodgement, and prolong dwell times (Frey & Schears, 2006; Rosenthal, 2005). Available data on securement devices are limited (INS, 2011a) and warrant careful consideration of proposed benefits, risks, and costs before translating into clinical practice.

Further consideration should also be given to the practice of maintaining intravenous therapy in the con-

tinuous infusion mode versus the use of intermittent flushes for catheter patency. Hetzler et al. (2011) noted the use of a keep vein open (KVO) rate was perceived to be a protective measure by some pediatric nurses to maintain the patency of an IV when no fluids were required. In the neonatal population, the use of intermittent flushes has not been associated with decreased cannula life or loss of catheter patency (Flint, McIntosh, & Davies, 2009). Further, IV pumps do not cause nor prevent infiltrations (Amjad et al., 2011). Hadaway (2007) noted that even though IV pumps do not cause infiltrations, the continuous force of the fluids into the subcutaneous space can make the situation worse if not detected quickly. These are all important considerations in understanding the limitations of infusion devices and how processes are structured in the acute care pediatric environment.

The use of an infiltration scale for consistent and accurate documentation of events is essential (Amjad et al., 2011; INS, 2011a; Rosenthal, 2007). Promoting a culture that supports reporting all occurrences of infiltrations as adverse events and investigating common threads is recommended as a best practice (Doellman et al., 2009; Hadaway, 2007; INS, 2011a). Consistent with the safety culture literature, the challenges in voluntary reporting of any safety event has been noted and that the actual incidence is often many times greater than what is reported (Barnsteiner, 2012). Gosen (2012) noted in a quality project performed at Johns Hopkins Medical Center that staff did not consistently report infiltrate events. In the pediatric acute care setting, recognizing and reporting infiltrations as adverse events is key in promoting safer IV practices.

Performance Improvement Model

The Lean Six Sigma model was used to support this project, which focuses on eliminating waste (or muda), decreasing defects (errors), and improving efficiency (Lighter, 2013). Lean Six Sigma is patterned after the world-class practices of leading companies, such as Toyota, Motorola, and General Electric (Hadfield, Holmes, Kozlowski, & Sperl, 2010). Using the principles of Lean Six Sigma, projects must be customer-focused, strategically aligned with organizational priorities, and have sound defensible data to drive the project (Lighter, 2013). For this quality improvement project, the patient/family were the primary focus, project goals were aligned with the organizations strategic plan, and baseline data served as the foundation for guiding project activities. The desired success measures were determined collaboratively with the project team and nursing leadership. The project scope was defined as all in-patients (one day to 17 years old) who had peripheral vascular access and incurred an infiltrate event during the inpatient admission. Infiltration was operationally defined as the infusion of a non-vesicant fluid into the tissue (Amjad et al., 2011; Doellman et al., 2009).

Purpose

The purpose of this project was to achieve a 10% decrease in the infiltration rate over the six-month span of the project on the medical and surgical in-patient units and the overall infiltrate rate across all of the pediatric units in the organization. Nursing leadership and the project team agreed that a 10% decrease was a reasonable goal for the scope of the project and would positively impact the outcomes for patients receiving IV therapy. The pediatric emergency department was a key participant in the project because 50% of the IVs were initiated in this clinical area. Impacting pediatric nurses' practice in the emergency room and on the inpatient units was considered important to the success of the project.

Method

Design

The design of this quality improvement project was composed of three steps: education, interpreting infiltrate data, and collecting parent responses from GetWellNetwork™. The first step was the pre- and post-assessment survey used to evaluate the education intervention. The sample was composed of the staff within the pediatric acute care units and emergency department. A paired *t*-test was used for analysis.

The second step was a purposive sample used to evaluate the number of infiltrates, infiltrate rates, and dwell time within the three-month period before (March to May 2012) and after the strategy implementation (March to May 2013) to control for the seasonal admission patterns within the acute care pediatric environment. This sample consisted of pediatric inpatients between the age of one day and 17 years with an IV. The primary data collection source for the identification of infiltration events was an electronic audit generated from the nurse's documentation. The audit captured all patients who had a PIV catheter charted in the electronic medical record and if an infiltration was documented. Each infiltration was reviewed by the project leader to gather additional details, such as IV catheter size, location, length of time catheter was in place, INS grade of infiltrate, agent infusing, and the unit where the IV was started. The electronic audit provided the number of PIV days necessary for calculating the infiltrate rate. The infiltrate rate was calculated by taking the number of infiltrates dividing by the total number of peripheral intravenous days and multiplying by 1,000. From these data, the individual unit infiltrate rates, infiltrate rate across all inpatient units, and the percent of infiltrates that occurred in the first 24 hours from catheter initiation were calculated.

The third step was to calculate the parent responses from the IV question (Does your child's IV look okay?) on the GetWellNetwork. The GetWellNetwork is a sophisticated technology that uses the television to actively engage the hospitalized patient in creating the optimal experience (GetWellNetwork, 2012). The technology supports the patient/family to share and exchange information in real time across an organization. Using this technology that was already in place, the GetWellNetwork enabled the family to provide immediate feedback on their opinion of the child's IV site. The question was answered using a keyboard that interfaced with GetWellNetwork. Parents in every occupied room received the question daily for the duration of the child's length of stay. If a selection of "no IV" was made by the parent, these responses were excluded from the sample. Data were retrieved by the project leader electronically from GetWellNetwork via web application. Descriptive statistics were used for analysis.

The project was approved by the Nursing Research Council and the

Institutional Review Board at the University of South Alabama as part of the project leader's doctorate of nursing practice capstone project. Minitab® statistical software for quality improvement was used to analyze descriptive data (Brook, 2010). Minitab is commonly used by Lean Six Sigma leaders and is considered the industry standard for Lean Six Sigma and operational excellence (Brook, 2010).

Improvement Strategies

Based on the project's baseline data, available evidence, and project goals, improvement strategies were developed and agreed on by the Lean Six Sigma team. The team's energy was focused on three key strategies: staff education, IV securement method, and use of GetWellNetwork to engage the family. Each key strategy is described below.

Staff education. The project leader provided education in January 2013, which consisted of a one-hour presentation to the nurses. Education goals included increasing awareness of the impact of infiltrate events, application of evidence-based best practices, and understanding baseline data. Continuing nursing education hours were offered for all seven presentations, with nurses composing 96% of attendees.

A 10-item knowledge assessment survey was administered to every nurse that attended the education. The assessment survey was administered immediately before and at the completion of each education session. The project leader developed the assessment survey based on the current literature, past safety events, and knowledge gaps of staff. The survey was piloted with a small group of nurses for clarity and content. Examples of items on the assessment survey included identification of medications that increase the risk of an infiltrate; use of the INS infiltrate scale to grade an infiltrate event, and differing between an infiltrate, extravasation, and phlebitis.

IV securement method. Based on the problem areas previously described, the need existed to challenge the current practices of the nurses in their routine insertion, taping, and securement methods. The project leader reviewed IV securement options with the project team, and two new IV dressings were selected to be trialed on the medical, surgical, and pediatric emergency room units. The two IV dressings selected were to accommodate the size differences in the patient population. One was a transparent advanced securement dressing that would accommodate the majority of the population, with the exception of very small infants. The enhanced features of this advanced securement dressing in comparison to traditional transparent dressings included a stabilization border, patented film adhesive, which strengthens over 24 hours; deep notch for the catheter; and sterile tape strips (Tegaderm™ I.V. Advanced, 2012). The second dressing was a smaller transparent film dressing with a border, notched design for the catheter, and sterile tape strips (Tegaderm™ IV Transparent Film Dressing, 2014). The two dressings resembled each other, but the smaller dressing did not have the patented advanced film adhesive.

The project leader provided an in-service for the staff on the dressings and goals for using the products: a) one sterile tape strip was to be used on the IV catheter (if necessary), b) the securement/transparent dressing placed directly over IV catheter, c) insertion site was required to be visible, and d) minimal tape on extremity and remaining tubing. Thirty-nine product evaluations were received during the 14-day trial on the medical, surgical, and emergency departments. The majority of staff provided positive feedback regarding the dressings during this time frame. Product evaluations were analyzed by the project leader and presented to the team. The project team endorsed the trial dressings, which were placed on all of the pediatric units by end of February 2013.

GetWellNetwork question. Once the nurse initiated the IV, the family was provided a basic explanation of the therapy, goals, and what the site should look like. Together, the nurse and family looked at the site, and the family was encouraged to notify the nurse with any concerns (e.g., appearance in extremity size; child complained of the site hurting; tape was thought to be tight or not secure enough). The question on GetWellNetwork (Does your child's IV look okay?) was discussed with the family after the IV was initiated, and they were instructed that the question would appear daily around lunch for the duration of the hospitalization.

If a parent answered "no" that the site did not look okay to them, an electronic trigger was sent to the hospital paging operator, who in turn notified the unit of the parent's response. The nurse was expected to immediately go and check the IV and discuss the concern with the family and/or child as appropriate (see Figure 1). This question was a small step in an attempt to strengthen the parent/nurse partnership, promote patient/family-centered care, and support collaborative decision-making.

Results

There was a statistically significant difference (t = 15.16; p < 0.001) between the nurses' knowledge before (n = 57; mean = 61.75; SD 14.16) versus after the educational intervention (n = 57; mean = 92.11; SD = 8.40). The infiltrate rate per 1,000 peripheral IV days for the medical unit was 9.6 pre-implementation compared to 7.0 post-implementation; for the surgical unit, it was 12.3 pre-implementation compared to 7.3 post-implementation; and overall across all units was 13.5 pre-implementation compared to 7.1 post-implementation.

The mean catheter dwell time prior to the infiltrate event on the medical and surgical units pre-implementation was 39 hours compared to 34 hours in the post-implementation period. The mean catheter dwell time prior to the infiltrate event across all of the units in the pre-implementation was 41 hours compared to 45 hours post-implementation. The percent of IVs that infiltrated in the first 24 hours on the medical/surgical units and the overall rate across all of the units are displayed in Table 1.

The number of infiltrates that occurred on the medical unit was 11 pre-implementation and 5 post-implementation; surgical unit was 16 pre-implementation and 6 post-implementation. The overall number of infiltrates across all units was 51 pre-implementation and 19 post-implementation.

In the post-implementation period, the results of the GetWellNetwork IV question from the parents on the medical unit achieved an 88% ok response (n = 395; okay = 347; not okay = 48) and on the surgical unit achieved a 91.2% okay response rate (n = 285; okay = 260; not okay = 25). The results of the GetWellNetwork IV question from the parents across all of the units achieved an 88% okay

Figure 1.
Flow Diagram of GetWellNetwork™ IV Question

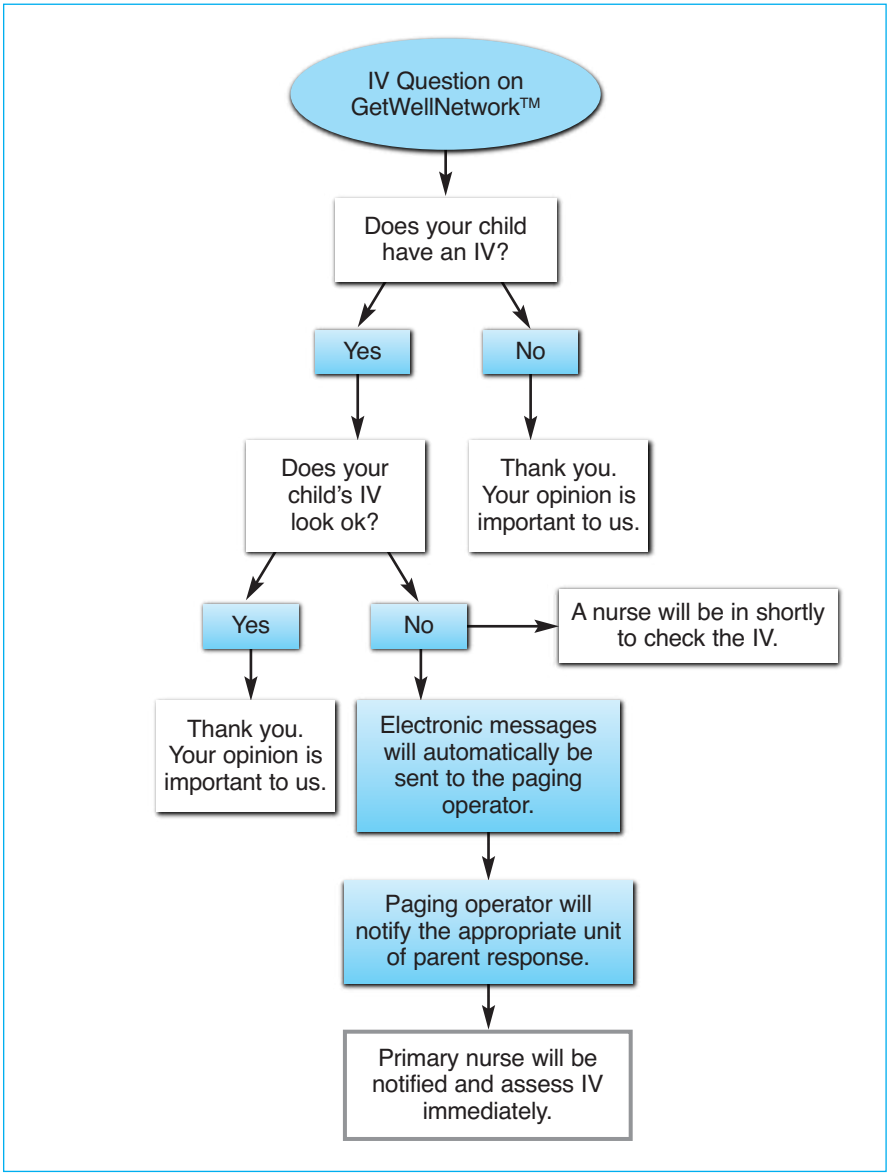

Table 1.
Percentage of IVs that Infiltrated in First 24 Hours

Patient Unit	Pre-Implementation	Post-Implementation
Medical and surgical units	52% (n = 14)	36% (n = 4)
Overall across all units	45% (n = 23)	42% (n = 8)

Table 2.
Desired Success Measures for Infiltrate Rates

Patient Unit	Desired Success Measure Infiltrate Rate per 1,000 PIV Days*
Medical	8.6
Surgical	11.1
Overall across all units	12.2

*Reflects 10% decrease from pre-implementation period.

response rate (n = 1,252; okay = 1,104; not okay = 148).

Discussion

Decreases in the individual and overall infiltration rates were noted. Results of the individual and overall rate exceeded the desired success measures set by project team (see Table 2). The decrease in the number of events (n = 32), infiltrate rates, and the number of occurrences that infiltrated in the first 24 hours was associated with project improvement efforts. By helping nurses understand baseline data for the project and increasing their awareness of infiltrate events, the importance of the initiative was evident. The pre-assessment survey scores indicated a low level of knowledge, but subsequently, after education, the post–assessment scores increased significantly (t = 15.16; p < 0.001). The education on nurse's skill in the IV insertion process was thought to positively affect the number of IVs that infiltrated in the first 24 hours. By improving the insertion skills of the nurse through education, injury to the vessel wall was limited, thus decreasing the risk of an infiltration. In the event that the vein wall was inadvertently injured during insertion, the increased attention to the site assessment allowed for the detection of inconspicuous changes due to the slow infusion rates (Hadaway, 2007). Decrease in the medical and surgical units catheter dwell time (39 to 34 hours) prior to an infiltrate event is related to the small sample (n = 11) in the post-implementation period or possibly other reasons not determined within the scope of this project. The catheter dwell time prior to the infiltrate event across all units increased from 41 to 45 hours. The increase in catheter dwell time was correlated with the focused education on limiting vein probing, optimal site selection, and standardized catheter stabilization. Additional scrutiny is needed to identify means to limit vein trauma on insertion, decrease the percent of IVs that infiltrate in the first 24 hours, and safely increase the catheter dwell time.

The change in the IV securement method is linked to playing a role in the decrease in the number of infiltration events. The use of the new IV dressings was one means to address old practices, discuss alternatives, and produce the desired behavior change

of maintaining insertion site visibility. Education and the new dressing routine prompted nursing staff to change the IV securement method and refrain from excessive taping. Multiple education attempts had been made on previous occasions to alter the nurse's IV taping practices and maintain the visibility of the insertion site, but had not been successful due to limited support from staff. The new dressings help promote the increased visibility of the IV site by the use of sterile tape strips and not taping over the insertion site. The increased visibility aids in the early detection of infiltrate events. The new dressings provide easy application, sterile tape strips, and adequate catheter securement. With continued use of the new IV dressings across all units, nurses have provided feedback to the company on possible product enhancements, such as increasing the length of the sterile tape strips and the adhesive property on the smaller dressing.

The GetWellNetwork IV question served to refocus the bedside nurse on the importance of engaging the family. On admit, the question is reviewed with the family, and emphasis is placed on the importance of receiving their feedback throughout the hospitalization. Some limitations of the IV question of the day that need further exploring are the understandability of the question by the parent, unintended responses (i.e., in some cases, the child may have answered because he or she had the keyboard at the time the question appeared on the television and may not have entered an accurate answer), and non-English-speaking options.

The projected average cost for an infiltrate event was estimated to be $500.00 of added expenses incurred during a hospitalization. This cost represents the financial resources calculated by the project leader needed to support extended nursing time, lengthened physician time, extra material costs, nurse manager time, performance review/safety team time, and additional in-patient hours due to extended length of stay (see Table 3). During the baseline data analysis of October 2011 to November 2012, 172 infiltration events represented a projected net loss of $86,000. In the pre-implementation period of March to May 2012, 51 events occurred across all of the units (an average of 17 events/month), representing $25,500 of lost revenue per quarter, equating to an annual loss of $102,000. In the post-implementation period of March to May 2013, 19 events occurred across all of the units (an average of 6.3 events/month) denoting a quarterly cost savings of $16,000 and $64,000 annually. The costs associated with the patient's pain and suffering from an infiltrate event are difficult to quantify, but are significant and cannot be overlooked. These costs encompass the pain and suffering of the patient, stress and worry on the parent, and the emotional burden placed on the nurse related to the potential harm occurring to one's patient while providing care.

Table 3.
Projected Costs Associated with Infiltrate Event

Projected Cost Involved in an Infiltrate Event During an Acute Care Hospitalization	Approximated dollar amount
Nursing Time ($30.00 average hourly rate x 4 hours) • Additional direct care giver time assessing site, elevating, consoling child, service recovery with family, discussing with MD • Additional nurse to assist with un-taping/re-taping • Restart of IV (can involve multiple nurses depending on difficulty involved) • Nurse manager follow up • Quality nurse review of event	$120.00
Material supply • IV catheter (s) • IV start kit • Tape • Transparent dressing/securement device • Antiseptic solution • T-connector • Dead-end cap • Normal saline flush • Topical analgesic for IV restart	$113.00
Physician time (1 hour) • Additional phone calls • Follow up visit after infiltrate event • Follow up by Medical Director of Quality and Safety on weekly safety rounds	$100.00
Extended length of stay/monitoring Additional 4 hours of acute care in-patient charge	$167.00
Total	$500.00

In order to sustain the positive gains generated from this quality improvement project, staff champions from each unit will continue to monitor compliance with project strategies and be the conduit for sharing information with the rest of the staff. Infiltrate events will continue to be reviewed to identify trends. Monthly infiltrate rates will be routed to nurse managers, staff champions, and the unit and team-shared decision-making councils for ongoing monitoring and decision-making. Infiltrate events will continue to be reviewed by the Medical Director of Quality and Safety and the Quality Nurse on weekly safety rounds. Parent responses from GetWellNetwork and general satisfaction comments will be used to monitor compliance with project strategies by the nurse managers on leader rounds.

Limitations

The limitations of this project relate to the generalizability of findings to other pediatric populations due to the limited sample. The ability to determine which strategy made the greatest impact was difficult because multiple strategies were implemented within the same time frame. The assessment survey was developed by the project leader and did not undergo reliability or validity testing. The scope of this quality improvement project did not allow for collection of

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Decreasing IV Infiltrates in the Pediatric Patient – System-Based Improvement Project

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Learning Outcome

After completing this learning activity, the learner will be able to describe the benefits of family engagement in patient care to decrease infiltrate events.

Fees — *Subscriber:* FREE ***Regular:*** $20

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This article was reviewed and formatted for contact hour credit by Rosemarie Marmion, MSN, RN-BC, NE-BC, Anthony J. Jannetti, Inc. Education Director.

demographic data to explore possible other confounding variables that influence infiltrate events.

Implications for Practice

As a nursing professional who is committed to improving health care, the nurse must be willing to challenge traditions and identify practices that produce less than optimal results. A structured methodical approach to improvement efforts is essential. Stakeholder involvement is critical to leading project activities and achieving positive outcomes. Improvement strategies must fit the organizational culture and align with the overarching strategic goals. Further, strategies must be grounded in evidence and translated into practice in a manner that is amendable for the bedside nurse if endorsement is going to occur.

The goal of this project was to decrease the rate of infiltrate occurrences and subsequently decrease harm in the pediatric acute care population. Using Lean Six Sigma methodology and evidence-based practice recommendations, and fully engaging the project team in the process, the impact to the target population was positive. By decreasing infiltration events, the quality of care improved, unwarranted costs limited, and value-added care processes increased. The project focused on involving the nurse and the family to improve the delivery of IV therapy in a manner that was safe, efficient, and patient-centered.

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