



Massachusetts Organization of Nurse Executives
Research Committee

Fall 2009 Posters

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Title: Evaluating the Hendrich Fall Risk Models and the Morse Fall Scale

Problem/Purpose

Patient falls are common, costly adverse event in acute care facilities and account for a significant portion of injuries. Reducing the risk of harm from patient falls in hospitals is one of the Joint Commission's National Patient Safety Goals (2009). The commission's implementation expectations require the establishment of a fall reduction program that ensure each patient is assessed for their risk for falling, actions are taken to reduce that risk, and an evaluation of the program's effectiveness. Based on the best available evidence, The Hendrich Fall Risk Models (HFRM) and the Morse Fall Scale (MFS) are recommended by national experts and consensus groups for identifying patients at risk for falls in the acute care setting. Although developmental studies support the predictive validity of these tools, only a few validation studies have been completed and most of these studies have not been conducted in the United States (US).

Literature Review

The understanding of both intrinsic and extrinsic risk factors has improved the ability to predict which patients are at the highest risk for falling, yet fall risk assessment tools still have not reached a high level of predictive validity. There are a number of published falls risk assessment tools that have been used in acute care settings. Recent reviews suggest fall risk assessment tools have been found to have relatively high estimates of sensitivity and specificity in the setting in which they were originally validated, yet the predictive validity has not been replicated in other acute care settings. Few tools were tested more than once or in more than one setting. When used in settings outside of the original population, the clinical utility of fall risk assessment tools may be limited. Although the American Geriatrics Society, Hartford Foundation, Joint Commission, ECRI Institute, and the VA National Center for Patient Safety promote the use of the HFRM or the MFS as empirically tested fall risk assessment tools, only a few studies have examined the diagnostic accuracy of these tools.

Research Question

The primary aim of this study was to evaluate the diagnostic accuracy of the HFRM, HFRM II, and MFS. A secondary aim of this study was to examine nurses' and researcher's ratings of fall risk and to compare the hospital fall rates using the HFRM and the HFRMII.

Framework

The Outcomes Model for Health Care Research served as the conceptual framework for this study. This model extends the work of Donabedian as it considers the interactions among the inputs, processes, and outcomes at the level of the client, provider, and setting.

Methodology

Research Design: A retrospective case-control design was used to evaluate the diagnostic accuracy of the fall risk instruments. A retrospective cohort study design was used to compare fall rates using the HFRM and the HFRM II.

Setting: This study was conducted in a large urban academic, research, and teaching hospital in the northeast. The hospital is a tertiary care and level 1 trauma center.

Sample: Eligible study subjects included all adult patients, with the exception of patients admitted to the psychiatric treatment unit, who had a documented fall between July 2004 and June 2006. The enrollment of patients occurred in two stages resulting in a purposive sample of 200 patients. A random sample of 100 patients who fell during the two study periods were selected and matched with a control patient who had to be of the same gender and receiving

care on the same unit as the faller on the day of the fall. Cases and controls were then paired on the closest match according to age, severity of illness, and primary medical diagnosis. All hospitalized patients were included in the sample examining fall rates.

Procedure:

This study was approved by the Institutional Review Board at our facility. Falls cases were identified using the institution's electronic Safety Reporting System. The controls were selected based on the best match according to the six criteria. The primary author reviewed all medical records and abstracted risk factors for the two HFRM and the MFS from the nursing admission assessment, the admission history and physical, interdisciplinary progress notes, and nursing flow sheets for the two 24 hour periods. HFRM and HFRM II risk factors and total scores were copied based on those assigned by the nurse when completing these fall risk assessment tools. If risk factor was identified at any time by a nurse for the 24 hours after admission and before the fall, it was included as present and the highest score was used in analyses. Two doctorally prepared nurses and one master's nursing student were trained in data collection procedures, yet due to poor interrater reliability, the primary author reviewed all patient records and rated risk factors for all three tools. Intrarater reliability was assessed for every tenth record, with at least 24 hours between rating periods, resulting in twenty records for examining the consistency of the rater over time. Fall rates per 1,000 patient days were abstracted from our electronic Safety Reporting System.

Data Analysis

Descriptive statistics were computed for all study variables, including frequencies, percentages, measures of central tendency, and measures of variability. A series of 2 x 2 contingency tables were used to examine the diagnostic accuracy of the three tools. Estimates of sensitivity, specificity, and accuracy were computed for all models using the cut off scores recommended by the developers of the risk assessment tools. A point estimate for the difference in fall rates and 95% confidence intervals were calculated to determine whether or not there was a statistically significant difference in falls rates using the HFRM and HFRM II. SPSS version 11.0 was used for data analysis.

Results

For the HFRM, sensitivity ranged from .38 to .74, specificity from .42 to .60, and accuracy from 42% to 65%. For the HFRM II, sensitivity ranged from .42 to .76, specificity from .48 to .58, and accuracy from 50.54% to 65%. For the MFS, sensitivity ranged from .76 to .82, specificity from .27 to .34, and accuracy from 54.5% to 55%. A comparison of the diagnostic accuracy of nurses' and researcher's ratings, for the two HFRMs, yielded consistently higher estimates of sensitivity and total predictive accuracy using the researcher's ratings. The mean fall rate per 1,000 patient days was 2.27 (SD=0.27) using the HFRM and 2.79 (SD = 0.47) using the HFRM II. The point estimate for the rate difference was 0.52 (95% CI = 0.29, 0.74) suggesting that there is a statistically significant difference between fall rates.

Conclusions

Although developmental and other evaluative studies support the predictive validity of the HFRMs and the MFS, the findings of this single site suggest there may be difficulties with their translation into practice. Bedside nurses' prospective ratings on admission and 24 hours before the fall indicate neither the HFRM or the HFRM II accurately predict which patients will fall. Relatively low estimates of sensitivity, specificity, and total predictive accuracy of the HFRM and the HFRM II on admission and before the fall suggest that these models are no better than chance alone at detecting true fallers. Estimates of diagnostic accuracy of the HFRMs were generally lower using nurses' ratings as compared to the researcher's ratings. Although causal

inferences cannot be made, study results indicate there was a significant increase in the fall rate after the HFRM II replaced the HFRM as the instrument for assessing fall risk.

Researcher's ratings on admission and 24 hours before the fall suggest that the MFS had a high estimate of sensitivity yet a very poor estimate of specificity yielding low estimates of total predictive accuracy. These data suggest although the MFS appears to perform well at identifying patients who are at true risk for falling and do experience a fall, it also classifies a large number of patients as being at high risk who do not fall. Overall results indicate that the MFS is also no better than chance alone at detecting true fallers mainly because it inaccurately identifies non-fallers as high risk. Results of this study suggest two risk factors, secondary medical diagnosis and administration of intravenous therapy, do not discriminate between patients who fall and those who do not.. These two risk factors seem to account for the high rate of false positive patients and the very poor specificity estimate. Almost all of the patients were rated as having these two risk factors, suggesting the presence of only one additional risk put most patients above the cutoff score.

Practice Implications

The correct classification of patients at risk for falls is paramount to ensuring high quality, cost effective health care that encompasses both the delivery of best practices and favorable patient and organizational outcomes. The accurate identification of an at-risk patient is central to the implementation of risk reduction interventions and ultimately the prevention of falls and falls with injury. If an organization's fall risk assessment tool is not accurate, misclassified patients who are truly at-risk will not receive preventative interventions, putting them at an even greater risk for falling and those who are not truly at-risk may receive unnecessary, sometimes resource intensive interventions. The accurate classification of falls risk is also fundamental to the examination of interventions aimed at reducing falls and falls with injury. In studies examining fall prevention strategies, the misclassification of patient may lead to erroneous study results which may in turn lead to the adoption of ineffective strategies that have no real effect on reducing falls and discarding ones that are beneficial. Health care organizations need to evaluate their fall risk reduction programs to ensure they are accurately identifying at-risk patients, otherwise patient safety may be compromised. Future research is critically needed to provide an evidence base to guide and inform best practices to prevent falls and falls with injury.

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- Deborah Morsi, PhD, RN, Baystate Medical Center

Exploring Patient Education Practice from a Multidisciplinary Perspective

- Purpose:** The purpose of the study was to explore current patient education practices and to determine the knowledge, use of, and applicability of existing patient education materials by Patient Care Services (PCS) clinicians.
- Background:** Many patient outcomes are directly related to their understanding of the treatment plan and their knowledge of self management. Whether patient education occurs and the quality of that education depends on staff knowledge of the education process and the use of available teaching materials. It is important that we understand to what degree clinicians are integrating patient education processes into their practice, and whether they are accessing and using existing patient education materials, in order to develop and implement improvement strategies to enhance patient education practice.
- Setting:** Academic medical center where over 3,000 PCS clinicians consisting of nurses, speech, physical, occupational, respiratory therapists, social workers and dietitians participated in the study.
- Method:** Utilizing Survey Monkey software, the organization's Patient Education Committee designed and implemented a cross-sectional survey that was emailed to PCS Directors who then forwarded it to study participants. Using a 4 point Likert scale and open ended questions, clinicians were asked 26 questions about their patient education practice in the areas of assessment, planning, intervention, evaluation, documentation and confidence in teaching. Each question was scaled based on a range from always to never or extremely to not at all. The 2 open ended questions asked clinicians "What can we do to make patient education easier for you" and "List any additional patient education resources you would like available at MGH."
- Results:** A total of 568 clinicians completed the survey. Seventy percent of the responders worked within the in-patient setting. There were 439 from a potential of 2,903 nurses who responded, a 15% response rate. The response rates from other disciplines are as follows: OT-42%, RD-44%, PT-25%, SW-50%, SP-20%, RT-22%. Each age group was represented evenly with the exception of greater than 60 years being only 4%. Speech therapists and dieticians always used a computer to access patient education materials 50% of the time, whereas all other disciplines used it less than 25% of the time. It was notable that 59% routinely assessed patient learning needs and considered patient's culture when teaching. Thirty-eight percent assessed patients' preferred learning style and 48% included the family in patient teaching. An average of 58% of clinicians had knowledge of and used 3 primary electronic patient education resources that included CareNotes (MicroMedex licensed database), MedlinePlus (National Institute of Health website), and internally produced patient education documents. Overall, about 40% of clinicians surveyed did not know about or use electronic resources provided for patient education. Approximately 90% of clinicians surveyed did not use patient education videos available on the hospital patient education television system. Ninety-nine percent of those surveyed stated that they had confidence in teaching patients. The qualitative data from the 2 open ended questions yielded 303 responses providing tremendous information on what clinicians need to make patient education easier in their

respective practices. Staff asked for easier access to online patient education resources as well as training on how to use the resources.

Implications: The survey identified key areas of patient education practice that clinicians of all disciplines need to improve upon. In particular, improvement was needed in clinicians' knowledge of and use of patient education resources in both electronic and video format. The Patient Education Committee will utilize the data to develop and implement a comprehensive plan that will include clinician training, and simplifying the process to access patient education resources. Patient education is a critical component of any clinician's practice. Having knowledge of practice in this arena is invaluable when designing and implementing systems, processes and programs that will ultimately impact clinical outcomes for patients.

- Taryn J. Pittman, MSN, RN-BC, Massachusetts General Hospital
- Judy Gullage, BSN, RN, Massachusetts General Hospital

Heart Failure: Education Is Key in the Safe Transition from Hospital to Home and in Decreasing Readmission Rates.

Purpose: The purpose of our performance improvement project was based on a desire to see how well our Heart Failure patients were doing after discharge and to identify areas that needed to be addressed prior to discharge that would improve the transition from hospital to home, and once home, facilitate a successful recovery.

Setting/Background/Population: Hallmark Health is a community-based health care system, comprised of two acute care facilities with multiple out patient services. In 2006, Hallmark Health's thirty- day readmission rate for patients with a primary or secondary diagnosis for heart failure was 39%! Given the high readmission rate and the fact that we provide care to a large number of older individuals, at risk for cardiac problems, we recognized this was an area of concern and opportunity.

Methodology/Process: Based on the findings of the chart audits, hospital leadership worked with staff and challenged them to identify the root causes for our readmission rate. A Chronic Heart Failure (CHF) Committee was formed. Retrospective chart reviews were done and nurse interviews were conducted with the intent of providing some insights and direction to address the problem. Two important findings emerged. First, there was no consistent, formalized process for patient education; and second, interviews with the nursing staff revealed a knowledge deficit about the disease and best care practices.

A CHF Nursing Team was recruited from a pool of nursing staff. They became the 'expert' CHF resources for nurses and champions for patient education. A two part, CHF educational program was developed by this group for the staff nurse. Part one addressed basic physiology and the pathology of CHF. A review of the best practices for managing HF in the acute setting was an integral part of this educational initiative, and every nurse was given the tools necessary to be comfortable teaching and answering questions about this disease. The second part of the education program focused on what nurses need to teach patients. A new and improved HF Patient Teaching Booklet was also developed to support this teaching, and to be a resource to patients and families once discharged, encouraging them to be the gatekeepers of their own health and well-being.

The CHF Nursing Team also reviewed our delivery of care processes and developed a reliable, formalized process to provide patient education. The process now starts at the time of admission and continues throughout the hospital stay. There are multiple and varied reminders for nurses to make education an integral part of direct care, documenting what has been discussed and communicating follow up educational needs during handoffs. A HF checklist was developed to facilitate this process. Once a nurse has discussed one content area with a patient, she would check it off so the next nurse could continue with the next phase of education.

Some patients needed visual and repetitive education. A canned text program for HF patients is now on the hospital TV twice a day. This approach is used if the nurse felt a patient needed more reinforcement. Families were also included in the educational process to provide support, guidance and reinforcement to loved ones, and to become our partners in this commitment for improved management.

Throughout the past two years we have reached out to the communities we serve. Our educational materials are now in seven languages to reflect our patient population and

demographics. They are now available on our web site, in physicians' offices and disseminated at community events and health fairs. We have also developed 'seasonal themes' to refresh nurses' commitment to the educational process and to help individuals with CHF folks during challenging times. For example "Let's keep them Home for the Holidays" is released every October, to help with holiday eating and every June, we release "Barbeque Tips, No Chips for You" to assist with summer fluid and diet needs.

Collaboration and communication with peers and physician colleagues was also part of our performance improvement plan. We have sent our physicians the latest guidelines for heart failure management from AHA and the "Get with the Program" materials. Educational reminders are placed in mailboxes and mailed to offices every six months. The Quality Resources department monitored charts and any caregiver out of compliance received a kind reminder for future improved care. HF reminders were placed on the nursing units and in physician areas of the hospital. All physicians and nurses received a laminated (pocket sized) card with all the guidelines on doctor's day and nurse's day respectively.

As we continued our performance improvement efforts, we discovered in an audit in 2008, that 50% of our discharged HF patients did not qualify for VNA services. We developed a program in our outpatient department to fill this gap. In addition, a CHF Home Management Program was incorporated into our current cardiac rehabilitation program. At discharge, the patient is invited for three free scheduled classes for continued development of management skills. We purchased easy to read scales and measuring cups given free to the patient. The scales and measuring cups are also available for any inpatients that the staff identifies need them. If the patient is discharged to VNA, they can be referred to this program at VNA discharge to continue supporting life style changes. Physicians in their offices can refer the patient for this education in an effort to avoid admissions.

As our outreach developed, we realized our professional partners might have the same needs as we did. We began "Partnering with Our Professional Receivers". The CHF Nursing Team called our local nursing homes and rehabilitation centers to offer our CHF program. The goal is to help with their educational needs and give them the tools to improve their CHF management.

Outcome Measures/Results: In 2008, our thirty- day readmission rates decreased from 39% in 2006 to 22% in 2008! We were able to disband our formal CHF Committee and the CHF Nursing Team has achieved a new level of independence and commitment to keep the ball rolling, and working with our quality control resources to keep nurses motivated, actively problem solving and fostering up to date evidence-based practices.

Practice Implications: Where do we go now? Where ever a CHF patient's needs drive us. Research has shown that patients who continue to have contact with nurses do better maintaining their life style changes. We also know that addressing the needs of CHF patients and families requires continuing education, reinforcement, commitment, creativity, monitoring, vigilance, collaboration and receptivity to incorporating best practices into the care model. Most of the performance improvement changes in this presentation were directed and delivered by nurses.

- Barbara Marullo, BSN, RN, Hallmark Health System

Performance Improvement Abstract Checklist

Organizational Approval from:

Name: Deborah Baker

Title: Vice President for Patient Care Services

Title: Improving Skin Care Outcomes using NDNQI Data

Purpose:

The purpose of the skin care outcome project was to reduce the incidence of hospital acquired skin breakdown on a Medical-Surgical Telemetry Unit. Data acquired from the National Data of Nursing Quality Indicators (NDNQI) Pressure Ulcer Prevalence Study identified the medical-surgical telemetry unit as an outlier. This unit was opened in the Spring of 2006 and was equipped with the most up to date bed surfaces. After review of the NDNQI data we needed to understand what were the contributing factors to a new unit with specialized mattresses having such a high incidence of pressure ulcerations.

Background:

The prevalence of hospital acquired pressure ulcers in acute care ranges from 3.5% to 29.5% annual average. It is estimated that \$3.6 billion per year of the national burden can be attributed to the cost of medical care of pressure ulcers. On average a Stage 2-pressure ulcer costs \$1,100 and a Stage 3 and 4-pressure ulcer may cost up to nine times greater than a Stage 2-pressure ulcer. In addition to these costs, in October 2008 Medicare stated that they would no longer pay for hospital acquired pressure ulcers.

Pressure Ulcer prevention is a priority at Mount Auburn Hospital. Mount Auburn Hospital participates in NDNQI (National Database for Nursing Quality Outcomes) and has been analyzing and utilizing the data from NDNQI to improve patient outcomes.

The pressure ulcer prevalence study is performed quarterly on all inpatients at Mount Auburn Hospital. The following data is collected on every inpatient: Age, length of stay, braden score and time of last braden score. When any stage pressure ulcer is identified, the chart is reviewed to determine whether it was hospital acquired. If patients are determined to be at risk, their charts are also reviewed for evidence of skin breakdown prevention interventions.

The data from the fourth quarter of 2007 and the first quarter of 2008 demonstrated that one of the medical surgical telemetry units had a higher incident than any other similar units.

Setting/Population:

Mount Auburn Hospital is a 191 bed Harvard community-based teaching hospital that services Cambridge, MA and the surrounding area. Of note, based on our NDNQI data our patient population is on average between 6 and 10 years older than hospitals of similar size in the NDNQI database. All inpatient units are included in the pressure ulcer prevalence study; however our analysis and interventions were focused on the unit with the highest prevalence.

This unit is a 24-bed medical surgical telemetry unit and offers continuous O2 saturation monitoring. While interventions were piloted on this unit, once they were determined to be successful these interventions were carried out on all other units.

Methodology/Process:

The unit opened three years ago with new mattress surfaces that offered pressure reduction. These state of the art mattresses were designed to promote patient comfort and skin integrity. Upon further investigation of the mattresses, we determined that the new mattresses needed to be refilled with air on a routine basis. This had not been done.

The first intervention was to place the mattresses on a quarterly refilling maintenance schedule. Then we discovered that the patients on this unit were being scored at a lower risk than the national average by the Braden scoring system. After further investigation these patients were high risk for skin breakdown. At this time we created an in-service program to educate the nursing staff on assessing and scoring the Braden Scale.

After completion of the in-services, the second quarter of 2008's data demonstrated that the Braden Scale scores were more accurate but the percent of patients determined to be at risk was still lower than we expected.

NDNQI then established that a score of 18 and under would identify the patient to be high risk for skin breakdown. At that time our score for determining if a patient is high risk for Skin Breakdown was 12. This meant that we were identifying and placing only the highest risk patients on the skin care plan protocol.

We then revised our skin care and pressure ulcer prevention policy and practice to identify patients at risk for skin breakdown earlier by changing Braden score to 18 and below. This was a hospital wide intervention.

We used the following two quarters of pressure ulcer prevalence study results to evaluate the effectiveness of our interventions.

Outcome Measures:

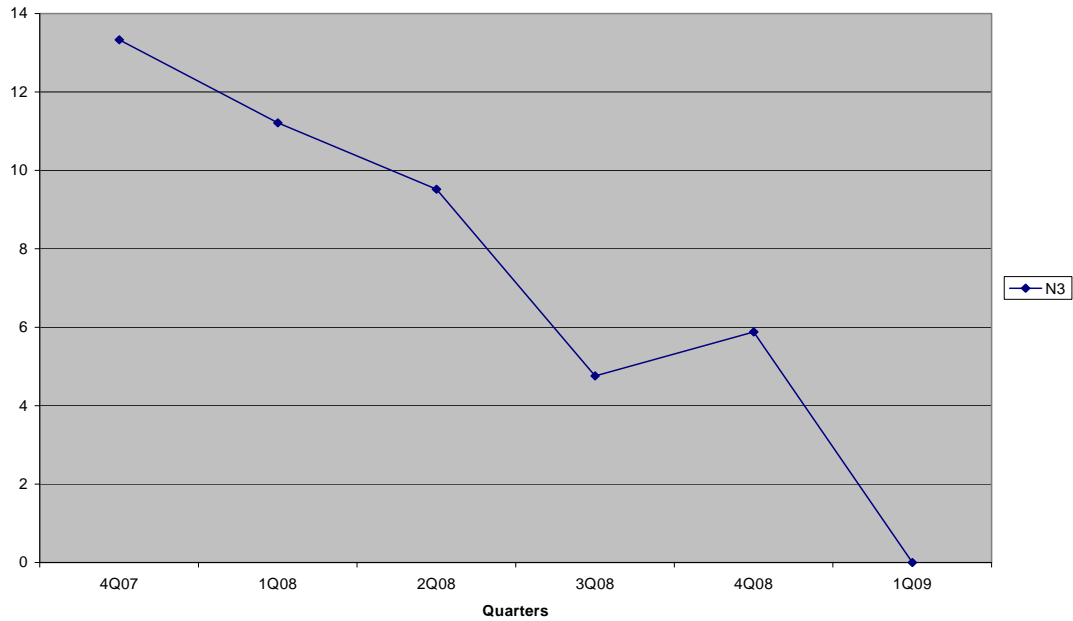
Through the use of data we identified that patients were being scored accurately, however we were not capturing all the high risk patients. This was corrected with education. Adjusting our scoring to include all patients with a Braden Score of 18 or below expanded the patient population who were being treated as high risk for skin breakdown.

These interventions have had a major impact in lowering our hospital acquired skin breakdown percentages.

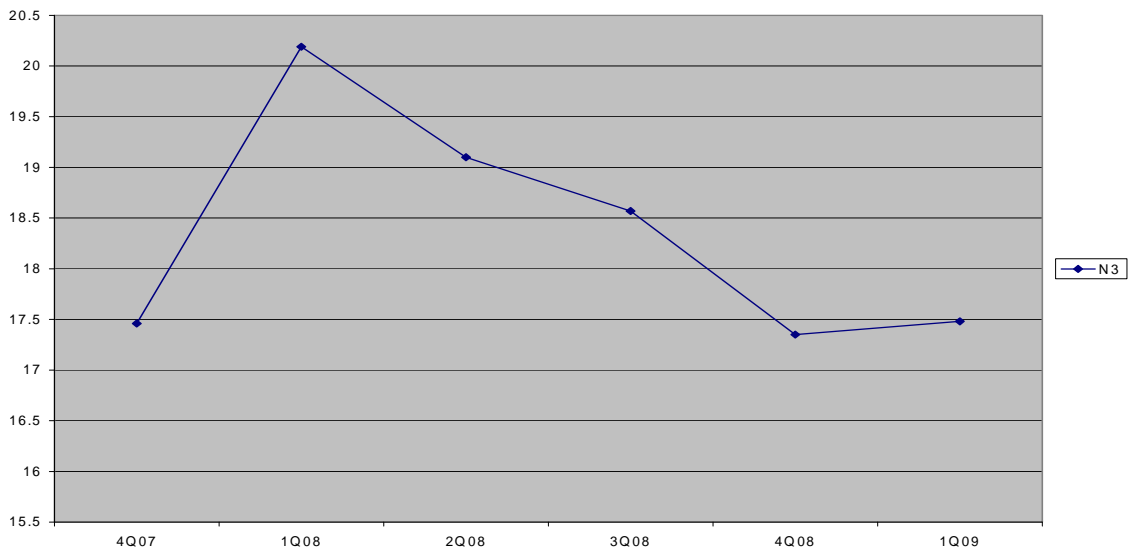
Practice implications. Adjusting the Braden score skin breakdown risk allowed Mount Auburn to identify and provide prevention interventions to a larger pool of patients at risk for skin breakdown; therefore we are able to implement prevention strategies earlier. A byproduct of this project is that we strengthened documentation of interventions, such as repositioning, nutrition consults, and redistribution surfaces.

This project illustrates that data can be used as a guide to identify and evaluate opportunities for improvement in patient care.

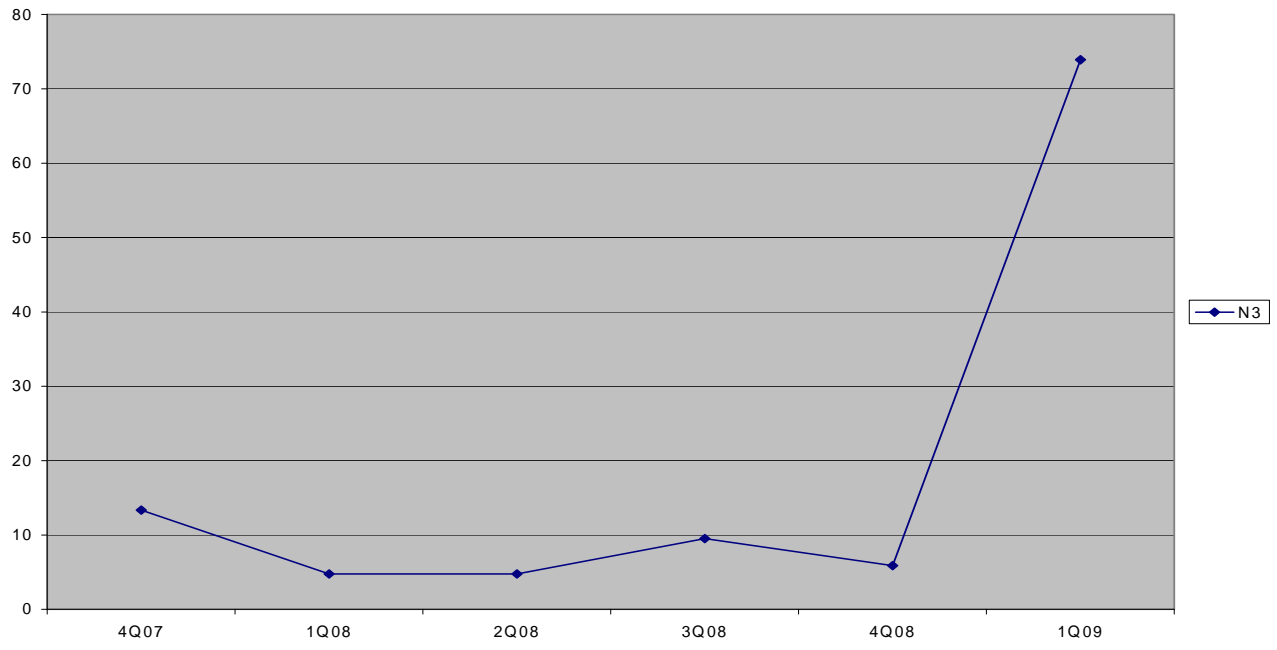
N3 Percent of Hospital Acquired Pressure Ulcers



N3 Mean Braden Scores



N3 Percent of Patients deemed at Risk for Pressure Ulcers



Title	Multidisciplinary Teamwork to Implement Infection Control Measures to Control Spread of Clostridium difficile Infection (CDI)
Purpose	To analyze cases of CDI diagnosed in 2008, the nursing units where they occurred, patient risk factors and prevention and control measures on the healthcare acquired CDI rate by patient days.
Background	Clostridium difficile is an anaerobic, spore-forming bacillus that is responsible for a spectrum of C. difficile infection (CDI), including uncomplicated diarrhea, pseudomembranous colitis, and toxic megacolon, which can, in some instances, lead to sepsis and even death. CDI is most frequently associated with previous antibiotic use and is most commonly contracted by the elderly and those with recent exposure to hospitals, nursing homes and other healthcare institutions. It is transmitted by hand contact with items contaminated by feces. In the last five years, a more virulent and antibiotic-resistant strain has developed which has been associated with more serious disease, treatment failures and deaths. In June 2008, the Centers for Disease Control (CDC) published new surveillance definitions for CDI. A multidisciplinary team was formed to address an increase in healthcare acquired CDI, especially on one medical nursing unit. A medical record review of CDI cases was conducted and infection control measures implemented.
Setting/Population	The population under study was medical and surgical patients in an acute care institution. The nursing unit where increased rates of CDI were observed was primarily a medical/telemetry unit with a high proportion of patients who were elderly and admitted from extended care facilities.
Methodology/Process	The team included representatives from infection control, nursing, microbiology laboratory, gastroenterology, surgery and environmental services. In August 2008 the hospital contracted with a company that uses a room decontamination dri-mist system deploying a quaternary ammonium disinfectant (QD). It has EPA approval for C.difficile spore efficacy. Nineteen rooms on the affected nursing unit were decontaminated over a 3 day period. In addition, environmental services instituted the use of germicidal bleach wipes for all precaution isolation rooms. To prevent transmission during transfers a new policy was implemented that required patients be transferred on stretchers or wheelchairs, not their hospital bed. All CDI cases were on special contact precautions for the length of hospitalization and staff received education on CDI. The team developed a data collection tool and reviewed 32 medical records and classified them according to the new CDC definitions and analyzed risk factors in the infected patients. (Two records were no available for review).
Outcome Measures/Results	In FY2008, There were 34 CDI infections in 28,914 patient days with a rate of 1.17. 21 (62%) were healthcare associated with a rate of 0.7/1000 patient days. 13 of the 21 (62%) occurred during hospitalization and 8 (38%) occurred within four weeks of discharge. The remaining 13 cases were community onset. One nursing unit cared for 17 of the 34 CDI patients and 12 were healthcare acquired

	<p>(71%). Risk factors in the CDI patients included: 23 (67%) proton pump inhibitors, 12 (35%) cancer, 9 (26%) fluorquinolones, 9 (26%) obese, 6 (18%) CT scan before onset, 5 (15%) MRSA colonization, 3 (9%) VRE colonization and 3 (9%) diabetes. During the first six months of FY2009, there were 11 CDI with a rate of 0.9/11,658 patient days. 8 of the 11 CDI were healthcare associated (73%), Only 3 (37.5%) occurred on the original nursing unit under investigation. We continue to monitor the rate of CDI and implemented control measures through rounds and collaborative teamwork to reduce the healthcare associated rate.</p>
<p>Practice Implications</p>	<p>Over a six month period, we have achieved a reduction in CDI that were healthcare associated after implementing prevention and control measures. We incorporated the use of a room decontamination dri-mist system, cleaning environmental surfaces and equipment with germicidal bleach wipes, and heightened education. This suggests that patient-to-patient and environmental spread may be a more important cause of increased CDI rates. Further surveillance throughout the remaining fiscal year will determine if these measures were successful in reducing the rate further. Multidisciplinary teamwork with physicians, nurses and ancillary departments is important in infection control and prevention. Analyzing CDI with the new CDC case definitions, establishing rates by patient days and by nursing units helps the team to focus their efforts and prevention transmission.</p>

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- Maureen Spencer, RN, M.Ed., New England Baptist Hospital
- Susan Cohen, MT (ASCP), New England Baptist Hospital
- Thomas Liu, MD, New England Baptist Hospital
- Stephen Camer, MD, New England Baptist Hospital
- Susan Davidson, MD, New England Baptist Hospital
- John McAllister, New England Baptist Hospital
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Title: Nursing Improves Orthopaedic Care Delivery In The Community Hospital Setting

Purpose: The purpose of this performance improvement initiative was to show how Hallmark Health System (HHS), 370 bed, community –based hospital system, north of Boston, Massachusetts, utilized the expertise of a skilled nurse to provide a best practice program for bone and joint patients. Just a little over two years old and using an interdisciplinary team approach, the Bone & Joint Program at Hallmark Health is already returning dividends in patient satisfaction, quality measures, and in the hospital's bottom line. The face of joint replacement surgery is changing quickly. An aging, more active population, combined with technological advances in orthopaedic devices and care, has resulted in a growing number of physicians recommending joint replacement surgery as a proactive intervention and not one of last resort for those with debilitating joint disease. Given the current trend and the anticipated increase in surgical volume associated with it, the need for an evidence-based, comprehensive, and well coordinated Bone & Joint Program to provide patients and their families with the highest quality of care was clear.

Background, Setting and Population: According to the National Center for Health Statistics and the Centers for Disease Control, more than 638,000 hip and knee replacements were done in the US in 2003. The Agency for Healthcare Research and Quality (AHRQ) reported more than 3.4 million orthopaedic procedures were performed in US hospitals in 2005, representing 8.6% of all hospital discharges, with estimated expenditures for musculoskeletal procedures representing more than 10% of total hospital revenues, or \$31.5 billion dollars.

Although a number of factors including loss of flexibility and motion, incapacitating pain and an inability to perform activities of daily living contribute to the need for hip and knee replacements, aging plays a significant role in the development of these factors.

In 2005, 285,000 total hip replacements and 523,000 total knee replacements were performed in the U.S. By 2030, these two procedures are expected to jump to 572,000 and 3.4 million respectively (American Academy of Orthopaedic Surgeons, 2005). In 2000, 34.5% of the population in the US was 45 years or older. By 2020, census statisticians predict these baby boomers will increase to 41.0 % (US Census Bureau, 2004). The graying of America combined with the technological and product line advances in orthopaedics, will continue to drive the need, and ultimately, drive the demand for quality orthopaedic care.

Methodology/Process: The Bone & Joint Program Coordinator (a nurse) look at the need (a growing population) for Total Joint Replacement and saw it as a growth opportunity for an Orthopaedic Service Line. We then looked at the fiscal impact of shortening Length of Stays and preventing infections. Nursing obtained a list of all potential community service areas in which to provide education and outreach surrounding "Joint Pain Prevention and Treatment" and delivered over 100 lectures over a two year period. We also engaged physicians, pharmacists, and rehab staff in this process. Nursing organized events and solicited vendor support for fundraising to provide educational material and promotional items i.e. pens, recycle bags, sunscreen at our lecture series. Nursing looked at "Population Based" care and opened an Orthopaedic Unit. Prior to the opening, the Coordinator was certified by NAON (National Association of Orthopaedic Nurses and she provided competency training to over 85 nurses and ancillary support staff for the unit. Finally, nursing wrote for and received grant funding to begin an Osteoporosis Outreach and Education program and has purchased a portable GE heel scanner to provide such a program. We have also partnered with vendors and the National Dairy Council to assist with education.

Outcome Measures: Community Outreach (nurse led) to drive orthopaedic volumes – we looked at our current volume and realized that we could increase it with community education. That said, year one we increased by 8% and year 2 we increased by 19%. Nursing developed and implemented a pre-op education session called “Joint Camp” and we developed a “Joint Journal” for patients. 100% of all total arthroplasty patients attend this session. – The measurable outcome of this initiative is our LOS decreased from 5.1 to 3.7 days. The group developed and implemented nursing protocols and standardized physician order sets for the total arthroplasty patient thus also contributing to shortened LOS and increased quality data i.e. decreased VTE, increased ROM, decreased post op ileus, pneumonia, and catheter associated infections. We developed a multidisciplinary team approach that has allowed us to increase the amount of patients that are discharged directly home from 10% to 41.6% thus avoiding short-term rehab stays. We MRSA screen all total arthroplasty patients preop thus resulting in a 0% post op infection rate over a 2-year period. We also implemented a zero tolerance policy in the OR for entry and exit from the OR suite during surgery. We have had 99% success with hand washing on nursing unit with education and addition of multiple foam dispensers. Our Program has increased revenue to the system and have actively organized fundraising and grant application successes to help fund our project. We have been invited to submit an RFI to BC/BS to become a “Center for Distinction for Hip and Knee Surgery” and the RFI has been submitted as of 7-24-09. We have cared for over 500 patients in a two year period using our methodology.

Practice Implications: In looking at the need as mentioned in the abstract and based upon some of the measures mentioned, nursing has been extremely engaged and successful in driving volume to the system in a time when elective surgeries have been effected by the economy and we have garnered physician engagement at the table to implement and monitor standardized care plans and orders sets. We have shortened length of stay, set benchmarks for quality measures, made patients better consumers and participants in their own care and collaborated with interdisciplinary teams to increase revenue streams and decrease expenses while managing to decrease infection rates/surgical complications and increase range of motion and get quicker returns to mobility.

Recommendations:

- Community Outreach is essential
- Robust Patient Education preoperatively
- Multidisciplinary collaboration
- Standardized order sets and nursing care pathways
- One on one patient communication upon discharge to increase patient satisfaction
- National Specialty Certification
- Rapid Recovery Program development

- Deborah L Cronin-Waelde, RN, OCN, Hallmark Health System

Reducing Patient Falls: Successfully Adapting Evidenced Based Tools and Technologies in a Long Term Acute Care Facility (LTACH)

Purpose

New England Sinai Hospital clinicians and administrators view fall safety as a strategic priority. The development and implementation of the fall reduction initiatives put in place by the Falls Committee have involved all Sinai colleagues, creating an environment where fall prevention is “owned” by all clinical and non-clinical employees.

The specific aim of the fall reduction performance improvement initiative is to reduce the number and incidence of patient falls and falls with injury by; (1) identifying an evidence-based fall risk screening tool appropriate for use in a long term acute care facility, (2) building a multidimensional, multidisciplinary fall prevention program using the tool as the foundational element and (3) evaluating the effectiveness of the program strategies on a quarterly basis and revising or enhancing the program based on performance/outcomes data.

Background

Falls and falls with injury are the most commonly reported incidents/events in the hospital setting. Statistics from The Center for Disease Control and Prevention indicate that one in three adults over the age of 65 fall each year and 10% or more of those falls occur in the hospital setting (IHI, 2005). Healthcare organizations, following regulatory and certifying body recommendations, implement strategies to reduce the risk of patient falls. The facilities’ challenge is in designing or *customizing* a fall reduction program to meet the unique needs of their patient-specific population. Falls prevention research done to date has provided some direction (screening tools and strategies) for program building, but few of the tools developed have been tested within and across multiple patient care settings (V. Scott et al., 1997). Clinicians in unique environments may not have the benefit of valid, reliable testing and outcomes to guide their decision-making process. Instead, they adapt best practice tools currently in use elsewhere to fit their objectives and steer changes in their own practice. The responsibility of determining what works in a specific setting falls to the organization.

Setting/Population

New England Sinai Hospital is a 212 bed, long term acute care (LTACH) hospital with a diverse patient population covering three campuses (main campus and two satellite units in two host hospitals). The hospital is recognized as a regional leader in pulmonary and complex medical rehabilitative care. The majority of patients experience a debilitating level of respiratory compromise and require a prolonged hospital stay. Overall, patients range in age from 17 to 100 with the average age of 70. Their admitting diagnoses include multisystem and complex medical and post-operative disease states. Co-morbidities, prolonged hospitalization, rehabilitation efforts and poly-pharmacy, combined with other factors such as age, neurological deficits and location change(s), increases the risk of falling in this large segment of inpatients.

The organization integrates state of the art technological tools to facilitate positive patient outcomes; hi fidelity ventilators for ventilator-dependent patients, bedside medication verification system (BMV), electronic documentation and medication administration records, bed alarms, safe patient handling and movement aides, population-specific beds and advanced wound healing therapy devices.

Methodology/Process

New England Sinai’s Fall Reduction Program is dynamic and the committee’s work has been moving toward an evidence base for over three years. Prior to January 2006, patients deemed at risk for fall (defined as confused, impulsive and/or fails to follow safety precautions) were placed on a paper “Fall Prevention Protocol.” The interventions became increasingly more restrictive with an increase in the perceived risk of fall and were primarily equipment based

Reducing Patient Falls: Successfully Adapting Evidenced Based Tools and Technologies in a Long Term Acute Care Facility (LTACH)

(specialty beds, alarms, restraints) - with a written edict to never leave a patient unattended if the protocol was in place. The evidence-based Morse Fall Scale (Morse 1997) was introduced in November 2006 to assess the risk of fall for each patient on admission and following a fall episode - as a fall reassessment tool. The paper process continued to be redefined as a reactionary response to individual, adverse events until January 2007 (Q1 '07 fall rate, 2.49/1000 patient days- SPMS/ORYX National LTACH Benchmark 3.47/1000 patient days) when the Morse Fall Risk Assessment (MFRA) tool became a standard of care and was completed for each patient on admission and every week. This practice change was supported/preceded by education and by embedding the MFRA in the electronic documentation (Meditech) flow sheet as a nursing intervention. The Falls Committee began an aggressive fall reduction campaign in May 2007 following a sharp spike in the April 2007 fall rate to 4.7.

In April of 2007 there was a noted rise in the fall rate (4.7) which prompted a change in the incident reporting system to enhance the assessment and documentation related to fall episodes. House wide nursing education on fall prevention ran from May through September 2007. The hospital also purchased an additional 10 specialty beds from Carroll Healthcare (Model "ARRO"). After the fall/fall prevention education was completed the MFRA frequency was changed from weekly to every evening at 8PM (Q3 '07 fall rate 3.45/1000 patient days) (Anecdotally, this time frame is associated with the time that a patient is most likely to fall). Concurrently an auto flagging/assessment reminder system was added to the electronic documentation system. In January 2008 (Q1 '08 fall rate, 2.98/1000 patient days) the hospital piloted new bed alarms/restraints on the Rehabilitative Care unit and then implemented them house wide. The MFRA tool was refined again in April 2008 (Q2 '08 fall rate 1.19/1000 patient days) to be more reflective of Sinai's unique patient population, most notably, the patients with rehabilitation needs who are frequently tethered to some type of tubing placing them at higher risk for fall. In August 2008 the Q3 '08 fall rate was 2.17/1000 patient days and the incident reporting system was updated to increase data points per fall and the hospital reviewed/revise the 1:1 Patient Sitter Policy. The Fall Safety Committee recommended that all patients be placed on "fall caution" intervention for the first 24 hours after admission due to Sinai evidence that a large number of patients fell in the first 24 hours after admission. This change was implemented in February 2009 (Q1 '09 fall rate 1.61/1000 patient days).

An Hourly Rounding initiative was formally implemented in March 2009 (Q1 '09 fall rate 1.61/1000 patient days). Patients are asked about their level of pain, positioning, placement of items within reach and personal needs/toileting. Nursing leaders are now collecting/correlation information between hourly rounding and fall rates using a monthly tracer methodology assessment tool and weekly hourly rounding surveys (3 patients per week by all nursing leaders). Additional education and reinforcement of the importance of fall prevention and the use of the MFRA Tool took place in August 2009.

The falls data is gathered and reviewed monthly by the multidisciplinary falls committee and includes reported patient falls at all three New England Sinai campuses. The information is then shared in several forums including the Quality Management monthly meetings (attended by department heads throughout the hospital), nursing department leadership and unit staff meetings. The importance of fall risk reduction is also discussed during hospital and nursing orientation. Proposed changes or enhancements to the falls program are vetted back up through the Falls Committee. Further education and/or the purchase of additional safety tools are done within each clinical discipline and are based on outcomes data.

Outcome Measures/Results

The organization's commitment to tailoring the MFRA tool to make it Sinai-specific and to then implement and evaluate new recommendations in a timely manner – whether it is the purchase

Reducing Patient Falls: Successfully Adapting Evidenced Based Tools and Technologies in a Long Term Acute Care Facility (LTACH)

of new equipment or enhancements to the electronic documentation system – have been the most significant interventions in supporting practice change and fall reduction. The proactive and collaborative effort of the Falls Committee has led to a reduction in the number of falls- which has consistently remained below benchmark**:

<i>Date</i>	<i>Average Fall Rate per Quarter*</i>	<i>SPMS/ORYX- National LTACH Benchmark**</i>
January 2006	2.72	3.47
May 2009	1.55	3.25

*Average number of Falls per 1000 Patient Days

** SPMS – Specialty Performance Measuring System –National database tool for LTACH data and ORYX

The addition of other evidence-based tools including Hourly Rounding (Meade, CM et al., 2006) is also expected to reduce the risk of falls.

Practice Implications

NE Sinai's quarterly fall rate remains lower than the national average and has dropped by 22% over three years. Recommendations to other organizations to reduce fall rates;

- Maintain a multidisciplinary “ownership” of the fall program
 - Leverage electronic tools and reporting systems to support initiatives
 - Communicate, communicate and communicate your findings
-
- Jean Ivil, BSN, RN, RRT, New England Sinai Hospital
 - Paula Picard, BSN, RN, New England Sinai Hospital

Title: Ultrasound Guidance: Setting The Standard for Bedside Placement of Peripherally Inserted Central Catheters (PICCs).

Purpose: The purpose of this performance improvement project was to explore the use of ultrasound guidance to insert PICCs at the bedside in an acute rehabilitation hospital. The goals of the project were to: increase the success rate for placement of PICCs at the bedside, optimize patient outcomes, and decrease or eliminate the cost of transferring patients to an acute care hospital for Interventional Radiology (I.R.).

Background: Peripherally Inserted Central Catheters (PICCs) have traditionally been inserted into the superficial veins of the antecubital region using palpation to guide the procedure. Despite advances in access techniques, it is often difficult to place a PICC in these veins as they may easily be damaged through frequent venipuncture for peripheral IV insertion and lab specimens. In addition, because the veins in the antecubital region are small in diameter, this area is not considered an optimal location for PICC placement due to the risk of thrombus formation as a result of venous stasis. Excessive catheter movement related to antecubital PICC placement, such as that associated with physical therapy to the upper extremities may also result in increased mechanical phlebitis, catheter-related bloodstream infections, and irritation of the intimal lining of the vein stimulating the thrombotic cascade. Ultrasound guidance however, allows the clinician to access the veins of the upper arm thus avoiding these risks.

According to records kept by the hospital's infusion therapy service between 2004- 2005, approximately 15% of all PICC insertion consults ordered at our acute rehabilitation hospital could not be successfully inserted at the bedside. As a consequence, these patients were transferred by ambulance to an acute care hospital to the I.R. service where more advanced techniques and technology could be utilized to achieve a successful insertion. The total cost to the hospital for a single unsuccessful bedside insertion, ambulance transportation, and I.R. insertion was \$3,060.60, although because the hospital is part of a larger system, the cost was reduced to \$949.03 when I.R. was performed at an affiliated hospital.

Setting / Population:

Setting: This project was conducted in a 180-bed acute rehabilitation hospital.

Population: All inpatients ordered for PICC insertion from December 2006 through June 2009.

Sample Size: n = 258

Methodology / Process: PICC insertion records from January 2004 through December 31st, 2005 were examined. 179 PICC insertions were ordered during this time and traditional access techniques were used. The overall success rate at the bedside was 85.4%. 26 of 179 bedside insertions were unsuccessful and required referral to I.R. where fluoroscopy and ultrasound guidance were used to successfully insert the PICC. In April 2006, two 30-day trials of bedside ultrasound guidance for PICC insertions were conducted. 100% of the 28 PICCs attempted during the trial periods were placed successfully. 9 of the 28 PICCs inserted were potential I.R. candidates. The cost savings for inserting these 9 PICCs at the bedside instead of referring them to I.R. was estimated at \$7,656.03. 6 of the 28 PICCs inserted with ultrasound had been unsuccessfully attempted prior to the trial without ultrasound. 5 of these 6 patients could not be referred to I.R. because they were classified as high-risk transfers. An ultrasound investment analysis was performed which demonstrated the cost to the hospital for an estimated 26 transfers to I.R. per year to be \$24,674.78 annually with a projected 5 year cost of \$123,373.90, and a net savings of zero (0). The capital purchase of the ultrasound machine was \$13,900. A return on investment report was calculated which predicted a significant cost savings to the hospital based on a conservative success rate of 80% with the 26 anticipated I.R. candidates. A

vascular access ultrasound machine was purchased and the infusion therapy nurse underwent training in its use. Ultrasound guidance for PICC insertion was implemented in December 2006. From December 2006 through June 2009, all PICC insertions (n=258) were attempted using ultrasound guidance.

Outcome Measures / Results: From December 2006 through June 2009, 256 PICCs were successfully inserted out of the 258 which were ordered, this was a post-ultrasound implementation success rate of 99.2%. 5 of these PICCs were not inserted on the first attempt. 3 of these 5 attempts were repeated the following day and successfully inserted in the opposite extremity. During the past 2.5 years, a total of 44 patients who had PICCs inserted were classified as likely I.R. candidates prior to the routine use of ultrasound guidance. These figures were used to calculate an estimated total cost savings of \$37,429.48 over a 30-month period. A significant limitation of the project was that PICC insertion without ultrasound guidance was never actually attempted on the 44 patients classified as potential I.R. candidates so that the test of change was based on theoretical rather than actual data. The project was also dependent on the presence of a licensed nurse who is competent with ultrasound guidance.

Practice Implications:

The Infusion Nurses Society and the Association of Vascular Access recommend that ultrasound guidance become the national standard for placement of PICCs at the bedside. The data from this project fully support their recommendations. The adoption of ultrasound guidance dramatically increased the success rate for PICC insertion from 85.4% to 99.2% and decreased the frequency of patients referred to I.R, resulting in decreased cost of care for these patients. Although patient outcomes were not directly measured in this project, studies of ultrasound guidance have consistently demonstrated: decreased accidental arterial puncture, nerve damage, patient discomfort, patient exposure to iodine contrast and radiation, and reduced dependence on fluoroscopy. The results of this performance improvement project could be used by MONE members to conduct a cost benefit analysis at their institutions to determine the value of adopting ultrasound guidance.

- Robert Ferdinand, BSN, RN, CRNI, Spaulding Rehabilitation Hospital Network