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Applying the PDSA Framework to Examine the Use of the Clinical Nurse Leader to Evaluate Pressure Ulcer Reporting

CE 1.5 Contact Hours

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The clinical nurse leader (CNL) role has been cited as an effective strategy for improving care at the microsystem level. The purpose of this article is to describe the use of the CNL role in an academic medical center for evaluating pressure ulcer reporting. The Plan-Do-Study-Act cycle was used as the methodological framework for the study. The CNL assessment of pressure ulcers resulted in a 21% to 50% decrease in the number of hospital-acquired pressure ulcers reported in a 3-month time period. The CNL role has potential for improving the validity and reliability of pressure ulcer reporting. **Key words:** *clinical nurse leader*, *hospital-acquired pressure ulcer*, *pressure ulcer reporting*, *quality improvement*

WITHIN a changing health care environment, the challenge to improve patient care processes and clinical outcomes is daunting. Organizations are inundated with performance requirements related to process and outcome measures in almost every aspect of care. Programs such as the Hospital Inpatient Quality Reporting Program,[1] Value Based Purchasing,[2] and The Joint Commission Core Measures[3] created through regulation and federal legislation are concerns for every health care organization in the country. The ultimate goal of these programs is to challenge health care organizations to meet

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the Institute of Medicine's[4] aims for quality, including safe, timely, effective, efficient, equitable, and patient-centered care, and to ensure evidence informed practice.

There are specific organizational requirements that impact the delivery of nursing care. The American Nurses Credentialing Center with Magnet[5] and the National Database for Nursing Quality Indicators,[6] a nursing database managed by Press Ganey, track and monitor nursing-sensitive measures and patient care outcomes such as falls, pressure ulcers, restraints, and infections. Measurement of these outcomes is used to reflect the quality of nursing care.

Pressure ulcers are a significant adverse event or hospital-acquired condition (HAC)[7] and most often deemed preventable. Nursing care is the cornerstone to pressure ulcer reduction and prevention. The incidence of hospital-acquired pressure ulcers (HAPUs) within the acute care inpatient setting has been reported to be 2.9%,[8] and the average hospital cost of treating stage IV pressure ulcers and resulting complications is estimated to be approximately $129 248 for 1 hospital admission.[9] The financial penalties associated with the development of an avoidable pressure ulcer, a pressure ulcer that is the result of negligent provider care, results in nonpayment of the additional cost of treating pressure ulcers for Medicare beneficiaries through the HAC program.[7] According to current research, making this situation more challenging, it has been estimated that 39.1% of HAPUs may be unavoidable; the more significant pressure ulcers, stages III and IV, may be underreported; and the level of harm generated from pressure ulcers is underestimated in the inpatient setting.[8,10] All of these data lend credence to the importance of valid and reliable HAPU data as a measure of the quality of care provided in an organization.

Organizations continue to seek out and implement interventions that will meet or exceed the requirements and improve patient care outcomes. Many strategies have been evaluated, but one intervention that may address a "strategic design" issue is related to changing the care delivery model. This solution considers putting the "right people" in the "right positions" to impact improvements. This may more broadly establish the grassroots for health care system change. This strategy requires finding the best balance of education and practice with a generalist focus and fine-tuned improvement skills that translate to application. The clinical nurse leader (CNL) is aptly positioned to perform this work.

The CNL is the first new role in nursing in more than 40 years proposed by the American Association of Colleges of Nursing (AACN)[11,12] in 2007. The emergence of the CNL was developed after numerous authors cited the need for developing innovative care delivery models that effectively leverage nurses. Both Shirey[13] and Kimball and colleagues[14] address the need for care delivery models that use the unique skills and abilities of nurses within a changing health care system. This calls for individuals who are educated to impact quality and safety at the microsystem level. CNLs are educated in analytic processes, improvement, and safety sciences.

The AACN specifically addresses the CNL role and the associated competencies for microsystem improvement through the following fundamental aspects of practice[11]: participation in identification and collection of care outcomes; accountability for evaluation and improvement of point-of-care outcomes, including the synthesis of data and other evidence to evaluate and achieve optimal outcomes; design and implementation of evidence-based practices; and team leadership, management, and collaboration with other health professions' team members. Bender and colleagues,[15-17] leading authors on the use of the CNL in the clinical setting, have published numerous articles supporting the AACN competencies and impact of the CNL on clinical outcomes, particularly at the microsystem level. In addition, Hix and colleagues[18] lend credence to the work by Bender and colleagues and support the impact of the CNL at the microsystem level.

For this study, the CNL role was supported by the literature as an intervention specific to improving care at the microsystem level. In this organization, the chief nursing officer was seeking to examine the use of the CNL role within the academic medical center, specifically within the nursing unit. There were also organizational opportunities to reduce pressure ulcers based on HAPU reporting at the nursing unit level. However, nursing unit leaders perceived the degree and extent of the pressure ulcer–reduction opportunities to be flawed. This provided the occasion for the organization to test the CNL role specifically for data discovery, for examining the validity and reliability of pressure ulcer measurement and reporting.

PURPOSE

The overall goal of the organization at the inception of this project was to evaluate the use of the CNL role within an academic medical center environment for improving quality and safety care coordination. However, a subgoal was to evaluate the perceived flaws associated with pressure ulcer reporting. Thus, this article focuses on the singular objective to evaluate pressure ulcer data collection and reporting and does not detail the other quality and safety metrics and processes evaluated during the CNL project. The clinical question guiding this aspect of the project was as follows: "How does the use of a CNL role in an intensive care unit (ICU) and a medical-surgical inpatient unit impact the identification and reporting of pressure ulcers within 90 days?"

This project was deemed an improvement design that is descriptive in nature and intended for discovery. The 90-day time frame did not allow for robust evaluation of sustainable outcomes; however, the review informed leadership as to the opportunities to improve pressure ulcer reporting, identification, and data collection processes.

METHODS

The setting for this study was an urban academic medical center in the southeastern United States. Institutional review board approval was not required.

Microsystem selection

For this improvement project, the microsystems identified for the intervention selected were an ICU and a medical-surgical unit. Units were selected on the basis of leadership willingness to participate and patient composition of the unit. For this pilot, the authors believed it necessary to include both the critical care and medical-surgical environments, as these microsystems have varying and unique processes and workflow. These units were selected because they have different performance improvement opportunities; however, both units had opportunities to decrease reported pressure ulcers.

Model for Improvement/PDSA

The Model for Improvement (MFI) 3 guiding questions and the Plan-Do-Study-Act (PDSA) small test of change engine[19,20] were used as the methodological framework for this project. The MFI is used for examining and implementing interventions for systems-based process improvement identified through a systematic process such as microsystem analysis.[21,22]

The initial question in the MFI is "What am I trying to accomplish?" In this situation, the organization sought to understand pressure ulcer reporting, identify opportunities to improve reporting, and compare CNL documentation of all stage pressure ulcers with nursing documentation of skin assessment descriptions. The second MFI question, "How will I know a change is an improvement?" was evaluated using organizational baseline HAPU reported data, comparing HAPU and community-acquired pressure ulcer counts from nursing documentation with CNL documentation obtained from a database developed specifically for this project. The final MFI question of "What changes can I implement that will result in an improvement" was the implementation of 2 CNL roles on 2 inpatient units within the organization, with a goal of evaluating pressure ulcer data and reporting.

CNL pilot and bundled rounding approach intervention

The CNL role was implemented and the PDSA cycle was initiated between May and July 2016. The 2 CNLs were assigned a variety of quality and safety-related responsibilities; however, specific to this project objective, one of the roles included the implementation of a "bundled rounding" process for skin assessment. "Bundled rounding" was a term used to describe the process of evaluating each patient for the evidence-informed practices for a group of nursing-sensitive quality measures. The term "bundled process measures" is used interchangeably to refer to this rounding process and the resulting measures that were evaluated. For the evaluation of pressure ulcers, the "bundled" approach was specific to practices used in the organization that are associated with the prevention or management of pressure ulcers.

The CNLs were initially tasked with building expertise in skin assessment and patient rounding to assess for evidence-informed bundle practices. The CNLs used the time spent in the patient rounds to evaluate and collect data related to both process and outcome measures relevant for skin assessment. Interrater reliability (IRR) was established for the CNL documentation by the wound, ostomy, and continence nurse (WOCN) team, and comparison assessments were documented in a database for both providers. Bedside nursing documentation was also available from the organization's electronic health record (EHR). The organization currently uses a 6-stage pressure ulcer staging system defined by the National Pressure Ulcer Advisory Panel.[23] This standardized process was used by the staff nurse for the documentation of the skin assessment descriptions, as well as for the CNL and WOCN skin assessments and assignment of pressure ulcers.

Data collection and data analysis

Bundled process measures were captured on a Microsoft Excel spreadsheet (see Supplemental Digital Content, Figure 1, available at: http://links.lww.com/JNCQ/A318) that the CNLs created, which was located on the mobile workstation. The elements of the bundle were collected using "Yes/No/NA" responses. All of this information was collected on the daily rounds for each patient in each unit by the CNLs and evaluated by them. Within the Excel file, formulas were built to evaluate skin-related bundled care adherence. In addition to the Excel spreadsheet, a Microsoft Access database (see Supplemental Digital Content, Figure 2, available at: http://links.lww.com/JNCQ/A319) was developed to collect the pilot information. The Access database included the CNL's skin assessment and the IRR data from the WOCN. Pressure ulcer reports were developed from these 2 data sources, the Excel spreadsheet and CNL Access database. The Supplemental Digital Content, Figures 1 and 2 (available at http://links.lww.com/JNCQ/A318 and http://links.lww.com/JNCQ/A319), provides a listing of the variables collected in each data source.

An organizational HAPU report was already in existence based on data obtained from nursing documentation in the EHR. Data from this report included a description of the skin assessment by the staff nurse. The nursing description of the skin assessment was mapped to a corresponding pressure ulcer stage, with the location/site of each potential pressure ulcer. This HAPU report was used as the baseline data for pressure ulcer reporting for the organization. The HAPU report and CNL Access database provided the 2 sources for comparing nursing documentation of described skin assessment entries that were mapped to a pressure ulcer stage.

Outcome variation in reporting was determined by comparing the CNL pressure ulcer assessment with the nursing documentation in the EHR. There were 3 types of data in these data sets: matching records, records found only in the CNL database, and records found only in the nursing documentation. Matching records were those in which the CNL database and nursing documentation in the EHR

identified common patients. Common patients may or may not have resulted in matching counts of pressure ulcers or locations. Records found only in the CNL database were pressure ulcers not identified or not documented by the staff nurses. Records found only in the nursing documentation were the opposite of the previous data where the staff nurses identified varied counts and types of pressure ulcers that were not identified by the CNL. Supplemental Digital Content, Figure 3 (available at: http://links.lww.com/JNCQ/A320), depicts these data outputs.

RESULTS

Using data obtained from June and July 2016, the counts of pressure ulcers from the CNL Access database for matching records were evaluated. Data for the month of May 2016 were not used in the analysis because of necessary training and orientation for the new CNLs. During the month of May, data were potentially skewed while data collection processes were being developed and revised by the CNLs. In the months of June and July 2016, the CNLs documented 13 fewer HAPUs, which is an approximately 33% decrease in the count of this type of pressure ulcer compared with information documented by the staff nurses. They also identified 8 or 27% additional pressure ulcers present on admission (Table). In cases in which the nursing documentation in the EHR identified HAPUs not in the CNL database, cases were reviewed by the CNLs, and the majority of variances occurred because of misidentification by the staff nurse (eg, skin tears, abrasions, or even dermatitis).

If the patient had a pressure ulcer, the CNL documented the presence of the evidence-informed bundle elements used by the organization (dressings if applicable, appropriate bedding, and heel protectors) that were in place or if there were missing bundle elements. In analysis from these data, 13 (33%) patients with a pressure ulcer had some element of the bundle "missing" or not completed and 26 (67%) patients with a pressure ulcer met all the defined organizational bundle elements.

The cost of the project was deemed minimal in comparison with the projected impact for improving reporting of pressure ulcers, providing bedside coaching and mentoring for more accurate skin assessment in the future, and limiting wasted resources for interventions based on data discrepancies. The salary costs associated with the project were the salaries of the 2 CNL roles for the pilot and the salaries for the 2 staff roles vacated by the CNLs for the 90-day duration of the project. There were minimal supply costs, primarily the assignment of a pager for one of the CNLs who did not previously have this resource. Both CNLs were currently employed by the organization, so there were no costs associated with training about organizational processes, technology, and equipment.

Table. Comparison of CNL and Staff Nurse Documentation

	Hospital-Acquired Pressure Ulcers			Community-Acquired Pressure Ulcers		
Month	CNL Document, n	Staff Nurse Document, n	% Variation CNL	CNL Document, n	Staff Nurse Document, n	% Variation CNL
Jun 2016	19	24	21	11	10	10
Jul 2016	8	16	50	27	20	35
Total	27	40	33	38	30	27

Abbreviation: CNL, clinical nurse leader.

DISCUSSION

On review of the PDSA outcomes, the authors found that the results support the effectiveness of the CNL role in identifying opportunities associated with pressure ulcer reporting in this organization. As a result of data collected by the CNL, there was a deeper understanding of the process and outcome data associated with pressure ulcers. Opportunities uncovered in the process and outcome data warrant workflow and system revisions to produce more accurate reporting of pressure ulcers.

Specific to the documentation of pressure ulcers, the skin assessment reported in the EHR was found to vary in both validity and reliability when compared with that of the CNL in the Access database. The CNL documentation over the course of the pilot consistently resulted in a decreased number of HAPUs and with slightly more or equivalent reporting of community-acquired ulcers when compared with the EHR nursing documentation.

A portion of the pressure ulcer reporting variation was deemed to be a technical functionality limitation in the ability to delineate a modified skin assessment in the nursing documentation when an error in reporting had been intentionally revised to reflect more accurate information. For example, if a staff nurse had assessed a wound and determined a potential pressure ulcer, but after consultation, the WOCN found that the wound was a vascular ulcer, the documentation would be revised to reflect the more accurate assessment. If staff nurses discontinued the skin assessment documentation or recorded "in error" on the EHR, the wounds were still attributed to the unit in the organizational HAPU report.

In the current functionality of the EHR system, it was difficult to determine whether the documented pressure ulcer was true or false due to the system functionality in the EHR for deactivation of documentation postdischarge. This finding was found to promote greater understanding of the reported data in the organization and a call to action by the organization to improve the functionality of the technology and documentation capabilities within nursing documentation. Workflow revisions are being established to provide a flag for the identification of modified or revised skin assessment documentation. When the WOCN provides consultation, a data field within the nursing documentation has been provided to update the skin assessment should changes need to occur. This will allow the report programmer to modify the organization HAPU report to reflect more accurate information.

The most common source of the variation in skin assessment was due to misidentification of the type of wound and the description of the skin assessment by the staff nurse. This revelation was not deemed a negative outcome for the project, as one of the limiting factors prior to this implementation was lack of the ability to provide information on skin assessment inaccuracies for bedside teaching and mentoring. For example, until this pilot was initiated, there was no method to compare the skin assessment of a more skilled evaluator with the descriptions provided by the bedside staff nurse. As previously stated, the WOCNs consult only on higher-stage pressure ulcers (stage III and above) and therefore prior to this project, the ability to review all perceived skin assessment opportunities were unavailable. The ability of the CNL to provide real-time skin assessment feedback to a more novice nurse was deemed a positive outcome for the project due to the high volume of new graduate nurses who are employed by the organization. The CNL coaching and mentoring were also believed by the authors to promote a more collegial interaction versus an apprehensive response that may result from feedback from other unit leadership.

The CNLs performed analysis of the unit pressure ulcer information and then identified unit trends and educated staff where appropriate through all-staff meetings or using other staff communication functions such as bulletin boards. This also allowed them to uncover the source of many special circumstance pressure ulcers in the ICU, including device-related ulcers, bariatric-related ulcers, and those caused by certain anatomic

situations. A list was created of these instances and used to educate the nursing staff on prevention and treatment.

The CNLs were able to identify the opportunities to improve evidence-informed practice implementation on the unit based on the data collection established through the bundled rounding process. A nurse manager was able to view opportunities where the CNL evaluated a patient with a confirmed pressure ulcer. Each instance that the patient with the pressure ulcer was evaluated by the CNL provided an opportunity to validate that the appropriate pressure ulcer treatment or bundled measures were being used. The variations identified were not used in a punitive fashion but instead to understand process or system failures.

Data obtained by the CNLs highlighted the utility of a unit-based skin champion. There is a need to ensure that there are skin experts available on each unit and also to expand the reach and capacity of the WOCNs. The organization is also evaluating tele-nursing technology to enhance communication with the WOCN team and has already added additional staffing resources to increase the number of WOCNs available to the nursing units.

The project has highlighted the importance of a dedicated role within the nursing microsystem for improvement activities. The training and education of the CNL create a nurse leader uniquely qualified to advance improvement at point of care, distinct and separate from nursing managers, assistant managers, and nurse educators. Within a complex health care system, there should be a role dedicated to improving care at the microsystem level. While all providers have a role in ensuring quality outcomes, the CNL is poised and capable of leading the improvement charge.

This project has several limitations. The pilot included only 2 units, and the time frame was limited to 90 days. At this time, the authors cannot provide information on the sustainability of the results identified. In addition, the pilot provided the CNLs with the opportunity to evaluate an ideal situation; in this case, a dedicated position focused on pressure ulcer data collection and reporting. After the initial PDSA cycle, the CNL role has evolved to a broader, more encompassing view of patient care and the system of care for each unit, which may have a varying impact on outcome reporting. In addition, this organization is a large, academic medical center with the capacity to shift resources to test an improvement intervention. Filling staff nursing roles that were vacated by the CNL during the pilot was available to cover the pilot project, and funding was possible through an administrative budget that did not impact patient care efforts.

An opportunity from the project that should be addressed is related to data analytics. Data necessary to evaluate the outcomes using statistical methods other than descriptive statistics were not available. Because of the short duration of the pilot PDSA intervention, there were insufficient data points necessary to produce appropriate statistical process control to evaluate the implementation over time. Parametric procedures such as the use of the *t* test to evaluate a statistically significant difference in outcomes should be a future addition of the evaluation of the outcomes specific to pressure ulcer analysis, in addition to statistical process control.

CONCLUSIONS

This project exemplifies the complexity of accurate pressure ulcer reporting and need for focused attention at the point of care for accurate assessment and documentation of skin status. Following the implementation of a 90-day PDSA intervention using the CNL role to examine pressure ulcer reporting, the authors support that the CNL role has a direct impact on improving quality at the microsystem level. The CNL was found to identify gaps in the validity and reliability of pressure ulcer reporting, as well as opportunities to improve compliance with bundle of care processes for pressure ulcer management and prevention. Organizations are challenged to review their processes for data collection and reporting to ensure they are achieving the most accurate information for actionable improvement.

The results of the project support the expanded use of the CNL role for improving processes and outcomes within an organizational nursing care delivery model. The sustainability of the project over time will need to be established. However, nursing leadership within this organization believe that there is a role for the CNL but that the role should be implemented in phases, identifying the best balance between the intraprofessional roles that currently exist.

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